Commander™
Tachometer/ Engine Hourmeter

Owner’s Manual

- Analog Tachometer
  Digitally displays
- Hours Engine Has Been Run
- Fuel Level
- Other Features if Available:
  - Fuel Management
    Fuel Flow in GPH or LPH
    Total or Trip Fuel Used
    Low Fuel Alarm
    Calculates Fuel Remaining In Tank
  - SystemCheck® with Fuel Management or
  - Ambient Air/ Water Temperature

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Harness HN0358
Small Connector
SystemCheck® adaptor

Small connector (CN0082)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Purple</td>
<td>+14 Ignition</td>
</tr>
<tr>
<td>B</td>
<td>Tan/Orange</td>
<td>Check Engine</td>
</tr>
<tr>
<td>C</td>
<td>Black</td>
<td>Ground</td>
</tr>
<tr>
<td>D</td>
<td>Gray</td>
<td>Tachometer Signal</td>
</tr>
</tbody>
</table>

To Small Connector Socket

SystemCheck® Harness

Pin A Purple +14 vDC Ignition
Pin B Tan/Orange Check Engine
Pin C Black Ground
Pin D Gray Tachometer Signal

HN0358 SystemCheck Wire Diagram

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Smaller Connector
Larger Connector

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HN0356 Smaller Socket Connection Wire Diagram
HN0354 Larger connection Fuel Management Wire Diagram
HN0358 SystemCheck Wire Diagram
Installation:

**CAUTION:** Disconnect the battery during installation. Tighten nuts on the backclamp only slightly more than you can tighten with your fingers. Six inch-pounds of torque are sufficient. Over-tightening could result in damage to the instrument and may void your warranty.

1. **Cut a 3-3/8” diameter hole** in the dash and mount the gauge with the backclamp supplied.

Follow the enclosed instructions for installing the sender. Once the sender is installed and you have run the cables to the Commander, connect the wires from the sender to the corresponding Small or Large connectors as illustrated using the butt connectors supplied. The butt connectors have a heat activated waterproofing. Once the butt connections have been crimped slowly apply heat with a heat gun until you see sealant coming out of the connector ends. It is recommended to wrap the connections together with electrical tape for further protection.

2. **Small Connector Socket**

**Tachometer with Fuel Flow**

Follow the wiring diagram at the end of this manual for wiring connections. HN0356.

SystemCheck® connections can be found on HN0358.

**Tachometer with Ambient Air and Water Temperature.**

Follow the wiring diagram at the end of this manual for wiring connections. HN0355.

3. **Large Connector Socket**

**Tachometer with Fuel Flow**

Follow the wiring diagram at the end of this manual for wiring connections. HN0354.

SystemCheck® connections can be found on HN0358.

**Tachometer with Ambient Air and Water Temperature.**

Follow the wiring diagram at the end of this manual for wiring connections. HN0355 or HN0372 for 5 inch Commanders.
Harness HN0356
Small Connector

To Commander

Small Plug (CN0082)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Purple</td>
<td>+12 Ignition Power</td>
</tr>
<tr>
<td>B</td>
<td>Purple</td>
<td>+12 Ignition Power</td>
</tr>
<tr>
<td>C</td>
<td>Black</td>
<td>Ground</td>
</tr>
<tr>
<td>D</td>
<td>Gray</td>
<td>Tachometer Input</td>
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</table>

Shrink Tubing or Wrap

<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Purple</td>
<td>Ignition</td>
</tr>
<tr>
<td>Gray</td>
<td>Tach Signal</td>
</tr>
<tr>
<td>Black</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Description

The Commander has three push buttons:

- **Mode Button**
- **Up Button**
- **Down Button**

These buttons control the modes of operation. The “Mode” button is used to change the function of the LCD display and to access sub menus and adjustable settings. The “Up” and “Down” buttons are used to modify the settings.

In normal operation mode, pressing the “Mode” button quickly causes the display to cycle between the different instrument displays. Pressing and holding the “Mode” button causes the display to change to the “settings” sub menus (see Figure 1).

When the settings menus have been selected, pressing the “Mode” button quickly causes the display to cycle through the setting options. Within each setting selection, pressing the “Up” and “Down” buttons causes the affected setting to change.

**Note:** The microprocessor will automatically record the new settings as you adjust them.

When in a setting menu, pressing and holding the “Mode” button returns to the main function.

The Tachometer and Fuel Level functions have several values that can be adjusted to match your installed equipment. These rarely used settings are changed in the **Set-Up Mode** (see Set-Up Menu guide below).

Operation

**Lighting**

In normal operating mode the instrument lighting can be adjusted by pressing the “Up” and “Down” buttons.

**Tachometer**

The tachometer is a digital instrument with the appearance of an analog instrument. The tachometer is preset at the factory for an eight cylinder engine and a 6000 RPM dial. The setting for the tachometer can be changed in the **Set-Up** menu (see below).

