

Faria[®]

**MARINE
INSTRUMENTS**



Owners's Manual

MG2000[™]

Tachometer

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Index

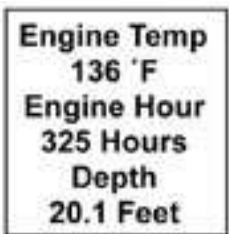
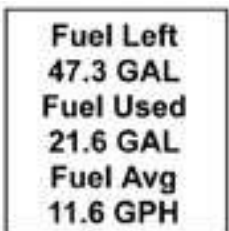
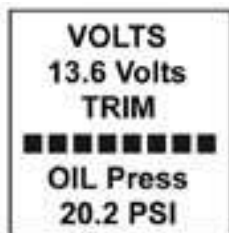
Figure 1 Default screens	page 1
Description	page 1
Normal Mode	page 2
Contrast and Lighting	page 2
Displayed Functions	page 3
Default screen 1	page 3
Default screen 2	page 3
Default screen 3	page 3
Default screen 4	page 4
Figure 2 Screen Sequence	page 4
Figure 3 LCD Display Screens	page 5
Fuel Functions	page 6
Fuel Level Sender	page 6
Manual settings	page 6
Edit Mode	page 7
Functions that are adjusted in Edit Mode.	page 7
Instructions	page 7
Select Default Screen	page 7
Reset Fuel Used	page 8
Set Fuel Tank Full	page 8
Set Amount of Fuel	page 8
Organize User Screens	page 9
Select Gauge Range	page 10
Select Tachometer Dial	page 10
Select Oil Pressure Dial	page 10
Select Coolant Temp Dial	page 11
Select Fuel Sender	page 11
Calibrate Trim Sender	page 11
Select Display Units	page 12
Select Pressure Units	page 12
Select Volume Units	page 13
Select Temperature Units	page 13
Select Depth Units	page 13
Select Fuel Tank Size	page 13
Manual Entry Screens	page 14
Fuel Tank Calibration	page 15
Low Fuel Alarm	page 15
Software ID and Revision	page 15
Depth Sounder Warnings	page 16
Select Self Test	page 16
Alarm Mode	page 17
Low Fuel	page 17
Engine Warnings	page 18
Alarm Messages From ECU	page 18

Volvo MG2000™

Tachometer Manual

FARIA MG2000™ tachometer combines the features of an ECU serial bus gateway and several instruments into one unit:

- The tachometer is analog in appearance but is driven by a stepper motor for digital accuracy.
- The high resolution LCD screen displays information for many other functions and the various “screens” can be configured as the user wishes. As received, the screens are configured as shown in Figure 1.



Description

The MG2000™ tachometer receives digital engine data from the Engine Control Unit (ECU) via the Volvo SAE J1708/J1587 bus and can receive GPS information via a NMEA 0183 connection to a suitable GPS unit. GPS information is displayed in the MG2000™ speedometer. Analog inputs are provided for two non-engine sensors; fuel level and trim position. A direct pressure port allows monitoring of engine water pressure.

The MG2000™ provides a Faria Bus output to allow use of various 5, 4, and 2 inch instruments with the MG2000™.

The Faria MG2000™ tachometer will turn on when the ignition key is turned on and will turn off when the ignition key is turned off. The unit will power up showing the last screen selected by the user prior to shut off. The default screens are shown in Figure 1.

The instrument has three push buttons; “M” (Mode), “DOWN”, and “UP”; that control the functions available. The “M” (Mode) button is used to change the function of the LCD display and to access submenus and adjustable settings. The “DOWN” and “UP” buttons are used to modify the settings.



In “NORMAL” operation mode, pressing the “Mode” button and then pressing “DOWN” or “UP” causes the display to cycle between the available screens (see Figure 2).



Figure 1

Press the “Mode” button to exit the “screen selection mode” and return to normal mode or do not push any buttons for 4 seconds and the current screen will stay selected and the unit will return to normal mode (see Figure 3).

In “NORMAL” operation mode, press the “Mode” and “UP” buttons to change to the “EDIT” menus (see Figure 3 and EDIT mode below).



When the “Edit” menus have been selected, press the “Mode” button to return to normal mode.



Press the “DOWN” or “UP” buttons to cycle between the available “Edit” functions.

