GARMIN

G1000™

engine indication system

pilot's guide for Mooney

M20M & M20R

Record of Revisions			
Revision	**Date of Revision**	**Revision Page Range**	**Description**
A	10/18/04	7-1 – 7-8	Initial release.

The G1000 Engine Indication System (EIS) is designed to provide gauges, bar graphs and numeric readouts of engine parameters to the flight crew. The EIS also displays the rudder trim, elevator trim and flap position indicators. The EIS is displayed on the left side of the MFD during normal operations. In reversionary mode, the CDUs are re-configured to present the PFD symbology together with the EIS (the EIS is displayed on the left side).

The EIS contains three distinct pages which are accessed by the **ENGINE** softkey:

- Engine (default)
- Lean
- System

7.1 ENGINE

This is the default page, which displays all critical engine, fuel and electrical indicators. Atop this page are round dial gauges with a white pointer and digital readouts for manifold pressure and revolutions per minute (RPM). Below those gauges are color-coded horizontal bar indicators with triangle pointers and numeric readouts indicating fuel quantity (no numeric readout), fuel flow (normally aspirated), fuel pressure (turbocharged), oil pressure, oil temperature, exhaust gas temperature (EGT) of the hottest cylinder – for normally aspirated aircraft, turbine inlet temperature (TIT) – for turbocharged aircraft, and cylinder head temperature (CHT) of the hottest cylinder. The pointer on the horizontal bar indicators appears in white, which represents acceptable areas of operation. The pointer color changes to yellow or red upon exceeding areas of normal operation. The green band is indicative of normal areas of operation. Located beneath the horizontal bar indicators are the electrical indicators. A numeric readout is provided for the bus voltage and battery amperage.

Beneath the EIS strip is the rudder trim position indicator. Located to the lower right of the EIS strip are the flap and elevator trim position indicators.

Manifold Pressure Gauge

The Manifold Pressure gauge displays the engine power in inches of mercury (in Hg).

- **White –** Normal operating range
- **Red –** Maximum manifold pressure (turbocharged)

Tachometer

The Tachometer displays propeller speed in revolutions per minute (RPM).

- **White –** Below normal flight operating range
- **Green –** Normal flight operating range
- **Red –** Propeller overspeed

Fuel Qty Indicator

The Fuel Quantity indicator displays the quantity of fuel in the tanks in gallons. The indicator ranges from 0 (Empty) to F (Full) with tick marks at 5 gallon intervals. Two triangle pointers labeled L (Left) and R (Right) indicate the number of gallons in each fuel tank.

- **Green –** Normal
- **Yellow –** Caution
- **Red –** Warning

NOTE: *The Fuel Quantity indicator only displays to 44.5 gallons when full.*

NOTE: *The pilot should refer to the Aircraft Flight Manual (AFM) for limitations.*

Fuel Flow GPH Indicator (Normally Aspirated)

The Fuel Flow indicator displays current fuel flow in gallons per hour (GPH). The indicator ranges from 0 to 30. This indicator does not have a color band.

Fuel Pressure Indicator (Turbocharged)

The Fuel Pressure indicator displays the fuel pressure in pounds per square inch (PSI).

- **Green –** Normal
- **Yellow –** Caution
- **Red –** Warning (minimum and maximum)

Oil Pressure Indicator

The Oil Pressure indicator displays the pressure of the oil supplied to the engine in pounds per square inch (PSI).

- **Green –** Normal
- **Yellow –** Caution (low and high indications are on turbocharged aircraft only)
- **Red –** Warning (minimum and maximum)

Oil Temperature Indicator

The Oil Temperature indicator displays the engine oil temperature in degrees Fahrenheit.

- **Green –** Normal
- **Red –** Warning

EGT Indicator (Normally Aspirated)

The EGT (Exhaust Gas Temperature) indicator displays the exhaust gas temperature of the hottest cylinder in degrees Fahrenheit.

- **White –** Normal
- **Red –** Warning

TIT Indicator (Turbocharged)

The TIT (Turbine Inlet Temperature) indicator displays the temperature at the turbine inlet in degrees Fahrenheit.

