Terex Operation Manual
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Outline of Operation

The Greer Element system is designed for use as an aid to crane operation.

Do not use this system without 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 Greer Element, hereinafter referred to as the system. Please read the instructions contained in this manual.

System Components

- Display Unit
- Computer Unit
- Pressure Sensors
- Reeling Drum Assembly, with Extension and Angle Sensors
- Anti-Two-Block Switches
- Cables
- Audible Alarm
- Installation/Operator Manuals

Display Unit

The display unit provides the operator with:

- Rated Capacity
- Actual Load
- Bar graph representation of Actual Load vs. Rated Capacity
- Radius of the Load
- Boom Angle
- Main Boom Length
- Working Area
- Crane Configuration
- Frame-Level Screen

REELING DRUM ASSEMBLY

The reeling drum assembly consists of the reeling drum and reeling drum cable, the boom angle sensor, and the extension sensor.
PRESSURE SENSORS
There are two pressure sensors which measure pressure in the boom hoist cylinder. One sensor measures the rod-side pressure and one sensor measures the piston-side pressure. The pressure sensors are located in the computer unit.

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 opens the switch. The resultant signal is sent to the computer via the reeling drum causing an ATB alarm and function kick-out to occur.

FUNCTION KICK-OUT
Electrically-operated hydraulic solenoids disable the functions for boom hoist lower, telescope out, and winch up when an overload or ATB alarm condition occurs.

OPERATOR PROGRAMMABLE ALARMS
These alarms, when properly set by the operator, define the operating range. These alarms are programmable for each job site and allow the operator to work in a defined area.

- Minimum Boom Angle Alarm
- Maximum Boom Angle Alarm
- Maximum Boom Length Alarm
- Maximum Tip Height Alarm
- Left and Right Swing Alarm
- Work Area Alarm

OUTRIGGER POSITION SENSING
This alarm alerts the operator, audibly and visually, when the selected outrigger position does not match the detected outrigger position.

ELECTRONIC FRAME-LEVEL SENSOR (IF EQUIPPED)
This sensor and display screen, show the crane's position on the X-axis and Y-axis relative to 0.0°.
Power On Self-Test

NOTE: Display message is crane dependent. This is only an example.

Immediately following electrical power up or following operation of the TEST button, the system executes a self-test which lasts for five seconds.

During this time the numerical display segments and bar graph segments are all turned on, the audible alarm will sound an alarm indicator lights are illuminated.

Start Up Screen

Immediately following the power up self-test, the display will show as above. During this time, the crane is disabled by the system function kick-out. Press the “Press to Continue” button to acknowledge the home display message and allow the system to start normal operation.
System Setup – Frame-Level Screen (If Equipped)

If the machine is equipped with a frame-level, press the circled button to access the frame-level screen. This option will not appear on machines without a frame-level installed.

Use the frame-level screen to ensure the machine is properly leveled.

<table>
<thead>
<tr>
<th>Machine angle from level</th>
<th>Dot Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°-0.9° on either axis</td>
<td>Green</td>
</tr>
<tr>
<td>1°-2° on either axis</td>
<td>Yellow</td>
</tr>
<tr>
<td>2°+ on either axis</td>
<td>Red</td>
</tr>
</tbody>
</table>
If the frame-level, or its connection, malfunctions the home screen will show the icons in red.

The grid on the frame-level screen will also display in red.

To exit the screen, press the "Home" button in the lower left corner.
Accessing the Configuration Display

**NOTE:** Access the configuration display by pressing the configuration button as shown.

The system will remember all data previously set. When removing power to the system, and re-powering, the settings remain intact until reset by the operator.

After the configuration has been set, the operator must choose the winch is in use. Changing the winch will automatically change the lifting point and the parts of line to the values previously set for the selected winch.

**NOTE:** Always check the point of lift and parts of line following selection of the winch.

**WARNING!**

THE DISPLAYED LOAD AND CAPACITY ARE BASED UPON THE CURRENT SELECTED POINT OF LIFT. NEITHER THE GREER ELEMENT SYSTEM, NOR THE CRANE CAPACITY CHART ALLOWS FOR LIFTING FROM MORE THAN ONE HOOK AT A TIME.
The **CONFIGURATION** display represents the current setup of the system with green indicators. Each area contains a group of one or more green indicators and button to change the setup selection.

Once the application is selected, press the home button to display the operations of the configuration.

