NexSysLink®

CAN Instruments
Product Family

2” CAN Display Operation Manual

SAE J1939 Edition

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Table of Contents

List of Figures

• About

The 2" Stand-Alone CAN Display instrument is a member of the Beede NexSysLink® CAN instruments product family.

This instrument directly reads SAE J1939 compliant CAN messages and displays the message information on a sunlight visible, transflective dot-matrix LCD. Like all NexSysLink® instruments, this product eliminates the need for a translation "black box" between an ECM/ECU and the instrument itself making wiring and installation simple and fast.

Three discrete alert LEDs provide users with visual notification of engine/vehicle/vessel parameter faults, warnings and malfunctions.
Built-in, sealed, tactile switches allow users to easily navigate the intuitive menu driven user interface. The integration of the switches also reduces wiring to further reduce installation time and costs; essentially providing a plug-and-play product.

Although designed to "stand-alone", the instrument may be used in conjunction with other NexSysLink® instruments to monitor your equipment.

• Scope

This manual describes how to navigate the LCD interface and use the many features the instrument provides. Although the interface is intuitive and easy to navigate, this operation manual provides users with a resource to realize the full potential and capabilities of the instrument.

Covered in this manual are display options, menu navigation and menu function usage.

Although some wiring connections are noted for easy reference, this manual does not cover complete installation mounting and wiring requirements. Please refer to the installation instruction sheet for proper installation.

• Preconfigured Instruments

Some instruments are preconfigured at the factory to individual OEM specifications to best meet the needs of the application and end user.

Preconfigured features include but may not be limited to alarm configuration, single or dual line display and backlight intensity.

Preconfigured features are easily modified to satisfy personal preferences.

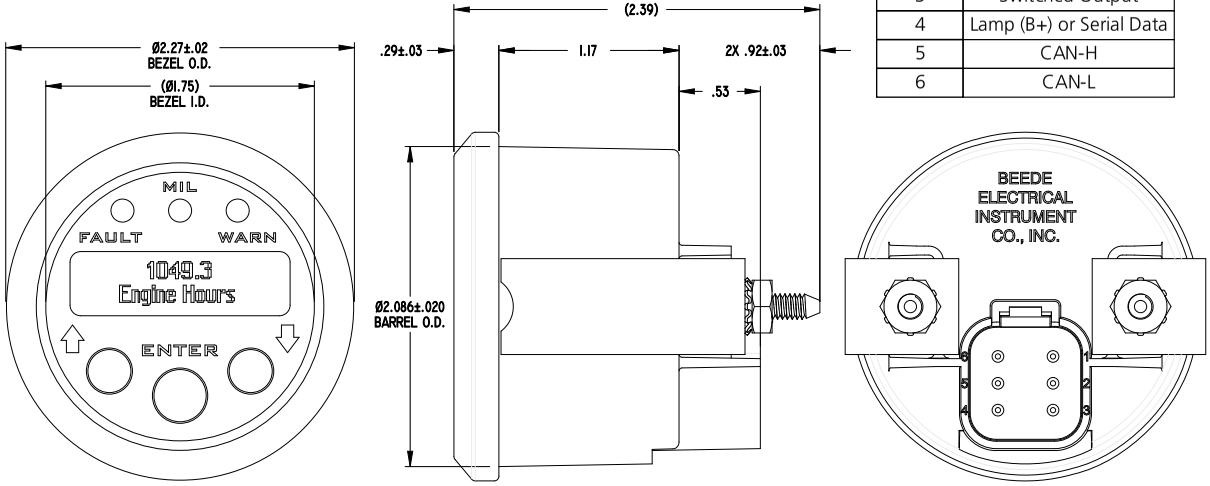
• Stand-Alone and Master Node Configurations

The instrument is primarily designed to "stand-alone" in applications where ease of use, limited space and simple installation are critical criteria in choosing the type of engine/vehicle/vessel monitoring electronics.

In order to satisfy a wide range of application demands, the hardware of the 2" CAN Display can be factory configured to drive a maximum of 16 Beede NexSysLink® Slave Node Instruments (SNI) or Analog Slave Node Instruments (ASNI).

The ability to connect with ASNI gauges expands the instruments capabilities to display analog inputs such as fuel level or air pressure.

When factory configured to drive Beede NexSysLink® SNI or ASNI gauges, Pin 4 of the 6 pin connector is used for serial data communication among the instruments.