Press and hold the “DOWN” and “UP” buttons for two (2) seconds to select an “Edit” function to change. Within each “editing” function the “DOWN” or “UP” buttons select settings or sub-functions.



Follow the instructions in the “Edit” mode section of this manual to save the new settings after you select / adjust them.

Normal Mode

When the MG2000™ is turned on, the unit enters “Self Test” mode. The screen will display “The Self Test Mode Is In Operation” for 10 sec. The horn will sound once, the warning lights and back lights will flash.

When this is complete, the software Id and revision screen will show for two seconds, then the user selected “Default” screen will appear. The information below applies to the MG2000™ as received with no user changes to the screen selections. When the unit is turned on, the lighting defaults to off.

Contrast and Lighting

In the “NORMAL” operating mode the instrument LCD contrast can be adjusted by pressing either the “UP” or “DOWN” buttons.



This adjustment is helpful as lighting conditions and viewing angles change.

To adjust the lighting level intensity of all instruments in the system, both the “UP” and “DOWN” buttons must be held for three seconds.



The lighting intensity of all instruments can now be adjusted by pressing the “DOWN” or “UP” buttons.

Return to “NORMAL” mode by pressing and holding both the “UP” and “DOWN”

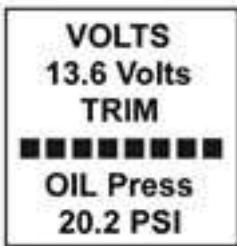
buttons.



Displayed Functions MG2000™ Tachometer

The tachometer is a digital instrument with the appearance of an analog instrument. The tachometer receives data directly from the ECU so no settings are normally required. The setting for the tachometer dial range can be changed in the “Edit” menu (see below). A microprocessor controlled stepper motor moves the pointer to display engine revolutions per minute.

Screen “1”



Volts

Displays system voltage as received from the ECU

Trim

Displays setting of the trim sender as received from the ECU.

Oil Press

Displays Oil pressure as received from the ECU. Pressure dial range can be selected in “Edit” Mode.

Screen “2”



Fuel Left

Displays the amount of fuel left based on the amount the operator entered in tank as set in the EDIT mode.

For this function to work correctly, the following settings MUST be set by the operator in the EDIT function: “Fuel Tank Size”; and “Fuel Tank Full” OR “Amount of Fuel”. The default “Fuel Tank Size” is 0. The operator must set the Fuel Tank Size as described in the Edit section of this manual.

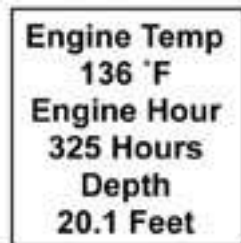
Fuel Used

Displays the amount of fuel used since last reset based on the GPH from the engine ECU and the time spent at each GPH.

Fuel Avg

Displays the average GPH since last reset based on the GPH from the engine ECU and the time spent at each GPH.

Screen “3”



Engine Temp

Displays the coolant temperature received from the ECU. Dial range can be selected in the “Edit” function.

Engine Hour

Displays the Engine Hours data received from the engine ECU.

Depth

Displays the depth sounder data (if installed and on the engine bus) received from the engine ECU.

Screen "4"



This screen displays fault conditions based on engine data received from the ECU or alarms based on internally set alarm points. Engine alarms from the ECU will be displayed as "Check Engine !" or "Engine Emergency Stop !". Accessing the "View" mode when the Alarm screen appears will allow more information to be displayed about the alarm, if provided by the engine.

Internal alarm values can be set for "Low Fuel" and other functions. Alarms for these settings will appear as required.

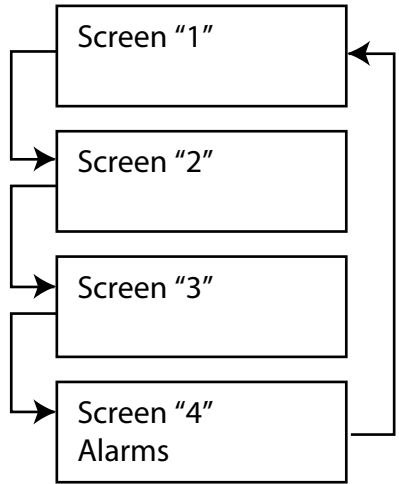


Figure 2

LCD Display Screens:

In the "NORMAL" mode, press "Mode" once to enter screen "Select" mode,



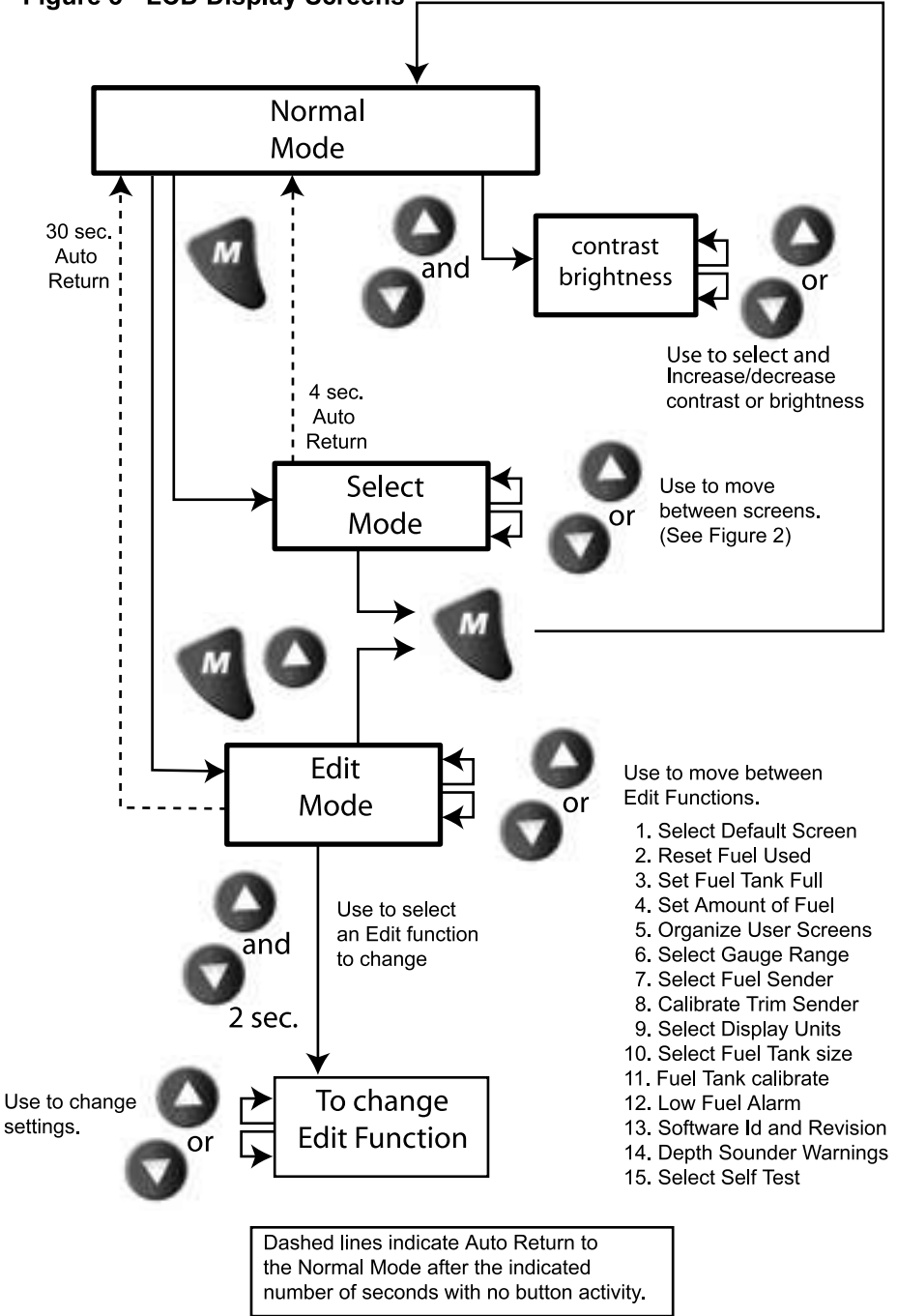
press "UP" or "Down" to move between screens.

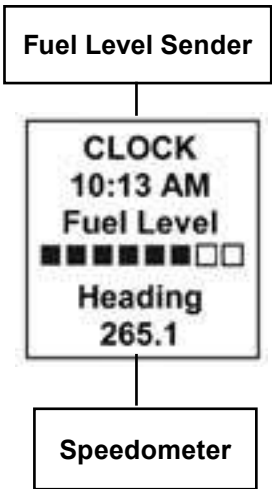


Press "Mode" once to return to "NORMAL" mode.