A microprocessor controlled stepper motor moves the pointer to display engine revolutions per minute using a linear dial.

**Engine Running Only Hourmeter**

The Engine Hours display shows the number of hours the engine has been operated (Hr). The reading is based on a signal being received at the tachometer input to indicate that the engine is running.

Units are displayed as:

**Fuel Level**

The Fuel Level display shows the amount
of fuel in the fuel tank in percent of full (PC). The indication is based on the fuel level sender in the tank and operates similarly to a normal fuel gauge. There are no adjustments to this reading.

**Note:** For proper operation no additional fuel gauges may be connected to the fuel level sender.

**Other Features**
The Commander can have special features programmed in it at the Factory.


2) Ambient Air and Water Temperature.

This manual covers both. Refer to your boats owners manual for which feature have been installed.

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### Setup Mode

Tachometer settings and the fuel level sender type can be changed using the Setup Mode (see Figure 2, Table 1, and Table 2). Use this option only if you have reason to believe that your settings are wrong. Setting an incorrect value in these menus can result in extremely inaccurate performance of the tachometer and fuel level sender.

To access the Setup Mode, press and hold both the “Up” and “Down” buttons while turning on the instrument.

Briefly pressing the “Mode” button will cycle through the menu items.

The “Up” and “Down” buttons are used to modify the settings.

The microprocessor will automatically record the new settings as you change them.

---

**Tachometer Selection Table**

<table>
<thead>
<tr>
<th>TAC 1</th>
<th>Two pulses per rev. (4 cylinder, 4 cycle gas engine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAC 2</td>
<td>Three pulses per rev. (6 cylinder, 4 cycle gas engine)</td>
</tr>
<tr>
<td>TAC 3</td>
<td>Four pulses per rev. (8 cylinder, 4 cycle gas engine)</td>
</tr>
<tr>
<td>TAC 4</td>
<td>Five pulses per rev. (10 pole alternator on outboard engine)</td>
</tr>
<tr>
<td>TAC 5</td>
<td>Six pulses per rev. (12 pole alternator on outboard engine)</td>
</tr>
<tr>
<td>TAC 6</td>
<td>Eight pulses per rev. (Not Used)</td>
</tr>
<tr>
<td>TAC 7</td>
<td>Ten pulses per rev. (20 pole alternator on outboard engine)</td>
</tr>
<tr>
<td>TAC 8 TH</td>
<td>Two to Two Hundred Fifty pulses per rev.</td>
</tr>
<tr>
<td>TAC 9 VA</td>
<td>Match reference calibration digital or mechanical tachometer</td>
</tr>
</tbody>
</table>

**Fuel Sender Selection Table**

| US | Standard United States fuel sender (240 – 33 Ohms) |
| EU | Standard European fuel sender (10 – 180 Ohms) |

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Figure 3
Tachometer Full Scale Selection
Refer to Figure 3 for an explanation of each of the tachometer full scale selections.

This is normally a factory setting that needs no adjustment. The setting adjusts the “full scale” operating range of the tachometer to match the dial on the instrument. Using the “Up” and “Down” buttons, adjust the setting to match the maximum reading on the tachometer dial, 4000, 6000, or 7000 RPM.

Fuel Level Sender Selection
Refer to Figure 3 and Table 2 for an explanation of each of the fuel level sender selections. Using the “Up” and “Down” buttons, adjust the setting to match the fuel level sender installed in the fuel tank.

Set-Up Mode

Enter Setup Mode:
Press both the ■□ buttons while turning on instrument.
To exit the setup mode, press and hold the □ M button.

Set-Up start screen, shows that setup mode has been entered.

Flashes SETTING then shows current Tach selection.

Flashes TEETH then shows current number of teeth (pulses) per rev. if TAC8 TH was selected.

Flashes VARIABLE and then shows current RPM if TAC9 VA was selected.

Pressing and holding the “Mode” button sets the instrument to normal operation.

Tachometer Selection
Refer to Figure 3 and Table 1 for an explanation of each of the tachometer selections.

T SCALE-
The “TAC 1” - “TAC 7” settings are normal engine tachometer settings based on different engine options found on most boats. Using “Up” and “Down” buttons, adjust the setting to match the engine in the boat as shown in Figure 3.

The “TAC 8TH” setting is normally used on diesel engines with a magnetic pick-up measuring the number of teeth on the flywheel of the engine. When this option is selected, the “TEETH” submenu is available.

Using the “Up” and “Down” buttons, adjust the number shown in the display to match the reference tachometer.

The “TAC 9VA” setting is normally used when a belt driven alternator supplies the tachometer signal OR when no other method of selecting the tachometer mode gives correct readings.

A digital or mechanical reference tachometer is needed to use this option. When this option is selected, the “VARIABL” submenu is available.