6 Pin Connector Wiring Table	
Pin Number	Connection Name
1	Battery +
2	Ground
3	Switched Output
4	Lamp (B+) or Serial Data
5	CAN-H
6	CAN-L

Mounting hole size:
Ø2.125±.015"
(Ø53.98±0.38mm)

Mounting hardware torque:
6 lb-in
(0.68 N-m) max.

Refer to the appropriate Beede installation instruction sheet for complete installation requirements.

Dimensions shown are in inches.

• Menu Navigation

Menu navigation is accomplished through three built-in momentary switches. The switch functions are MENU/ENTER/RESET, UP and DOWN.

• Menu/Enter/Reset Switch

As its name suggests, this switch serves several purposes when navigating the user interface. The function depends upon the context of the menu option but is labeled ENTER on the instrument.

Menu Function: Pressing and holding this switch for approximately three seconds when any parameter screen is displayed brings up the main menu.

Enter Function: Pressing and releasing this switch provides enter functionality when the operator is required to choose a menu item, parameter, or value.

Reset Function: Pressing and holding this switch resets the selected trip miles or maintenance hour value to zero.

• Up Switch

Pressing and releasing the Up switch scrolls up through the CAN parameter list, menu choices or increases a value one item/unit at a time.
Pressing and holding the Up switch continuously scrolls up through the CAN parameter list, menu choices or increases a value until the end of the menu choices or maximum value is reached.

• Down Switch

The Down switch functions identical to the Up switch with the exception that its direction for all lists, menu choices and values is down or decreasing.

• Switch Icon Conventions

Throughout this manual, icons are used to indicate actions required by the user to navigate the menus. Below are descriptions and the corresponding action to be taken when they appear.

Press and release Menu/Enter/Reset switch icon.

The presence of this icon in the manual indicates when to press and release the Menu/Enter/Reset switch.

Press and hold Menu/Enter/Reset switch icon.

The presence of this icon in the manual indicates when to press and hold the Menu/Enter/Reset switch for approximately three seconds.

Press Up switch icon.

The presence of this icon in the manual indicates when to press and release the Up switch. Users may also choose to press and hold the Up switch if necessary.

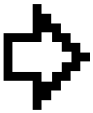
Press Down switch icon.

The presence of this icon in the manual indicates when to press and release the Down switch. Users may also choose to press and hold the Down switch if necessary.

• Menu Navigation (Continued)

The user interface contains various icons and indicators to guide users for item selection and/or input while navigating the menus. The selection arrow, menu scrolling icon and blinking bar cursors appear frequently throughout the menus.

• Selection Arrow Cursor



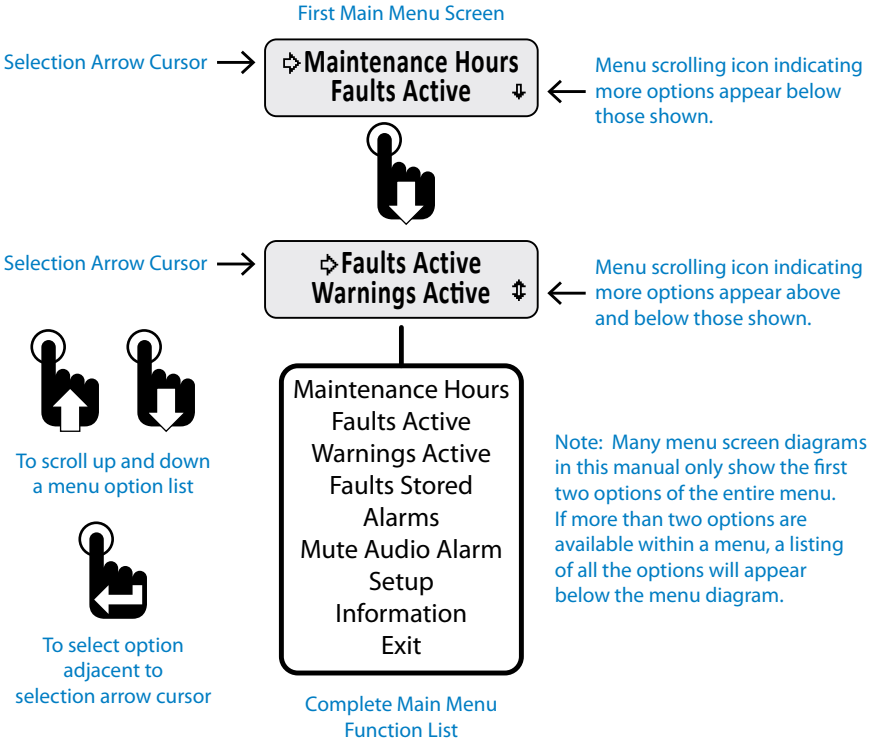
The selection arrow cursor, shown at left, identifies adjacent menu items as the current selection. Pressing the Enter switch selects the menu item/function or value adjacent to the arrow cursor.