Figure 3 - LCD Display Screens





Fuel Functions

Fuel Level Sender

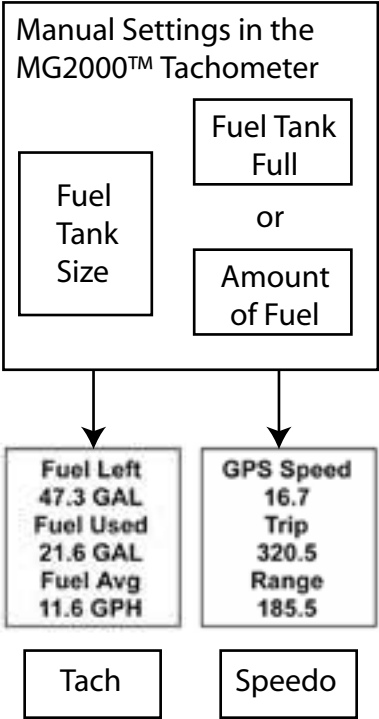
The FUEL LEVEL SENDER provides the information displayed in the Fuel Level bar graph. This display is the equivalent of a standard fuel gauge and should be used as the reference for the fuel remaining.

Each filled block represents 1/8 of a tank and when the fuel tank is empty only empty blocks will be displayed. For best accuracy, the fuel level sender should be calibrated as described in Edit Mode section of this manual.

Manual settings

The "Fuel Left" and "Range" display values are dependant on accurately setting the values for "Fuel Tank Size" and either "Fuel Tank Full" or "Amount of Fuel" in the MG2000™ Tachometer.

"Fuel Left" is calculated based on the amount of fuel entered in these settings (the amount of fuel the operator indicates is in the fuel tank) and the fuel flow of the engine. "Range" is calculated based on "Fuel Left", fuel flow, and current speed



Edit Mode

The "Edit" mode is used to adjust or set the values of numerous functions and options in the MG2000. The procedure below specifies the steps to be taken in the "Edit" mode to adjust / set each option.

To enter "EDIT" mode, press the "Mode" and "UP" buttons while in "NORMAL" mode

To return to "NORMAL" mode, press "Mode" button once while in "EDIT" mode

Functions that are set or adjusted in the "Edit" mode

1. Select Default Screen.
2. Reset Fuel Used.
3. Set Fuel Tank Full.
4. Set Amount Of Fuel.
5. Organize User Screens.
6. Select Gauge Range.
7. Select Fuel Sender.
8. Calibrate Trim Sender.
9. Select Display Units.
10. Select Fuel Tank Size.
11. Fuel Tank Calibrate.
12. Low Fuel Alarm.
13. Software Id and Revision.
14. Depth Sounder Warnings.
15. Select Self Test.

Instructions – <u>Function</u>	LINE	DISPLAY
<u>Select Default Screen</u>	1	Select
	2	Default
	3	Screen
Press & Hold "UP" & "DOWN" for 2 sec to select the "default screen"		
Press "UP" or "DOWN" to select another function or "Mode" to return to "Normal" mode		
(Display Screen 1 is the "default" at first turn on)	1	Display Screen 1
	2	
	3	
Press & Hold "UP" & "DOWN" for 2 sec to select screen 1 as the "default screen" and exit		
Press "UP" or "DOWN" to select another screen	1	Display Next Screen
	2	
	3	
Press & Hold "UP" & "DOWN" for 2 sec to select this screen as the "default screen" and exit		
Press "UP" or "DOWN" to select another screen Repeat until desired "default screen" is selected		
Press "UP" or "DOWN" to select another function or "Mode" to return to "Normal" mode		