Connect the reference tachometer as required. Operate the engine at a convenient RPM as high as can be safely maintained.

Using the “Up” and “Down” buttons, adjust the number shown in the display to match the reference tachometer.

The tachometer pointer should also match the reference tachometer.

SENDER
Allows you to set the type of sender you are using. See Figure 3.

Using the “Up” and “Down” buttons, adjust the number shown in the “TEETH” display until the number matches the published number of flywheel teeth for the engine.

Set up is now complete.
Installation Guide for the fuel flow transducer

**IMPORTANT**
Always install the Fuel Flow Transducer AFTER the primary filter. The primary filter must be a good quality water separator type with a minimum filtration of 30 microns or better. (10 or 2 micron. The lower the micron rating the finer the filtration) Failure to provide this level of filtration protection will result in inaccurate readings or total failure or damage to the transducer. If there is not a suitable length of hose after the primary filter, an in-line filter (30 micron or better) should be fitted before the Fuel Flow transducer. Damage due to insufficient filtration is not covered by warranty. If in doubt please consult your local Marine dealer for advice prior to installation.

**Wiring Connection**
- Keep electrical and transducer cables away from alternator or other noise generating electrical cables.

**Installation of the fuel flow transducer**
The fuel flow transducer is designed for installation in Coast Guard approved 3/8" flexible fuel line. The transducer MUST be installed AFTER the main fuel filter. It should be located well away from any area where it will be effected by excessive heat or vibration from the engine. It is preferable to mount the transducer in a vertical position.

Drain all the fuel from the flexible fuel line. Cut the fuel line and using the fuel hose attaching clips provided install the transducer so that the FUEL IN side of the transducer connects to the fuel tank.

**Harness HN0355/HN372**
Large Connector
Air/Water Temp.

HN0355 - 4 inch Commanders

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>Red</td>
<td>Air Temperature</td>
</tr>
<tr>
<td>B</td>
<td>Black</td>
<td>Ground</td>
</tr>
<tr>
<td>C</td>
<td>White</td>
<td>Water Temperature</td>
</tr>
<tr>
<td>D</td>
<td>Pink</td>
<td>Fuel Tank Sensor</td>
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HN0372 - 5 inch Commanders
Same as above- Add the following

<table>
<thead>
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<tbody>
<tr>
<td>E</td>
<td>Plug</td>
</tr>
<tr>
<td>F</td>
<td>Plug</td>
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ECR 1903 12/21/01
Ambient Air and Water Temperature

Description
The Faria Commander Tachometer/ Water-Air Temperature/ Fuel Level/ Engine Hourmeter combines the features of several instruments into one unit. The LCD displays the information for the other instruments:

1) Water Temperature - Displays the current water temperature.
2) Ambient Air Temperature - Displays current air temperature.
3) Fuel Level - Displays fuel level in fuel tank (based on level sender) in percent.
4) Engine Hours - Displays the number of hours the engine has been run.

Water Temperature

The Water Temperature display shows current water temperature based on a Faria supplied temperature probe. The probe must be mounted so as to always be submerged to the depth desired. There are no adjustments for this function.

Ambient Air Temperature

The Ambient Air Temperature display shows current air temperature based on a Faria supplied temperature probe.

Fuel Management Functions

Description
The Faria Commander Tachometer/ Fuel Monitor/ Engine Hourmeter combines the features of several instruments into one unit. The LCD displays the information for the other instruments:

1) Fuel Flow - Displays current fuel usage in Gallons or Liters per hour.
2) Fuel Used - Displays fuel used since last reset (trip fuel meter).
3) Total Fuel Used - Displays fuel used since last reset (total fuel meter).
4) Fuel Remaining - Displays the fuel remaining since last set (based on fuel flow).
5) Fuel Level - Displays fuel level in fuel tank (based on level sender) in percent.
6) Engine Hours - Displays the number of hours the engine has been run.

Fuel Flow

The Fuel Flow display shows current fuel consumption in gallons per hour (G) or liters per hour (L).

The fuel flow sensor can be calibrated if necessary using the Fuel Used “settings” menu (see Fuel Used description below). The units displayed may be changed using the submenu. Pressing and holding the “Mode” button causes the display to change to the “UNITS” submenu (see Figure 1).

Fuel Used

The Fuel Used display shows the amount of fuel used since the gauge was reset.

Fuel Remaining

The display is based on the fuel flow system and therefore filling the fuel tank will not disturb the reading. The Fuel Used gauge may be reset to zero and the Fuel Used and Fuel Flow system calibrated using the sub menus.
causes the display to change to the “settings” submenu (see Figure 1).

Fuel Used “Settings” Menu
There are two items in the Fuel Used “Settings” Menu; Reset and Fuel Calibration. Briefly pressing the “Mode” button cycles through the menu items. The microprocessor will automatically record the new settings as you adjust them.

Pressing the “Up” and “Down” buttons resets the Fuel Used gauge to zero.