Pressing and releasing an Up or Down switch moves the selection arrow up or down a menu list one item at a time until the beginning or end of the list is reached. Pressing and holding the Up or Down switch continuously moves the selection arrow up and down a menu list until the switch is released or the beginning or end of the list is reached.

• Menu Scrolling Icons

A menu scrolling icon appears in the lower right corner of the display to indicate if more menu options appear only above, only below or above and below the menu option or options currently displayed.

Figure 1-1: Menu Scrolling and Option Selection



• Blinking Bar Cursor

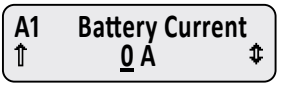
A blinking bar cursor appearing beneath a numeric value or CAN parameter indicates the item may be changed by pressing or pressing and holding either the Up or Down switches.

When a numeric value appears above a blinking bar cursor, pressing or pressing and holding the Up or Down switch increases or decreases the value until the maximum value limits are reached.

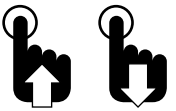
When a CAN parameter appears above a blinking bar cursor, pressing or pressing and holding either the Up or Down switch scrolls through the list of CAN parameters until the end of the list is reached.

Figure 1-2: Blinking Bar Cursor

Blinking Bar Cursor
located under parameter name



Blinking Bar Cursor
located under amperage value



Pressing the Up or Down switch
changes the CAN parameter or value until the
end of the list or limits of the value range is reached.

Pressing the Enter switch when
the desired parameter or value is
displayed accepts the parameter or value.

• Start-up Routine

Upon Instrument start-up, the three alert LEDs will flash then the Beede logo followed by the SAE logo appear for approximately three seconds.

• Default CAN Parameter Screen

After completion of the start-up routine, the Engine Hours CAN parameter appears. If power was removed from the instrument with a different parameter displayed, Engine Hours will appear when power is reapplied to the instrument.

• Viewing CAN Parameters

All actively broadcast SAE J1939 CAN parameters implemented by the instrument are available for viewing. See "Implementation of SAE J1939 Parameters" on page 34. Press the Up or Down switch to find and view the desired parameter. The displayed parameter will not time out and remains displayed until a different parameter is selected for viewing or power is removed from the instrument.

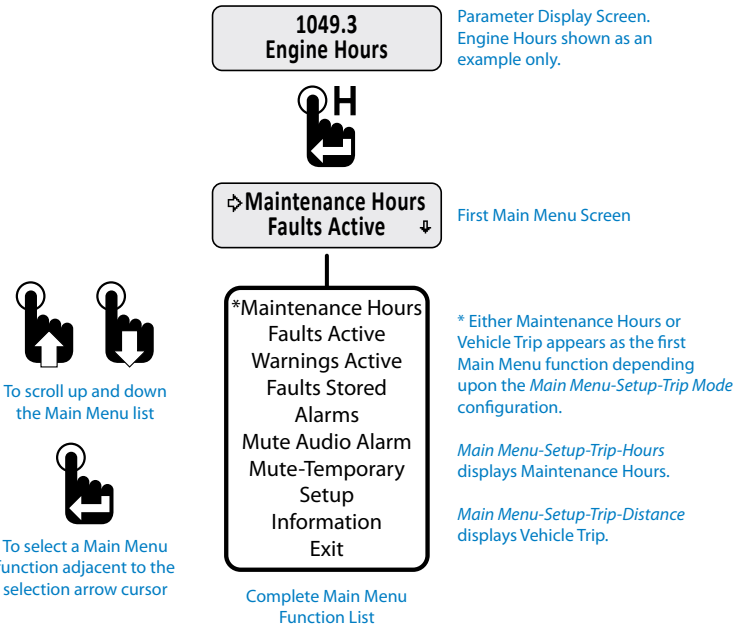
• Main Menu

The Main Menu contains functions to configure the LCD (Liquid Crystal Display), set alarms or view ECM faults and warnings. Access the Main Menu by pressing and holding the Menu/Enter/Reset switch for approximately three seconds while any CAN parameter screen is displayed.