<u>Reset Fuel Used</u>	1	Reset
	2	Fuel
	3	Used
Press & Hold “UP” & “DOWN” for 2 sec to reset “fuel used” to zero (0) Automatically resets fuel used to zero and returns to “Edit mode”		
Press “UP” or “DOWN” to select another function or “Mode” to return to “Normal” mode		
<u>Set Fuel Tank Full</u>	1	Set
	2	Fuel Tank
	3	Full
NOTE: In order to use the “Fuel Left” function, the owner must set this function when the fuel tank is filled or use the set current amount of fuel below. In addition, if “set fuel tank full” function is used, the “fuel tank size” must be set correctly to the size of the fuel tank in this application. The computer will monitor fuel usage and calculate the fuel left in the tank. This function does not replace the fuel level function provided by the fuel sender and should be used with caution.		
Press & Hold “UP” & “DOWN” for 2 sec to set “fuel tank full” Automatically sets the fuel available to the tank size selected by the user and returns to “Edit mode”		
Press “UP” or “DOWN” to select another function or “Mode” to return to “Normal” mode		
<u>Set Amount of Fuel</u>	1	Set
	2	Amount
	3	Of Fuel
NOTE: If a known amount of fuel is in the fuel tank but it is not full, this function can be used to indicate the amount of fuel available. The “fuel left” function will then use the amount of fuel entered to calculate the “fuel left”		
Press & Hold “UP” & “DOWN” for 2 sec to select “current amount of fuel”		
Press “UP” or “DOWN” to select another function or “Mode” to return to “NORMAL” mode		

<p>Press “UP” / “DOWN” to set the amount of fuel known to be in the fuel tank. Adjust until the displayed volume matches the known amount of fuel in the tank.</p> <p>When the volume is correctly set, press & hold “UP” & “DOWN” for 2 sec to save and exit</p>	1	Fuel Amount XXX G
	2	
	3	
<p align="center"><u>Organize User Screens</u></p>	1	Organize
	2	User
	3	Screens
<p>Press & Hold “UP” & “DOWN” for 2 sec to select “organize user screens”</p> <p>Press “UP” or “DOWN” to select another function or “Mode” to return to “NORMAL” mode</p>		
<p align="center">Organize screen 1</p>	1	Set up
	2	Screen
	3	1
<p>Press & Hold “UP” & “DOWN” for 2 sec to select “organize screen 1”</p> <p>Press “UP” or “DOWN” to select another screen or “Mode” to return to “Edit” mode</p>		
<p>Refer to the list of available functions in the owner’s manual. Press & Hold “UP” or “DOWN” to select the number of the function to be displayed in screen 1, line 1.</p>	1	Screen 1
	2	Line 1
	3	Item XX
<p>Press & Hold “UP” & “DOWN” for 2 sec to save selection for Screen 1, line 1 and advance to Screen 1, line 2</p> <p>Press “Mode” to exit with no change made</p>		
<p>Refer to the list of available functions in the owner’s manual. Press & Hold “UP” or “DOWN” to select the number of the function to be displayed in screen 1, line 2.</p>	1	Screen 1
	2	Line 2
	3	Item XX
<p>Press & Hold “UP” & “DOWN” for 2 sec to save selection for Screen 1, line 2 and advance to Screen 1, line 3</p> <p>Press “Mode” to exit with no change made</p>		
<p>Refer to the list of available functions in the owner’s manual. Press & Hold “UP” or “DOWN” to select the number of the function to be displayed in screen 1, line 3.</p>	1	Screen 1
	2	Line 3
	3	Item XX

Press & Hold "UP" & "DOWN" for 2 sec to save selection for Screen 1, line 3 and advance to view new screen 1. Press "Mode" to exit with no change made		
Press & Hold "UP" & "DOWN" for 2 sec to save new Screen 1 an exit to Press "Mode" to exit with no change made	1	Display Customer's New screen 1
	2	
	3	
Repeat for remaining screens (2, 3)		
Press "UP" or "DOWN" to select another function or "Mode" to return to "NORMAL" mode		
<u>Select Gauge Range</u>	1	Select
	2	Gauge
	3	Range
Press & Hold "UP" & "DOWN" for 2 sec to select "gauge range" Press "UP" or "DOWN" to select another function		
<u>Select Tachometer Dial</u>	1	Select
	2	Tachometer
	3	Dial
Press & Hold "UP" & "DOWN" for 2 sec to select "tachometer dial" Press "UP" or "DOWN" to select another "gauge range"		
Press "UP" / "DOWN" to select. When selected, press & hold "UP" & "DOWN" for 2 sec to save and return to "gauge range" selection	1	> 4000 RPM
	2	6000 RPM
	3	7000 RPM
<u>Select Oil Pressure Dial</u>	1	Select
	2	Oil Pressure
	3	Dial
Press & Hold "UP" & "DOWN" for 2 sec to select "oil pressure dial" Press "UP" or "DOWN" to select another "gauge range"		