- **Green –** Normal
- **Red –** Warning

CHT Indicator

The CHT (Cylinder Head Temperature) indicator displays the temperature of the hottest cylinder in degrees Fahrenheit. The number of the hottest cylinder appears in the triangle pointer.

- **Green –** Normal
- **Red –** Warning

Voltmeter

The Voltmeter displays the bus voltage for the selected battery (i.e., VOLTS1 or VOLTS2).

Ammeter

The Ammeter displays the battery amperage for the selected battery (i.e., BAT1 or BAT2).

***NOTE:** The pilot should refer to the Aircraft Flight Manual (AFM) for limitations.*

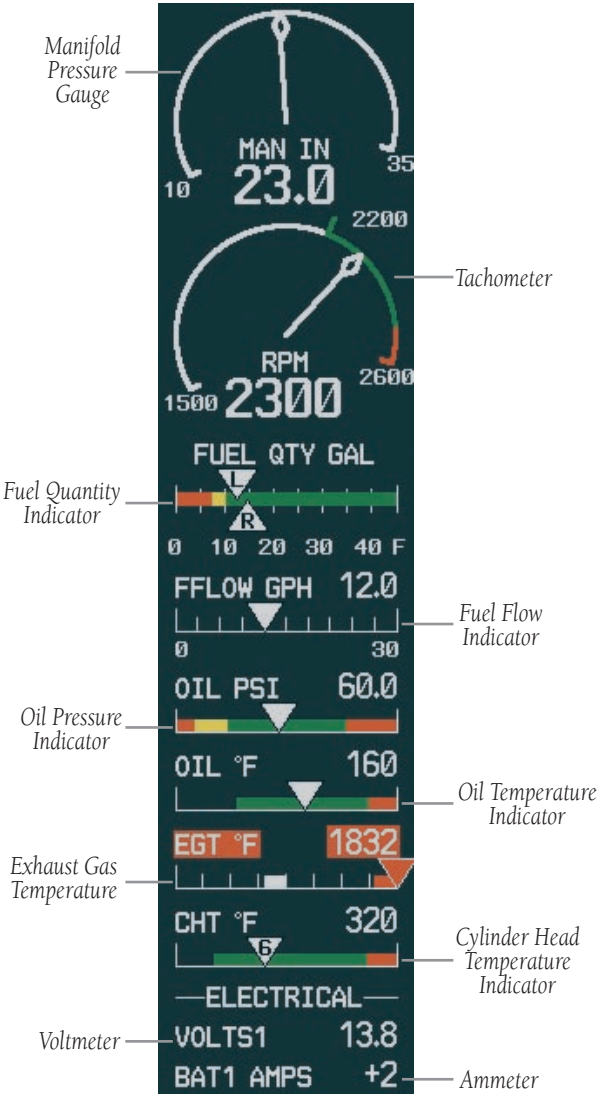

Figure 7.1.1 ENGINE Page (Normally Aspirated)

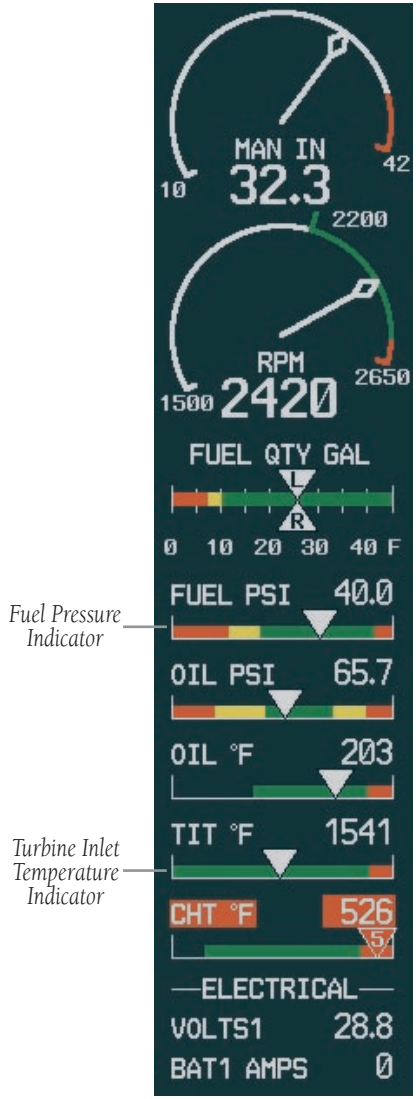

Figure 7.1.2 ENGINE Page (Turbocharged)