Calibration
If you know “exactly” how much fuel you have used since the Fuel Used gauge was reset you can adjust the amount and therefore the Fuel Flow sensor calibration in this “setting” menu. Pressing the “Up” or “Down” buttons changes the “amount of fuel used” display.

When the displayed quantity matches the amount of fuel you know you have used, calibration is complete.

Total Fuel Used
The Total Fuel Used display shows the amount of fuel used since the Total Fuel Used gauge was reset.

This gauge is useful for keeping track of fuel usage over a longer period of time or distance than the Fuel Used gauge. The display is based on the fuel flow system and therefore filling the fuel tank will not disturb the reading.

The Total Fuel Used gauge may be reset to zero using the submenu. Pressing and holding the “Mode” button causes the display to change to the “settings” submenu (see Figure 1).

Total Fuel Used “Settings” Menu
There is one item in the Fuel Used “Settings” Menu; Reset.

This page left blank intentionally.
If the engine stops running, but the key switch remains on, the unit will automatically go to “Diagnostic” mode.

**Diagnostic mode:** Simple diagnostics can be done with the key on, engine off. The intent is to aid the service technician in troubleshooting wiring or sensor problems. It can also be used to verify a system when there is no engine on the boat.

In this mode, the following assumptions are made:

1) The key switch is on.
2) There is no tachometer signal (the engine is not running).
3) When the key switch is turned on, the self-test will be performed as usual.

After the self test is completed, the technician can ground any sensor input lead. The system will immediately display the fault condition associated with that input. The audible alarm is not sounded in this mode. In the event of a wiring error, it would be possible for multiple inputs to be grounded. In that case, the unit will display the multiple messages.

---

**Fuel Remaining**

The Fuel Remaining display shows the amount of fuel remaining in G or L.

This display is based on your manually entered information (see Adjust Fuel Remaining below) and the accumulated Fuel Flow data since the gauge was adjusted. This information is not obtained from the fuel sender in the fuel tank and therefore is not affected by the boat’s position or angle as the fuel sender may be.

There is an alarm which may be set to warn of a low fuel condition. The amount of Fuel Remaining and the Fuel Remaining Alarm may be adjusted using the submenu. Pressing and holding the “Mode” button causes the display to change to the “settings” submenu (see Figure 1).
This alarm may be set to warn you when there is only a certain amount of fuel remaining according to the Fuel Flow usage calculation. Pressing the “Up” or “Down” buttons will change the Fuel Remaining Alarm setting.

The Fuel Level display shows the amount of fuel in the fuel tank in percent of full (PC). The indication is based on the fuel level sender in the tank and operates similarly to a normal fuel gauge. There are no adjustments to this reading.

### Fuel Level

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Down</td>
<td>Button</td>
</tr>
<tr>
<td>Up</td>
<td>Button</td>
</tr>
</tbody>
</table>

### Fuel Management LCD Display Modes

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick Press</td>
<td>Fuel Flow</td>
</tr>
<tr>
<td>Hold</td>
<td>Fuel Units</td>
</tr>
<tr>
<td>Quick Press</td>
<td>Engine Hours</td>
</tr>
<tr>
<td>Hold</td>
<td>Fuel Level(Sender)</td>
</tr>
<tr>
<td>Hold</td>
<td>Total Fuel Used</td>
</tr>
<tr>
<td>Quick Press</td>
<td>Fuel Remaining</td>
</tr>
<tr>
<td>Hold</td>
<td>Adjust</td>
</tr>
<tr>
<td></td>
<td>Alarm</td>
</tr>
</tbody>
</table>

**Figure 1**

**Bombardier® SystemCheck® Description**

The Bombardier SystemCheck is a system that monitors Evinrude® and Johnson® outboard engine sensors, providing clear audible and visual indications whenever a fault occurs.

The system monitors engine temperature, oil level, oil flow, oil pressure, and fuel restriction. In addition, the ECM (Engine Control Module) can activate a warning indication. Not all sensors are present on all engines.

For information about the wiring of the Commander to the SystemCheck harness can be found on HN0358 in this manual.

**Engine Temperature:**

The displayed warning is “ENG HOT”.

**Oil level:**

The sensor is a mechanical float switch in the 2 cycle oil reservoir.

The displayed warning is “LO OIL”.

**Oil Flow:**

*Four stroke engine:* An oil pressure switch is used.

*Two stroke engine:* An oil flow sensor is used to detect oil flow out of the oil injection system.

The warning will be displayed as “NO OIL”.

**Check Engine:**

For fuel injected engines, the EMU generates the warning based on several fault conditions. For non-injected V6 outboard engines, a vacuum sensor is fitted in the fuel line. This is used to detect a blocked fuel line or fuel filter. (Non-injected engines without the vacuum sensor will not display this function.)

The warning will be displayed as “CHK ENG”.