Press "UP" / "DOWN" to select. When selected, press & hold "UP" & "DOWN" for 2 sec to save and return to "gauge range" selection	1	> 60 psi
	2	80 psi
	3	100 psi
<u>Select Coolant Temp Dial</u>	1	Select
	2	Coolant Temp
	3	Dial
Press & Hold "UP" & "DOWN" for 2 sec to select "coolant temp dial" Press "UP" or "DOWN" to select another "gauge range"		
Press "UP" / "DOWN" to select. When selected, press & hold "UP" & "DOWN" for 2 sec to save and return to "gauge range" selection	1	> 60 –220 F
	2	100 – 250 F
	3	
<u>Select Fuel Sender</u>	1	Select
	2	Fuel
	3	Sender
Press & Hold "UP" & "DOWN" for 2 sec to select "fuel sender" Press "UP" or "DOWN" to select another function		
Press "UP" / "DOWN" to select. When selected, press & hold "UP" & "DOWN" for 2 sec to save and return to select "fuel sender"	1	> USA 240 - 33
	2	EU 10 - 180
	3	
<u>Calibrate Trim Sender</u>	1	Calibrate
	2	Trim
	3	Sender
Press & Hold "UP" & "DOWN" for 2 sec to select "calibrate trim sender" Press "UP" or "DOWN" to select another function		
Using the Trim control, set the trim to the full "UP" position Press "UP" button to save "UP" setting	1	Set Trim
	2	UP
	3	Press UP
	4	TRIM
	5	

<p>Using the Trim control, set the trim to the full “DOWN” position Press “DOWN” button to save “DOWN” setting</p>	1	<p>Set Trim DOWN Press DOWN TRIM</p>
	2	
	3	
	4	
	5	
<p>Press “UP” to recal “UP” if desired Repeat as necessary When complete, press & hold “UP” & “DOWN” for 2 sec to save and return to “Calibrate Trim Sender”</p>		
<p style="text-align: center;"><u>Select Display Units</u></p>	1	Select
	2	Display
	3	Units
<p>Press & Hold “UP” & “DOWN” for 2 sec to select “units” Press “UP” or “DOWN” to select another function</p>		
<p style="text-align: center;"><u>Select Pressure Units</u></p>	1	Select
	2	Pressure
	3	
<p>Press & Hold “UP” & “DOWN” for 2 sec to select “pressure units” Press “UP” or “DOWN” to select another choice of “units”</p>		
<p>Press “UP” / “DOWN” to select. When selected, press & hold “UP” & “DOWN” for 2 sec to save and return to select “units”</p>	1	> PSI
	2	BAR
	3	
<p style="text-align: center;"><u>Select Volume Units</u></p>	1	Select
	2	Volume
	3	Units
<p>Press & Hold “UP” & “DOWN” for 2 sec to select “volume units” Press “UP” or “DOWN” to select another choice of “units”</p>		

Press "UP" / "DOWN" to select. When selected, press & hold "UP" & "DOWN" for 2 sec to save and return to select "units"	1	>	GAL LITERS
	2		
	3		
<u>Select Temperature Units</u>	1		Select Temperature Units
	2		
	3		
Press & Hold "UP" & "DOWN" for 2 sec to select "temperature units" Press "UP" or "DOWN" to select another choice of "units"			
Press "UP" / "DOWN" to select. When selected, press & hold "UP" & "DOWN" for 2 sec to save and return to select "units"	1	>	°F °C
	2		
	3		
<u>Select Depth Units</u>	1		Select Depth Units
	2		
	3		
Press & Hold "UP" & "DOWN" for 2 sec to select "depth units" Press "UP" or "DOWN" to select another choice of "units"			
Press "UP" / "DOWN" to select. When selected, press & hold "UP" & "DOWN" for 2 sec to save and return to select "units"	1	>	Feet Meters Fathoms
	2		
	3		
Press "UP" or "DOWN" to select another function or "Mode" to return to "NORMAL" mode			
<u>Select Fuel Tank Size</u>	1		Select Fuel Tank Size
	2		
	3		
Press & Hold "UP" & "DOWN" for 2 sec to select "fuel tank size" Press "UP" or "DOWN" to select another function			