Like all menus with multiple functions/options, only the first two Main Menu functions/options appear on the screen. Access the other functions/options by scrolling down the menu list using the Down switch. Use the Up switch to scroll back up the Main Menu function/option list.

The Main Menu and all the functions within it except Maintenance Hours and Vehicle Trip functions will display for approximately 30 seconds if no user activity is detected. The previously displayed parameter reappears after 30 seconds of inactivity.

Figure 1-3: Accessing the Main Menu

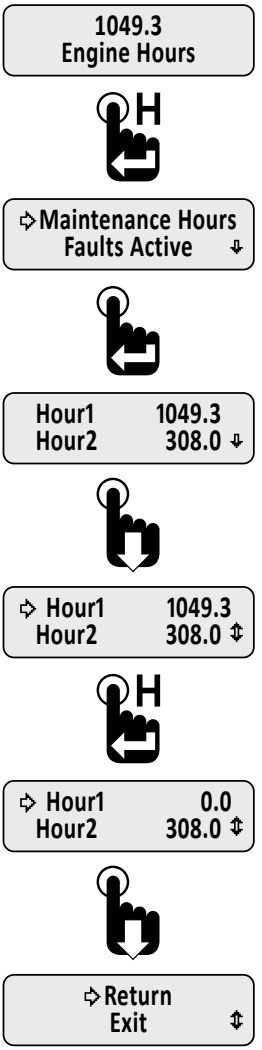


• Maintenance Hours or Vehicle Trip

Depending upon the configuration of the instrument, either Maintenance Hours or Vehicle Trip appears as the first Main Menu function. See "Trip Mode" on page 31 for setting hours or trip as the first Main Menu function.

The instrument provides two resettable maintenance hour and vehicle trip logs. The Maintenance Hours or Vehicle Trip function allows users to view and reset any of the hour or trip logs.

Figure 1-4: Accessing and Resetting Maintenance Hours and Vehicle Trip Logs



With a CAN parameter displayed, press and hold the Enter switch to open the Main Menu. Engine Hours CAN parameter shown as an example only.

First Main Menu screen appears with the selection arrow cursor next to Maintenance Hours. Press the Enter switch to display maintenance hour logs. Note: Instrument may be configured for vehicle trip instead of maintenance hours.

Maintenance hour log screen appears. Press Down switch to select an hour log.

Note: Maintenance Hour and trip log displays do not time out after 30 seconds and return the last CAN parameter displayed like most menu displays.

Selection arrow cursor appears next to Hour1 log. Press and hold Enter switch to reset Hour1 log or press the Down switch to place selection arrow cursor next to Hour2 log.

Hour1 log reset to zero.

Hour2 log may be reset by moving the selection arrow cursor down to Hour2 log then pressing and holding the Enter switch.

Scroll down to place the selection arrow cursor next to the Return option then press the Enter switch to access the Main Menu.

Scroll down to place the selection arrow cursor next to the Exit option then press the Enter switch to return to the last displayed CAN parameter screen.

• Faults Active

Faults are an indicator of a severe vehicle problem as reported by the ECM/ECU that warrants stopping the engine/vehicle/vessel. Users should consult the owners manual or a service technician to correct the fault condition or conditions.

When a fault condition occurs, the instruments internal audible alarm and Fault LED are activated. The internal audible alarm is temporarily muted by pressing the Enter switch.
An external audible device connected to output pin 3 of the six pin connector will also be muted if the setup option Alarm Output, *Main Menu-Setup-Alarm Output*, is set to Audio. See "Alarm Output" on page 32 to configure alarm output pin.

The *Main Menu-Faults Active* option allows users to view the parameter or parameters causing fault notification. If popups for fault conditions is enabled, a fault notification screen appears. Refer to "Setting Popups" on page 25.