**Operating Modes**

There are three operating modes for SystemCheck systems, self test, normal, and diagnostic.

**Self test:**

On power up (key on), a limited self-test is performed to inform the operator that the system is active. The test activates the audible alarm and all warning messages. During the self test, the audible alarm sounds for 1/4 second. At the same time, the unit begins displaying all of the warning messages. Each warning message is displayed for 1 second. When all four messages have been displayed, the self test is complete.

**Normal mode:** This mode occurs when two conditions are met. The self test must be complete, and the engine must be running in excess of 200 R.P.M. In this mode, any fault detected will result in an audible and visual alarm. Both will commence simultaneously.

The audible alarm will sound for 10 seconds. The visual warning will be displayed for as long as the fault conditions exist.
This alarm may be set to warn you when there is only a certain amount of fuel remaining according to the Fuel Flow usage calculation. Pressing the “Up” or “Down” buttons will change the Fuel Remaining Alarm setting.

The Fuel Level display shows the amount of fuel in the fuel tank in percent of full (PC). The indication is based on the fuel level sender in the tank and operates similarly to a normal fuel gauge. There are no adjustments to this reading.

For information about the wiring of the Commander to the SystemCheck harness can be found on HN0358 in this manual.

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If the engine stops running, but the key switch remains on, the unit will automatically go to “Diagnostic” mode.

**Diagnostic mode:** Simple diagnostics can be done with the key on, engine off. The intent is to aid the service technician in troubleshooting wiring or sensor problems. It can also be used to verify a system when there is no engine on the boat.

In this mode, the following assumptions are made:

1) The key switch is on.
2) There is no tachometer signal (the engine is not running).
3) When the key switch is turned on, the self-test will be performed as usual.

After the self test is completed, the technician can ground any sensor input lead. The system will immediately display the fault condition associated with that input. The audible alarm is not sounded in this mode. In the event of a wiring error, it would be possible for multiple inputs to be grounded. In that case, the unit will display the multiple messages.

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**Reset**

Pressing the “Up” or “Down” button resets the Total Fuel Used gauge to zero.

**Fuel Remaining**

The Fuel Remaining display shows the amount of fuel remaining in G or L.

This display is based on your manually entered information (see Adjust Fuel Remaining below) and the accumulated Fuel Flow data since the gauge was adjusted. This information is not obtained from the fuel sender in the fuel tank and therefore is not affected by the boat's position or angle as the fuel sender may be.

There is an alarm which may be set to warn of a low fuel condition. The amount of Fuel Remaining and the Fuel Remaining Alarm may be adjusted using the submenu. Pressing and holding the “Mode” button causes the display to change to the “settings” submenu (see Figure 1).
Ambient Air and Water Temperature

Description
The Faria Commander Tachometer/ Water-Air Temperature/ Fuel Level/ Engine Hourmeter combines the features of several instruments into one unit. The LCD displays the information for the other instruments:

1) Water Temperature - Displays the current water temperature.
2) Ambient Air Temperature - Displays shows current air temperature 
3) Fuel Level - Displays fuel level in fuel tank (based on level sender) in percent.
4) Engine Hours - Displays the number of hours the engine has been run.

Water Temperature

The Water Temperature display shows current water temperature based on a Faria supplied temperature probe. The probe must be mounted so as to always be submerged to the depth desired. There are no adjustments for this function.

Air Temperature

The Air Temperature display shows current air temperature based on a Faria supplied temperature probe.

Fuel Management Functions

Description
The Faria Commander Tachometer/ Fuel Monitor/ Engine Hourmeter combines the features of several instruments into one unit. The LCD displays the information for the other instruments:

1) Fuel Flow - Displays current fuel usage in Gallons or Liters per hour.
2) Fuel Used - Displays fuel used since last reset (trip fuel meter).
3) Total Fuel Used - Displays fuel used since last reset (total fuel meter).
4) Fuel Remaining - Displays the fuel remaining since last set (based on fuel flow).
5) Fuel Level - Displays fuel level in fuel tank (based on level sender) in percent.
6) Engine Hours - Displays the number of hours the engine has been run.

Fuel Flow

The Fuel Flow display shows current fuel consumption in gallons per hour (G) or liters per hour (L).

The fuel flow sensor can be calibrated if necessary using the Fuel Used “settings” menu (see Fuel Used description below). The units displayed may be changed using the submenu. Pressing and holding the “Mode” button causes the display to change to the “UNITS” submenu (see Figure 1).

Fuel Used

The Fuel Used display shows the amount of fuel used since the gauge was reset.

The display is based on the fuel flow system and therefore filling the fuel tank will not disturb the reading. The Fuel Used gauge may be reset to zero and the Fuel Used and Fuel Flow system calibrated using the sub menus.