<p>Press "UP" / "DOWN" to select either the Standard or Other fuel tank selections.</p> <p>If Standard is selected, press & hold "UP" & "DOWN" for 2 sec to go to the following selection screens.</p> <p>If Other is selected, press & hold "UP" & "DOWN" for 2 sec to go to the manual entry selection screens (see below).</p>	Select	Select
	Other	Standard
	Fuel Tank	Fuel Tank
	Size	Size
<p>Press "UP" / "DOWN" to select the fuel tank size from the list.</p> <p>When selected, press & hold "UP" & "DOWN" for 2 sec to save and exit</p>	1	Select
	2	Fuel Tank
	3	Size
	4	> 0
	5	25 GAL
	6	36 GAL
<p>These selections will appear during scrolling. Only three selections are displayed at one time.</p>		40 GAL
		50 GAL
		55 GAL
		80 GAL
		100 GAL
		120 GAL
	150 GAL	
Manual Entry Screens		
<p>If there is no tank size available in the list that matches your tank size, continue to the next screen.</p>		
<p>Press & hold "UP" & "DOWN" for 2 sec to select the Other "set fuel tank size" function. Press & Hold "UP" & "DOWN" for 2 sec to go to the adjustment screen.</p>	1	Set
	2	Fuel Tank
	3	Size
<p>Press "UP" / "DOWN" to set the fuel tank size displayed on the screen to match your fuel tank size.</p> <p>When set, press & hold "UP" & "DOWN" for 2 sec to save and exit</p>	1	Fuel Tank
	2	Size
	3	255 (max) G
<u>Fuel Tank Calibration</u>		
	1	Fuel
	2	Tank
	3	Calibrate

Press & Hold “UP” & “DOWN” for 2 sec to select “fuel tank calibration” Press “UP” or “DOWN” to select another function		
Ensure that fuel tank is as empty as possible	1	Calibrate
	2	Fuel
	3	EMPTY
Press & Hold “UP” & “DOWN” for 2 sec to set empty calibration. Press & Hold “UP” & “DOWN” for 2 sec to save data and return to “Fuel Tank Calibration”.		
Press & Hold “UP” & “DOWN” for 2 sec to set Half calibration. Press & Hold “UP” & “DOWN” for 2 sec to save data and return to “Fuel Tank Calibration”.	1	Calibrate
	2	Fuel
	3	HALF FULL
Press & Hold “UP” & “DOWN” for 2 sec to set Full calibration. Press & Hold “UP” & “DOWN” for 2 sec to save data and return to “Fuel Tank Calibration”.	1	Calibrate
	2	Fuel
	3	Full
Press “UP” or “DOWN” to select another function or “Mode” to return to “NORMAL” mode		
<u>Low Fuel Alarm</u>	1	Low
	2	Fuel
	3	Alarm
Press & Hold “UP” & “DOWN” for 2 sec to select “low fuel alarm” Press “UP” or “DOWN” to select another function		
Adjust low fuel alarm setting Press “UP” or “DOWN” to set desired “low fuel alarm” setting. Line 3 value will adjust. Press & Hold “UP” & “DOWN” for 2 sec to save “low fuel alarm” and exit	1	Low
	2	Fuel
	3	XX.X G
Press “UP” or “DOWN” to select another function or “Mode” to return to “NORMAL” mode		
<u>Software Id and Revision</u>	Software Id & Revision Minigateway PGFXXXX-X	

<u>Depth Sounder Warnings</u>	1	Shallow warning
	2	Deep warning
	3	Keel Offset
<p>Press & Hold “UP” & “DOWN” for 2 sec to select “warning or offset”. Press “UP” or “DOWN” to adjust the function</p> <p>Press & Hold “UP” & “DOWN” for 2 sec to select “warning or offset”. Press “UP” or “DOWN” to adjust the function</p> <p>Press & Hold “UP” & “DOWN” for 2 sec to return to setting warnings or offset.</p> <p>Press “UP” or “DOWN” to select another “warning” or “offset”.</p>		
<p>Press the “MODE” button to return to the “EDIT” mode. Press “MODE” button to return to normal mode.</p>		
<u>Select Self Test</u>	1	Select
	2	Self
	3	Test
<p>Press & Hold “UP” & “DOWN” for 2 sec to select “self test”</p> <p>Press “UP” or “DOWN” to select another function</p>		
<p>This screen will display for 10 sec.</p> <p>The horn will sound once.</p> <p>The warning lights will flash three times</p> <p>The backlights will flash three times</p>	1	The
	1a	Self
	2	Test
	2a	Mode
	3	Is in
	3a	Operation
<p>When “self test” is complete the unit will return to the “Edit mode”</p> <p>Press “UP” or “DOWN” to select another function or “Mode” to return to “NORMAL” mode</p>		