1. The **Outrigger** button contains three green indicators. They indicate full, intermediate, or retracted outriggers. Choose the outrigger selection from the configuration display.
Outrigger Position Sensing (If Equipped)

The operator will be warned if the selected outrigger position does not match the detected outrigger position.

**Correct Selection:** The selection will have a solid green indicator, when the selected and detected outrigger positions match.

**Incorrect Selection:** The detected position will flash a red indicator and the selected position will be a solid yellow indicator. On the main screen, an audible alarm will sound if the selected position is greater than the detected position. The alarm will sound if the operator has selected fully extended outriggers, but the outriggers are in the intermediate or fully retracted position.

2. The **Platform** button enables the optional Personnel Platform.

3. The **Home** button is selected to display the operations of the configuration selected.

4. The **Pick** button contains three green indicators. A single green indicator will illuminate to show the point of lift. Press the “Pick” button to scroll through the available options.
5. The **POL** button displays the current selection of the parts of line. Press the “Increase” or “Decrease” button to change the parts of line. When finished, press “Exit”.
6. The **Aux Head** contains one green indicator that will illuminate when the aux head is fitted.

![Aux Head Diagram]

7. The **Jib** group contains 6 green indicators. They indicate the length and offset of the jib in use. Press the “Jib” button to access the different options.

![Jib Options]

- 32' TELE JIB 0
- 32' TELE JIB 15
- 32' TELE JIB 30

Next >
8. The **Boom Mode** group contains one green indicator for machines with pinned extensions or active boom tip options. Choose the boom mode in use.

9. The **Stow (Stowed Jib)** group indicator illuminates when the jib is stowed on the boom.
10. The **Counter Weight** group contains one green indicator. It is only active on machines equipped with counterweight options.

11. The **Winch** group contains two green indicators, which indicate the front or rear winch. The winch selection may be made in either the configuration display or the home display.

    **NOTE:** If the crane is equipped with two winches, always select the winch to be used for the lift prior to the point of lift and parts of line.
12. The **Tires** group contains one green indicator. Press the tire button to access the tire selection screen. Choose the correct setting to be used. For machines with more than one tire option, it is important the operator selects the tire configuration for the tire chart used.

Select **RIGGING/TRAVEL** mode when the machine is in the rigging process or is a rough terrain crane traveling between jobs. When in **RIGGING/TRAVEL** mode all other functions are disabled.
1. The **Brightness** button is selected to adjust the display setting. Press the button to bring up the adjustment screen.
2. The **Information** button displays system generated messages regarding the software versions of the equipment and fault codes. When the information button is pressed, the data will display as long as the button is held.

3. The **Actual Load** display shows total load. This includes the load, slings, etc. which are suspended below the lifting point. **NOTE:** The system load reading is most accurate in static situations. Due to system dynamic response, the load reading may vary when lifting or lower the load. Meter functions carefully, especially boom down to minimize the dynamic effects.

4. The **Parts of Line** is adjustable from the Configuration Display.
5. The **Pre-Alarm Indicator** (Yellow) illuminates at a preset value of 90% or rated capacity to provide a visual indication of approach to overload.

![Pre-Alarm Indicator Image]

6. The **Overload Indicator** (Red) illuminates at a preset value of 100% of rated capacity to provide a visual indication of maximum allowed load.

![Overload Indicator Image]

7. The **Bar Graph** indicates the actual load relative to maximum rated capacity.

![Bar Graph Image]

8. The **Rated Capacity** display shows the maximum rated capacity of the machine in the current configuration.

![Rated Capacity Display Image]
9. The **Anti-Two-Block** indicator illuminates when the ATB limit switch detects a two-block condition.

10. The **Length** display shows the length of the main boom; from the foot pin to the sheave pin of the main boom head. The system can display in metric or imperial units.

11. The **Angle** display indicates, in degrees, the angle of the main boom relative to horizontal.
12. The **Radius** display shows the radius of the load.

13. The **Operator Alarm** icon is illuminated when the operator alarms have been set.

14. The **Winch** button is selected to choose either the front or rear winch.

15. Press the **Configuration** button to return to the Configuration display screen.
Cancel Alarm Button

The **CANCEL ALARM** button is used to silence the audible alarm. Pressing the button once will cancel an audible alarm caused by an:

- Overload
- ATB Alarm
- Operator Programmable Alarm
- Outrigger Horizontal Position Match

The audible alarm remains cancelled until the condition which caused the alarm has been resolved.