Fuel Flow “UNITS” Menu

Pressing the “Up” and “Down” buttons will change the setting between GH and LH.
Installation Guide for the fuel flow transducer

**IMPORTANT**
Always install the Fuel Flow Transducer AFTER the primary filter. The primary filter must be a good quality water separator type with a minimum filtration of 30 microns or better. (10 or 2 micron. The lower the micron rating the finer the filtration) Failure to provide this level of filtration protection will result in inaccurate readings or total failure or damage to the transducer. If there is not a suitable length of hose after the primary filter, an in-line filter (30 micron or better) should be fitted before the Fuel Flow transducer. Damage due to insufficient filtration is not covered by warranty. If in doubt please consult your local Marine dealer for advice prior to installation.

**Wiring Connection**
- Keep electrical and transducer cables away from alternator or other noise generating electrical cables.

**Installation of the fuel flow transducer**
The fuel flow transducer is designed for installation in Coast Guard approved 3/8” flexible fuel line. The transducer MUST be installed AFTER the main fuel filter. It should be located well away from any area where it will be effected by excessive heat or vibration from the engine. It is preferable to mount the transducer in a vertical position. Drain all the fuel from the flexible fuel line. Cut the fuel line and using the fuel hose attaching clips provided install the transducer so that the FUEL IN side of the transducer connects to the fuel tank.

---

**Harness HN0355/HN372**

**Large Connector**

**Air/Water Temp.**

**HN0355 - 4 inch Commanders**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Red</td>
<td>Air Temperature</td>
</tr>
<tr>
<td>B</td>
<td>Black</td>
<td>Ground</td>
</tr>
<tr>
<td>C</td>
<td>White</td>
<td>Water Temperature</td>
</tr>
<tr>
<td>D</td>
<td>Pink</td>
<td>Fuel Tank Sensor</td>
</tr>
<tr>
<td>E</td>
<td>Plug</td>
<td>Not Used</td>
</tr>
<tr>
<td>F</td>
<td>Plug</td>
<td>Not Used</td>
</tr>
</tbody>
</table>

**HN0372 - 5 inch Commanders**

Same as above- Add the following

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Plug</td>
</tr>
<tr>
<td>F</td>
<td>Plug</td>
</tr>
</tbody>
</table>

---

**Water Temp. Sensor signal**

**Air Temp. Sensor signal**

---

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Page 5

Page 13
**Tachometer Full Scale Selection**
Refer to Figure 3 for an explanation of each of the tachometer full scale selections.

This is normally a factory setting that needs no adjustment. The setting adjusts the “full scale” operating range of the tachometer to match the dial on the instrument. Using the “Up” and “Down” buttons, adjust the setting to match the maximum reading on the tachometer dial, 4000, 6000, or 7000 RPM.

**Fuel Level Sender Selection**
Refer to Figure 3 and Table 2 for an explanation of each of the fuel level sender selections. Using the “Up” and “Down” buttons, adjust the setting to match the fuel level sender installed in the fuel tank.

**Set-Up Mode**

**Enter Setup Mode:**
Press both the buttons while turning on instrument.
To exit the setup mode, press and hold the button.

**Screen shows:**

- `SETUP`

**Flashes** then shows current Tach selection.

**Flashes** and then shows current RPM if was selected.

**Flashes** then shows current number of teeth (pulses) per rev. if was selected.

**Flashes** then shows current Tach selection.

**Tachometer Selection**
Refer to Figure 3 and Table 1 for an explanation of each of the tachometer selections.

**T Scale**
- The “TAC 1” - “TAC 7” settings are normal engine tachometer settings based on different engine options found on most boats. Using “Up” and “Down” buttons, adjust the setting to match the engine in the boat as shown in Figure 3.

- The “TAC 8TH” setting is normally used on diesel engines with a magnetic pick-up measuring the number of teeth on the flywheel of the engine. When this option is selected, the “TEETH” submenu is available.

- The “TAC 9 VA” setting is normally used when a belt driven alternator supplies the tachometer signal OR when no other method of selecting the tachometer mode gives correct readings.

A digital or mechanical reference tachometer is needed to use this option. When this option is selected, the “VARIABL” submenu is available.

**Connect the reference tachometer as required. Operate the engine at a convenient RPM as high as can be safely maintained.**

Using the “Up” and “Down” buttons, adjust the number shown in the display to match the reference tachometer.

The tachometer pointer should also match the reference tachometer.

**Sender**
Allows you to set the type of sender you are using. See Figure 3.

Using the “Up” and “Down” buttons, adjust the number shown in the “TEETH” display until the number matches the published number of flywheel teeth for the engine.

Set up is now complete.
of fuel in the fuel tank in percent of full (PC). The indication is based on the fuel level sender in the tank and operates similarly to a normal fuel gauge. There are no adjustments to this reading.

**Note:** For proper operation no additional fuel gauges may be connected to the fuel level sender.

**Other Features**
The Commander can have special features programmed in it at the Factory.


2) Ambient Air and Water Temperature.