7.2 LEAN

The Lean Page provides information and a user interface to perform engine leaning. Located beneath the tachometer is a color-coded horizontal bar indicator for fuel quantity and a numeric readout for fuel flow. Below these indicators are bar graphs and numeric readouts for exhaust gas temperature (EGT) – for normally aspirated aircraft and cylinder head temperature (CHT) in degrees Fahrenheit. By default, the numeric readouts of EGT and CHT are associated with the hottest cylinder and are graphically indicated in cyan (light blue). Color coding for the EGT and CHT bar graphs is listed below:

- **Cyan –** Selected cylinder (EGT and CHT)
- **White –** Normal (EGT and CHT)
- **Yellow –** Caution (CHT only)
- **Red –** Warning (CHT only)

The temperature deviation from peak in degrees Fahrenheit for normally aspirated aircraft is displayed beneath the EGT readout. Located to the lower right of the EIS strip are the flap and elevator trim position indicators. The rudder trim is not shown on this page.

Cylinder Select

The **CYL SLCT** softkey can be utilized to obtain information about a particular cylinder.

The **CYL SLCT** softkey becomes disabled when a particular cylinder turns yellow (Caution) or red (Warning), until the temperature decreases and returns to normal, which is indicated by white on the bar graph. It is also disabled when the **ASSIST** softkey is pressed.

The **CYL SLCT** and **ASSIST** softkeys are available by pressing the **LEAN** softkey.

To monitor the desired cylinder(s):

1. From the Lean Page, press the **CYL SLCT** softkey to cycle through each cylinder and view the EGT and CHT.

Lean Assist

The **ASSIST** softkey can be utilized to assist in the leaning process.

Normally Aspirated

When a cylinder peaks, its peak is represented by a hollow bar on the EGT bar graph. The EGT readout for the peaked cylinder, indicated in cyan (light blue), appears directly beneath the bar graph. The system automatically switches to the first peak obtained and displays the temperature deviation from peak in degrees Fahrenheit below the EGT readout.

***NOTE**: The Lean Assist function is not available for the turbocharged Mooney models.*

***NOTE**: The pilot should follow the engine manufacturer's recommended leaning procedures in the Aircraft Flight Manual (AFM).*

The **ASSIST** softkey is available by pressing the **LEAN** softkey.

To select the Assist function:

1. From the Lean Page, press the **ASSIST** softkey to acquire EGT peak.

***NOTE:** Pilots should refer to the Aircraft Flight Manual (AFM) for limitations.*

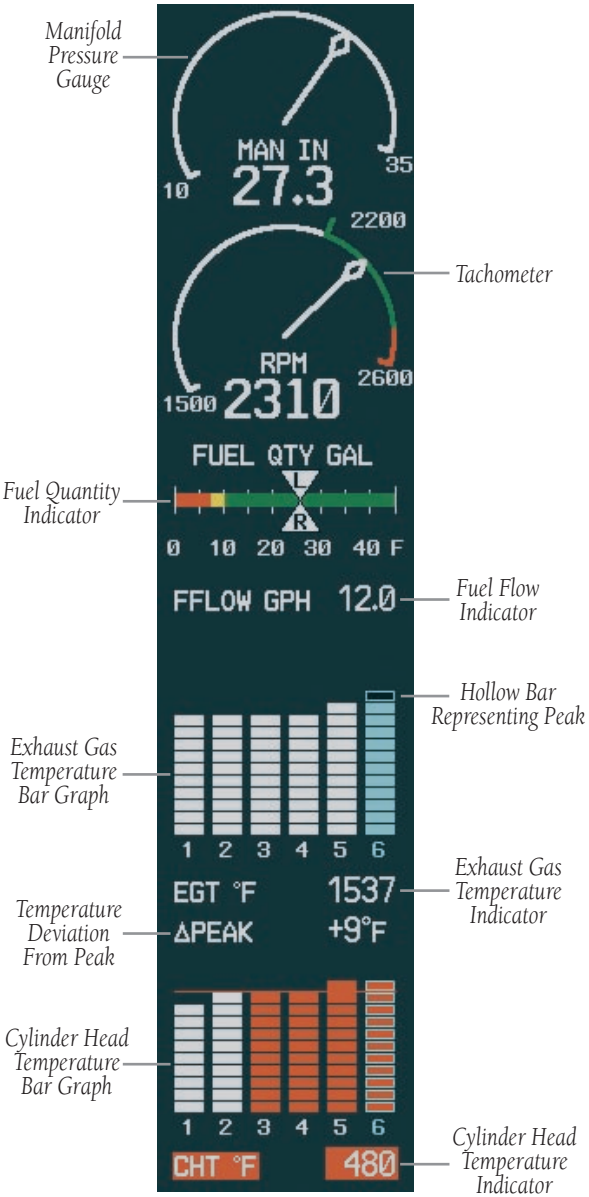

Figure 7.2.1 LEAN Page (Normally Aspirated)

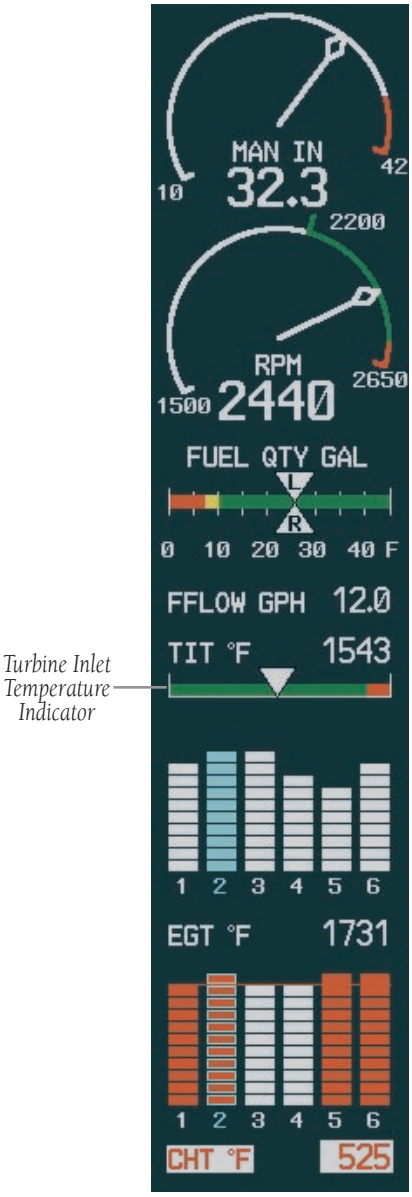

Figure 7.2.2 LEAN Page (Turbocharged)

7.3 SYSTEM

The System Page displays a numeric readout for the fuel pressure (turbocharged), engine and electrical indicators. Located beneath the Tachometer is a color-coded horizontal bar indicator for fuel quantity (an additional color-coded horizontal bar indicator is displayed for fuel pressure in the turbocharged aircraft). Beneath these indicators are the numeric readouts for oil pressure, oil temperature and engine hours (tach). Below the engine indicators are the fuel calculations. A numeric readout is provided for fuel flow, and gallons used. The fuel calculation portion of the System Page is based on the fuel flow totalizer and displays the following:

- **FF GPH –** Fuel flow in gallons per hour.
- **GAL USED –** Quantity of fuel used in gallons.

Below the fuel calculations is a color-coded horizontal bar indicator with a numeric readout for EGT (normally aspirated). Located at the bottom of the page are the electrical indicators. A numeric readout is provided for bus voltage and battery amperage. The triangle pointer, text and numeric readout for fuel quantity (triangle pointer only), fuel pressure (turbocharged), oil pressure, oil temperature, EGT (normally aspirated) and CHT (normally aspirated) appear in white, which represents acceptable areas of operation. The color changes to yellow (Caution), or red (Warning), upon exceeding areas of normal operation. Beneath the EIS strip is the rudder trim position indicator. Located to the lower right of the EIS strip are the flap and elevator trim position indicators.