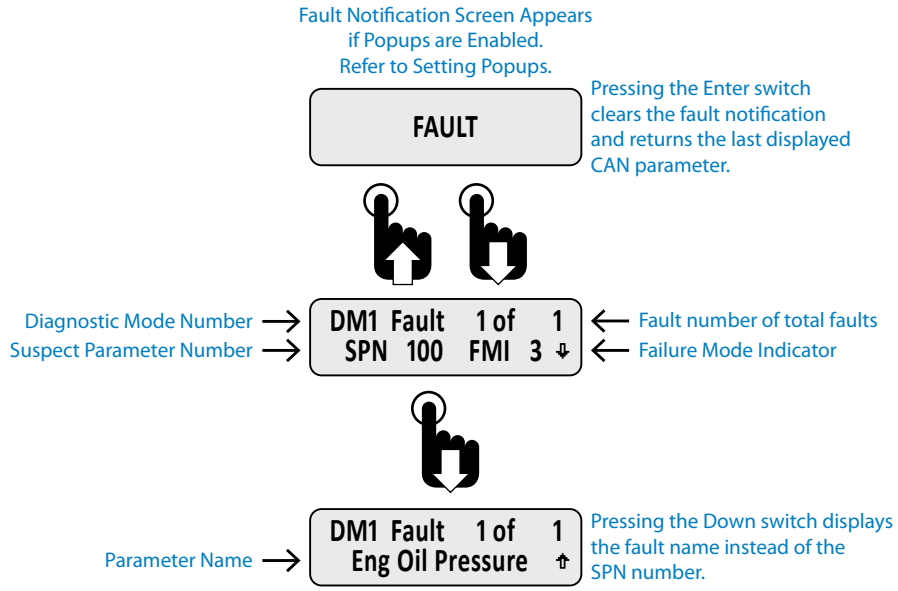
The Faults Active function within the Main Menu allows users to view details for all currently active faults.

Fault information includes the following:

DM1 (Diagnostic Message) for active faults or DM2 for stored faults
Fault number and total fault quantity, e.g., 1 of 3
SPN (Suspect Parameter Number) numerically identifies the parameter per the CAN protocol
FMI (Fault Mode Indicator) number to further identify the faults characteristic
Fault Name. Appears if the CAN parameter is implemented in the instruments firmware.
See"Implementation of SAE J1939 Parameters" on page 34

The active fault display will not time out after 30 seconds. Press the Enter switch to exit viewing faults and return to the Faults Active option of the Main Menu.

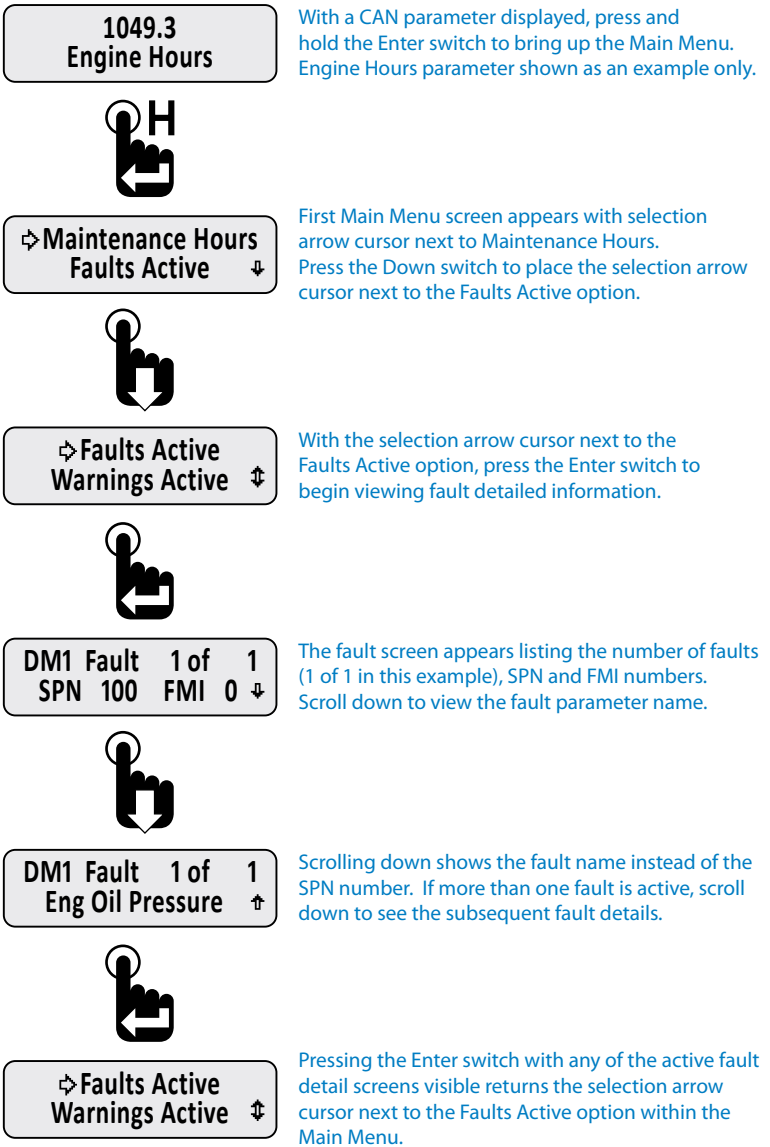
Figure 1-5: Fault Notification and Information Screens