**Reset Function Kickout**

When rigging the machine, it may be necessary to place the boom in a position that could cause a function kick-out (FKO). In this situation, it is necessary to use the bypass (cancel alarm button).

Press and hold the cancel alarm button for approximately 5 seconds to reset the relay. A second beep will confirm the bypass. When the condition which caused the FKO is no longer present, the function disconnect relay will reset to the normal condition. If a different alarm condition occurs while the relay is over-ridden, the new alarm condition will cause another FKO.

**WARNING!**

**WHEN THE FUNCTION DISCONNECT RELAY IS RESET USING THE CANCEL ALARM BUTTON, THERE IS NO LONGER PROTECTION AGAINST THE CONDITION THAT CAUSED THE FUNCTION KICK-OUT.**
Operator Programmable Alarms

Accessing the Operator Alarms

Press the operator alarm button from the main working screen to access the operator alarms. The information screen will show the current status of the operator alarms.

There are four buttons to the left and right of the information window. Each button relates to the indicated alarm. In addition, each operates as a toggle switch. If the alarm to be set is OFF, press the button to turn the alarm ON. If the alarm to be set is ON, press the button to turn the alarm OFF.

When the operator alarms are set, the alarm set icon will appear.
Operator Programmable Alarms

1. Move the boom to the desired minimum angle, in this example, 23.0°.
2. Press the operator alarm button to access the operator alarm screen.
3. Press the “MIN ANGLE” button. In this example, the display will read “MIN ANGLE 23.0”.
4. The red warning light will flash and the alarm will sound when the boom angle is below 23.0°.
5. Press the “MIN ANGLE” button to cancel the alarm. The display will read “MIN ANGLE OFF”.

Setting Maximum Boom Angle Alarm

1. Move the boom to the desired maximum angle, in this example 67.6°.
2. Press the operator alarm button to access the operator alarm screen.
3. Press the “MAX ANGLE” button. In this example the display will read “MAX ANGLE 67.6”.
4. The red warning light will flash and the alarm will sound whenever the boom angle is above 67.6°.
5. Press the “MAX ANGLE” button to cancel the alarm. The display will read “MAX ANGLE OFF”.

Setting Maximum Boom Length Alarm

1. Move the boom to the desired maximum length, in this example 81.1 ft.
2. Press the operator alarm button to access the operator alarm screen.
3. Press the “MAX LENGTH” button. In this example the display will read “MAX LENGTH 81.1”.
4. The red warning light will flash and the alarm will sound whenever the boom length exceeds 81.1 ft.
5. Press the “MAX LENGTH” button to cancel the alarm. The display will read “MAX LENGTH OFF”.

Operator Programmable Alarms
Operator Programmable Alarms

Setting Maximum Tip Height Alarm

1. Move the boom tip to the desired maximum height, in this example, 80.3 ft.
2. Press the operator alarm button to access the operator alarm screen.
3. Press the “MAX HEIGHT” button. In this example the display will read “MAX HEIGHT 80.3”.
4. The red warning light will flash and the alarm will sound whenever the boom tip height exceeds 80.3 ft.
5. Press the “MAX HEIGHT” button to cancel the alarm. The display will read “MAX HEIGHT OFF”.

MIN ANGLE OFF  MAX ANGLE OFF
MAX LENGTH OFF  MAX HEIGHT 80.3
Operator Programmable Alarms

Swing Alarms

These alarms permit the operator to define a Working Arc and an Exclusion Zone by two set points. The following diagram illustrates the Working Arc and Exclusion Zone.

A left swing alarm is activated when swinging to the left.

A right swing alarm is activated when swinging to the right.

In this example the working arc is the smaller piece of the pie.

A left swing alarm is activated when swinging to the left.

A right swing alarm is activated when swinging to the right.

In this example the working arc is the larger piece of the pie.

WARNING!