If desired, the pilot can utilize the **RST USED** softkey to reset the GAL USED indicator.

The second-level softkey is available by pressing the **SYSTEM** softkey:

- **RST USED –** Reset totalizer-based fuel used display to zero.

To reset the fuel used totalizer:

1. From the System Page, press the **RST USED** softkey. This resets the GAL USED to zero.

***NOTE:** Fuel calculations do not use the aircraft fuel quantity indicators and are calculated from the last time the fuel was reset.*

***NOTE:** Pilots should refer to the Aircraft Flight Manual (AFM) for limitations.*

Figure 7.3.1 SYSTEM Page (Normally Aspirated)

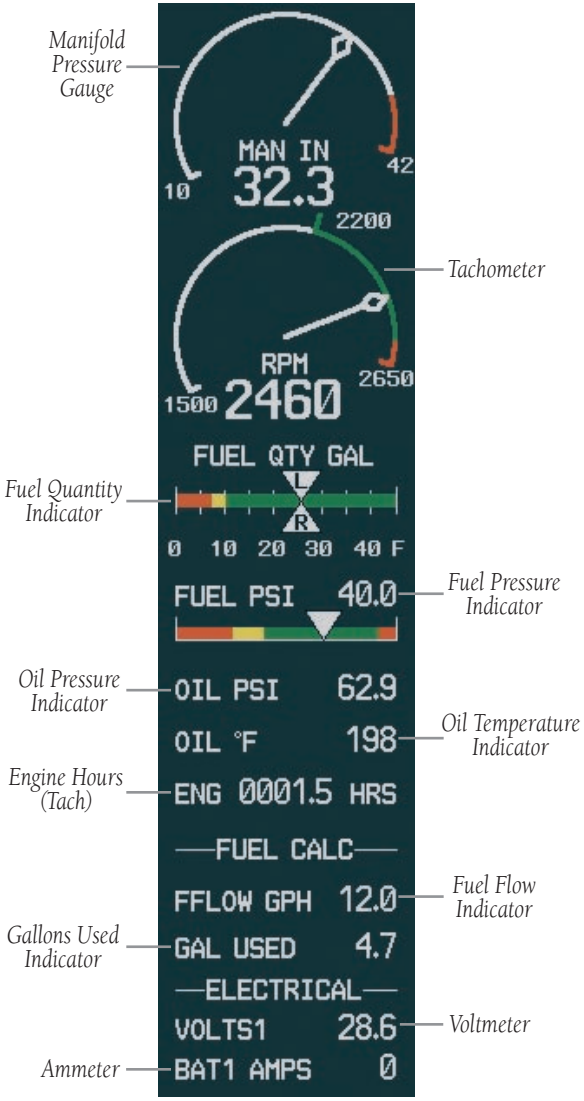

Figure 7.3.2 SYSTEM Page (Turbocharged)

7.4 FLAP & TRIM INDICATIONS

Rudder Trim Position Indicator

The rudder trim position is displayed by a cyan (light blue) triangle on a horizontal bar indicator. L (left) and R (right) tick marks are shown. The white bar indicates the takeoff setting range.

Figure 7.4.1 Rudder Trim

Elevator Trim Position Indicator

The elevator trim position is displayed by a cyan (light blue) triangle pointer on a vertical bar indicator. UP and DN tick marks are shown. The white bar indicates the takeoff setting range.

Figure 7.4.2 Elevator Trim

Flap Position Indicator

The flap position indicator is collocated with the elevator trim position indicator. The flap indications are displayed inside the box on top the elevator trim. The flap positions are as follows:

- UP
- T/O (takeoff)
- DN (down)

Figure 7.4.3 Flaps – Up

Figure 7.4.4 Flaps – Takeoff

Figure 7.4.5 Flaps – Down

When the flaps are in transit and not within these ranges, '///' is displayed inside the box.

Figure 7.4.6 Flaps – In Transit

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