This manual covers both. Refer to your boats owners manual for which feature have been installed.

## Setup Mode

Tachometer settings and the fuel level sender type can be changed using the Setup Mode (see Figure 2, Table 1, and Table 2). Use this option only if you have reason to believe that your settings are wrong. Setting an incorrect value in these menus can result in extremely inaccurate performance of the tachometer and fuel level sender.

To access the Setup Mode, press and hold both the “Up” and “Down” buttons while turning on the instrument.

![Mode Button](image)

Briefly pressing the “Mode” button will cycle through the menu items.

![Setup Screen](image)

The “Up” and “Down” buttons are used to modify the settings.

The microprocessor will automatically record the new settings as you change them.

<table>
<thead>
<tr>
<th>Tachometer Selection Table</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TAC 1</strong></td>
</tr>
<tr>
<td><strong>TAC 2</strong></td>
</tr>
<tr>
<td><strong>TAC 3</strong></td>
</tr>
<tr>
<td><strong>TAC 4</strong></td>
</tr>
<tr>
<td><strong>TAC 5</strong></td>
</tr>
<tr>
<td><strong>TAC 6</strong></td>
</tr>
<tr>
<td><strong>TAC 7</strong></td>
</tr>
<tr>
<td><strong>TAC 8 TH</strong></td>
</tr>
<tr>
<td><strong>TAC 9 VA</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fuel Sender Selection Table</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US</strong></td>
</tr>
<tr>
<td><strong>EU</strong></td>
</tr>
</tbody>
</table>

*Figure 3*
Harness HN0356
Small Connector

To Commander

<table>
<thead>
<tr>
<th>Small Plug (CN0082)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin A</td>
</tr>
<tr>
<td>Pin B</td>
</tr>
<tr>
<td>Pin C</td>
</tr>
<tr>
<td>Pin D</td>
</tr>
</tbody>
</table>

Shrink Tubing or Wrap

| Purple (Ignition) | Gray (Tach Signal) | Black (Ground) |

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Description

The Commander has three push buttons;

- **Mode** Button
- **Up** Button
- **Down** Button

These buttons control the modes of operation. The “Mode” button is used to change the function of the LCD display and to access sub menus and adjustable settings. The “Up” and “Down” buttons are used to modify the settings.

In normal operation mode, pressing the “Mode” button quickly causes the display to cycle between the different instrument displays. Pressing and holding the “Mode” button causes the display to change to the “settings” sub menus (see Figure 1).

When the settings menus have been selected, pressing the “Mode” button quickly causes the display to cycle through the setting options. Within each setting selection, pressing the “Up” and “Down” buttons causes the affected setting to change.

**Note:** The microprocessor will automatically record the new settings as you adjust them.

When in a setting menu, pressing and holding the “Mode” button returns to the main function.

The Tachometer and Fuel Level functions have several values that can be adjusted to match your installed equipment. These rarely used settings are changed in the **Set-Up Mode** (see Set-Up Menu guide below).

Operation

Lighting

In normal operating mode the instrument lighting can be adjusted by pressing the “Up” and “Down” buttons.

Tachometer

The tachometer is a digital instrument with the appearance of an analog instrument. The tachometer is preset at the factory for an eight cylinder engine and a 6000 RPM dial. The setting for the tachometer can be changed in the **Set-Up** menu (see below).

A microprocessor controlled stepper motor moves the pointer to display engine revolutions per minute using a linear dial.

Engine Running Only Hourmeter

The Engine Hours display shows the number of hours the engine has been operated (Hr). The reading is based on a signal being received at the tachometer input to indicate that the engine is running.

Units are displayed as:

Fuel Level

The Fuel Level display shows the amount
This manual for 4 or 5 inch Commanders with
1) Tach/Hour/Fuel Flow.
2) Tach/Hour/SystemCheck®/Fuel Flow.
3) Tach/Hour/Ambient Air/Water Temperature.

Installation:
CAUTION: Disconnect the battery during installation. Tighten nuts on the backclamp only slightly more than you can tighten with your fingers. Six inch-pounds of torque are sufficient. Over-tightening could result in damage to the instrument and may void your warranty.

1. Cut a 3-3/8” diameter hole in the dash and mount the gauge with the backclamp supplied.

Follow the enclosed instructions for installing the sender. Once the sender is installed and you have run the cables to the Commander, connect the wires from the sender to the corresponding Small or Large connectors as illustrated using the butt connectors supplied. The butt connectors have a heat activated waterproofing. Once the butt connections have been crimped slowly apply heat with a heat gun until you see sealant coming out of the connector ends. It is recommended to wrap the connections together with electrical tape for further protection.

2. Small Connector Socket
Tachometer with Fuel Flow
Follow the wiring diagram at the end of this manual for wiring connections. HN0356.
SystemCheck® connections can be found on HN0358.