Available Functions for Display in J1708 / J1587 MG2000

Tachometer Screens

The functions listed below can be displayed in the user configurable screens. All of the functions may not be available in your installation. If a function is selected for display and that function does not appear on the screen, the function does not exist in this installation. A function is selected for display by selecting it's number from the list below.

1. Volts
2. Trim
3. Oil pressure
4. Engine Temp
5. Engine Hour
6. Fuel Left
7. Fuel Used
8. Fuel avg
9. Depth Alarm Mode

The "alarm" screen appears only if an alarm condition exists. The alarm condition may be a warning sent from the engine ECU or a "local" alarm such as "Low Fuel". When an alarm condition occurs, the "Alarm Screen" will appear and the screens described below will be displayed.

The descriptions below also explain how to temporarily override the alarm screen and audible / visual warnings and return to "NORMAL" mode. In all cases, the alarm will re-occur after a period of time to ensure that the user remembers the alarm condition. Once an alarm condition has been corrected, the alarm screen, horn, and warning lights will no longer be displayed. An "ALARMS CLEAR !" screen will be displayed until the MODE then either UP or DOWN buttons are pressed.

ALARM MODE	LINE	DISPLAY
The "Alarm" screen will only appear if a local alarm or an engine alarm occurs. Local alarm is "low fuel". Only two engine alarms appear automatically, "Check Engine" and "Engine Emergency Stop". Follow the instructions provided to view more information about engine alarms.		
LOW FUEL		
Displays "low fuel" warning Red LED blinks Horn "beeps"	1	Low
	2	Fuel
	3	!

Press “Mode” to turn off LED, silence alarm horn, and return to “Run” mode. Alarm will reactivate in 15 minutes but can continue to be deactivated as required.

ENGINE WARNINGS

Any engine alarm except “Engine Emergency Stop”
Red LED blinks
Horn “beeps”

1

CHECK

2

ENGINE

3

!

“Engine Emergency Stop” alarm
Red LED on continuously
Horn on continuously

1

ENGINE

2

EMERGENCY

3

STOP !

Press & Hold “UP” & “DOWN” for 2 sec to view alarm messages
Press “Mode” to silence alarm horn and return to “Run” mode. LED will continue to function as stated until engine alarm(s) is no longer sent by ECU

Alarm Messages From the Engine ECU

CHECK ENGINE

1

CHECK

2

ENGINE

3

!

OVER TEMPERATURE

1

HIGH

2

ENGINE

3

TEMP

LOW OIL PRESSURE

1

LOW

2

OIL

3

PRESSURE

LOW OIL LEVEL

1

LOW

2

OIL

3

LEVEL

LOW FUEL PRESSURE

1

LOW

2

FUEL

3

PRESSURE

LOW SYSTEM VOLTAGE

1

LOW

2

SYSTEM

3

VOLTAGE

LOW COOLANT LEVEL	1	LOW COOLANT LEVEL
	2	
	3	
WATER FLOW	1	WATER FLOW
	2	
	3	
WATER IN FUEL	1	WATER IN FUEL
	2	
	3	
CHARGE INDICATOR	1	CHARGE INDICATOR
	2	
	3	
PREHEAT INDICATOR	1	PREHEAT INDICATOR
	2	
	3	
HIGH BOOST PRESSURE	1	HIGH BOOST PRESSURE
	2	
	3	
REV LIMIT EXCEEDED	1	REV LIMIT EXCEEDED
	2	
	3	
EGR SYSTEM	1	EGR SYSTEM
	2	
	3	
THROTTLE POSITION SENSOR	1	THROTTLE POSITION SENSOR
	2	
	3	
ENGINE EMERGENCY STOP	1	ENGINE EMERGENCY STOP !
	2	
	3	

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