THE OPERATOR DEFINED SWING ALARM IS A WARNING DEVICE. ALL FUNCTIONS REMAIN OPERATIONAL WHEN ENTERING THE OPERATOR DEFINED EXCLUSION ZONE. IT IS THE RESPONSIBILITY OF THE OPERATOR TO SET SWING ALARMS THAT ENSURE THE CRANES BOOM, ATTACHMENT, LOAD, RIGGING, ETC. MAINTAIN A SAFE WORKING DISTANCE FROM THE OBSTACLE. AVOID POSITIONING THE BOOM, ATTACHMENT, LOAD, RIGGING ETC. IN THE EXCLUSION ZONE WHEN MOVING TO THE LEFT AND RIGHT SWING POINTS. WHEN SELECTING LEFT AND RIGHT SWING POINTS ENSURE THE LOAD WILL MAINTAIN A SAFE DISTANCE FROM THE OBSTACLE. RESET THE SWING ALARMS IF THE CRANE OR OBSTACLE IS MOVED OR IF A DIFFERENT SIZE LOAD IS LIFTED.
Operator Programmable Alarms

Accessing the Swing and Work Area Alarms

Access the swing and work area alarms from the main working screen by pressing the operator alarm button twice.

The information screen will show the current status of the swing and work area alarms. There are four buttons, one for each alarm.

Each button operates as a toggle switch.

- If the alarm is OFF, pressing the button will turn the alarm ON.
- If the alarm is ON, pressing the button will turn the alarm OFF.
- When Operator Alarms are set the icon will appear.
- Return to the main screen by pressing the “OPERATOR ALARM” button.

Setting the Swing Alarms

**NOTE:** The Left and Right Swing Alarms must be set for the alarm to operate correctly. The red warning indicator will flash and the alarm will sound whenever only one of the swing limits is set.

1. Swing the boom to the desired left swing limit, for example, 325°.
2. Press the operator alarm button twice to access the swing alarm screen.
3. Press the “LEFT SWING” button. The display will read “LEFT SWING 325°”.
4. Move the boom to the desired right swing limit, for example, 35°.
5. Press the “RIGHT SWING” button. The display will read “RIGHT SWING 35°”.

The red warning indicator will flash and the alarm will sound whenever the boom swings past the preset limits. Pressing the “LEFT SWING” and “RIGHT SWING” buttons again will cancel the alarm and the display will read “LEFT SWING OFF” “RIGHT SWING OFF”.
Operator Programmable Alarm

Work Area Selection Mode

This alarm permits the operator to define an Operating Zone by only two set points. The use of this method of results in an enhanced working area and defines the Exclusion Zone area more simply. The following diagram illustrates the Operating Zone and the Exclusion Zone.

The operator defined work area alarm will define an imaginary vertical plane between two set points. When passing the plane the red warning lamp will illuminate, the alarm will sound and the message “EXCLUSION ZONE” will flash on the display.

WARNING!

THE OPERATOR DEFINED WORK AREA ALARM IS A WARNING DEVICE. ALL FUNCTIONS REMAIN OPERATIONAL WHEN ENTERING THE OPERATOR DEFINED EXCLUSION ZONE. “SAFE WORKING DISTANCE” IS THE TIME IT WOULD TAKE AN OPERATOR TO REACT TO AN ALARM AND FOR THE MACHINE MOTION TO BE HALTED BEFORE ENTERING THE EXCLUSION ZONE. IT IS THE RESPONSIBILITY OF THE OPERATOR TO SET POINTS THAT ENSURE THAT THE CRANES BOOM, ATTACHMENT, LOAD, RIGGING ETC. MAINTAINS A SAFE WORKING DISTANCE FROM THE OBSTACLE.

Do not position the boom, attachment, load, rigging etc. in the Exclusion Zone when moving to Set Points 1 and 2. When selecting the Left Points and Right Point, ensure the load will maintain a safe distance from the obstacle. Reset the work area alarm, if the crane or obstacle is moved, or if a different size load is lifted.
Operator Programmable Alarms

Setting the Work Area Alarm

1. Press the operator alarm button twice to access the Work Area alarm screen.
2. Move the boom, attachment, load, rigging etc. to the desired LEFT SET POINT.
3. Press the “Left Point” button. The display will read LEFT POINT SET.

**NOTE:** The Left and Right Points must be set for the system to operate correctly. The red warning light (item 3) will flash and the audible alarm will sound whenever only one of the left/right swing limits is set.

4. Move the boom, attachment, load, rigging etc. to the desired RIGHT SET POINT.
5. Press the “Right Point” button. The display will read RIGHT POINT SET.
6. The red warning light will flash and the audible alarm will sound whenever the boom tip penetrates the exclusion zone.
7. Pressing the LEFT POINT and RIGHT POINT buttons again will cancel the alarm and the display will read LEFT POINT OFF RIGHT POINT OFF.
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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.

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