Tachometer with Ambient Air and Water Temperature.
Follow the wiring diagram at the end of this manual for wiring connections. HN0355.

3. Large Connector Socket
Tachometer with Fuel Flow
Follow the wiring diagram at the end of this manual for wiring connections. HN0354.
SystemCheck® connections can be found on HN0358.

Tachometer with Ambient Air and Water Temperature.
Follow the wiring diagram at the end of this manual for wiring connections. HN0355 or HN0372 for 5 inch Commanders.
Harness HN0358
Small Connector
SystemCheck® adaptor

Small connector (CN0082)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Purple</td>
<td>+14 Ignition</td>
</tr>
<tr>
<td>B</td>
<td>Tan/Orange</td>
<td>Check Engine</td>
</tr>
<tr>
<td>C</td>
<td>Black</td>
<td>Ground</td>
</tr>
<tr>
<td>D</td>
<td>Gray</td>
<td>Tachometer Signal</td>
</tr>
</tbody>
</table>

To Small Connector Socket

SystemCheck® Harness

Pin A Purple +14 vDC Ignition
Pin B Tan/Orange Check Engine
Pin C Black Ground
Pin D Gray Tachometer Signal

ECR 2275 4/15/02

SystemCheck® Harness Deutsch Connector

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Purple</td>
<td>+14 vDC Ignition</td>
</tr>
<tr>
<td>2</td>
<td>Black</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Gray</td>
<td>Tachometer Signal</td>
</tr>
<tr>
<td>4</td>
<td>Tan/Yellow</td>
<td>No Oil Sensor</td>
</tr>
<tr>
<td>5</td>
<td>Tan/Black</td>
<td>Low Oil Sensor</td>
</tr>
<tr>
<td>6</td>
<td>Tan</td>
<td>Over Temperature</td>
</tr>
<tr>
<td>7</td>
<td>Tan/Orange</td>
<td>Lo Oil Sensor</td>
</tr>
<tr>
<td>8</td>
<td>Not Used</td>
<td></td>
</tr>
</tbody>
</table>

ECR 2275 4/15/02

Installation
- Smaller Connector
- Larger Connector

Operations
- Lighting
- Tachometer
- Engine Running Only Hourmeter
- Fuel Level
- Other Features
- Set-Up Mode
  - Tachometer Selection

Fuel Management
- Installation guide (Fuel Flow Transducer)
- Fuel Flow
- Units per Hour selection
- Fuel Used
  - Reset
  - Calibrate
- Total Fuel Used
  - Reset
- Fuel Remaining
  - Adjust Fuel Remaining
  - Fuel Remaining Alarm
- Fuel Level

Bombardier® SystemCheck®
- Discription
- Engine Temperature
- Oil Level
- Oil Flow
  - Four Stroke engine
  - Two Stroke engine
- Check Engine
- Operating Modes
  - Self Test
  - Normal Mode
  - Diagnostic Mode

Ambient Air and Water Temperature
- Discription
- Water Temperature
- Air Temperature

Figure 1 Fuel Management LCD Display Modes
Figure 2 Air/Water LCD Display Modes
Figure 3 Tachometer Set-Up
  - Table 1 Tachometer Selection Table
  - Table 2 Fuel Sender Selection Table

HN0355 Larger connection Air/Water Temp.Wire Diagram
HN0356 Smaller Socket Connection Wire Diagram
HN0354 Larger connection Fuel Management Wire Diagram
HN0358 SystemCheck Wire Diagram

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Large connector (CN0083)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Red</td>
<td>Fuel Transducer Power</td>
</tr>
<tr>
<td>B</td>
<td>Tan</td>
<td>Over Temperature</td>
</tr>
<tr>
<td>C</td>
<td>White</td>
<td>Fuel Transducer Signal</td>
</tr>
<tr>
<td>D</td>
<td>Pink</td>
<td>Fuel Tank Level</td>
</tr>
<tr>
<td>E</td>
<td>Tan/Black</td>
<td>Low Oil Sensor</td>
</tr>
<tr>
<td>F</td>
<td>Tan/Yellow</td>
<td>No Oil Sensor</td>
</tr>
</tbody>
</table>

Pink (Fuel Tank Level)
White (Fuel Flow Transducer Power)
White (Fuel Flow Transducer Signal)
Black (Fuel Flow Transducer Ground)

ECR 2275 4/15/02
Commander™
Tachometer/Engine Hourmeter

Owner’s Manual

- Analog Tachometer
  Digitally displays
- Hours Engine Has Been Run
- Fuel Level
- Other Features if Available:
  - Fuel Management
    - Fuel Flow in GPH or LPH
    - Total or Trip Fuel Used
    - Low Fuel Alarm
    - Calculates Fuel Remaining In Tank
  - SystemCheck® with Fuel Management
  or
  - Ambient Air/ Water Temperature