• Viewing Active Faults

If a fault information screen is cleared after it initially appears and the fault is still active, users can view all the active fault information screens by using the Faults Active function of the Main Menu, *Main Menu-Active Faults*.

Figure 1-6: Viewing Active Faults



• Warnings Active

Warnings are an indicator of a vehicle problem as reported by the ECM/ECU that does not warrant immediately stopping the vehicle or vessel. Users should consult the owners manual or a service technician to correct the warning condition or conditions.

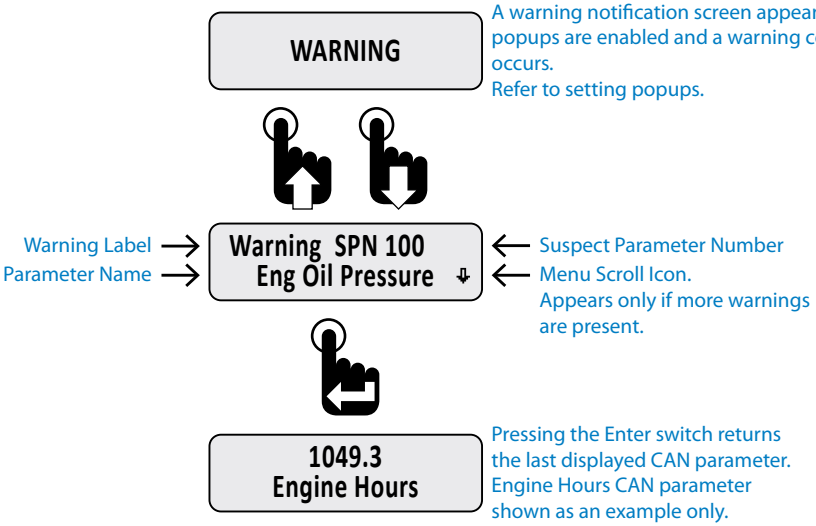
When a warning condition occurs, the instruments internal audible alarm and Warn LED are activated. The internal audible alarm may be temporarily muted by pressing the Enter switch.
An external audible device connected to output pin 3 of the six pin connector will also be muted if the setup option Alarm Output, *Main Menu-Setup-Alarm Output*, is set to Audio. See "Alarm Output" on page 32 to configure alarm output pin.

The *Main Menu-Warnings Active* option allows users to view the parameter or parameters causing the warning. If popups for warning conditions is enabled, a warning notification screen appears. Refer to "Setting Popups" on page 25.

The built-in audible device will sound when a warning condition occurs if the Mute setting, *Main Menu-Mute Audio Alarm*, is not set to Permanent. See "Mute" on page 20 for enabling the internal audible device.

The active warning display will not time out after 30 seconds. Press the Enter switch to exit viewing warnings and return to the Warnings Active option of the Main Menu.

Figure 1-7: Warning Notification and Information Screens



• Viewing Active Warnings

If a warning information screen is cleared after it initially appears and the warning is still active, users can view all the active warning information screens by using the Warnings Active function of the Main Menu, *Main Menu-Warnings Active*.

Figure 1-8: Viewing Active Warnings

With a CAN parameter displayed, press and hold the Enter switch to bring up the Main Menu. Engine Hours parameter shown as an example only.

First Main Menu screen appears with selection arrow cursor next to Maintenance Hours. Scroll down to place the selection arrow cursor next to the Warnings Active option.

Press the Enter switch with the selection arrow cursor next to the Warnings Active option to view all current system warnings.

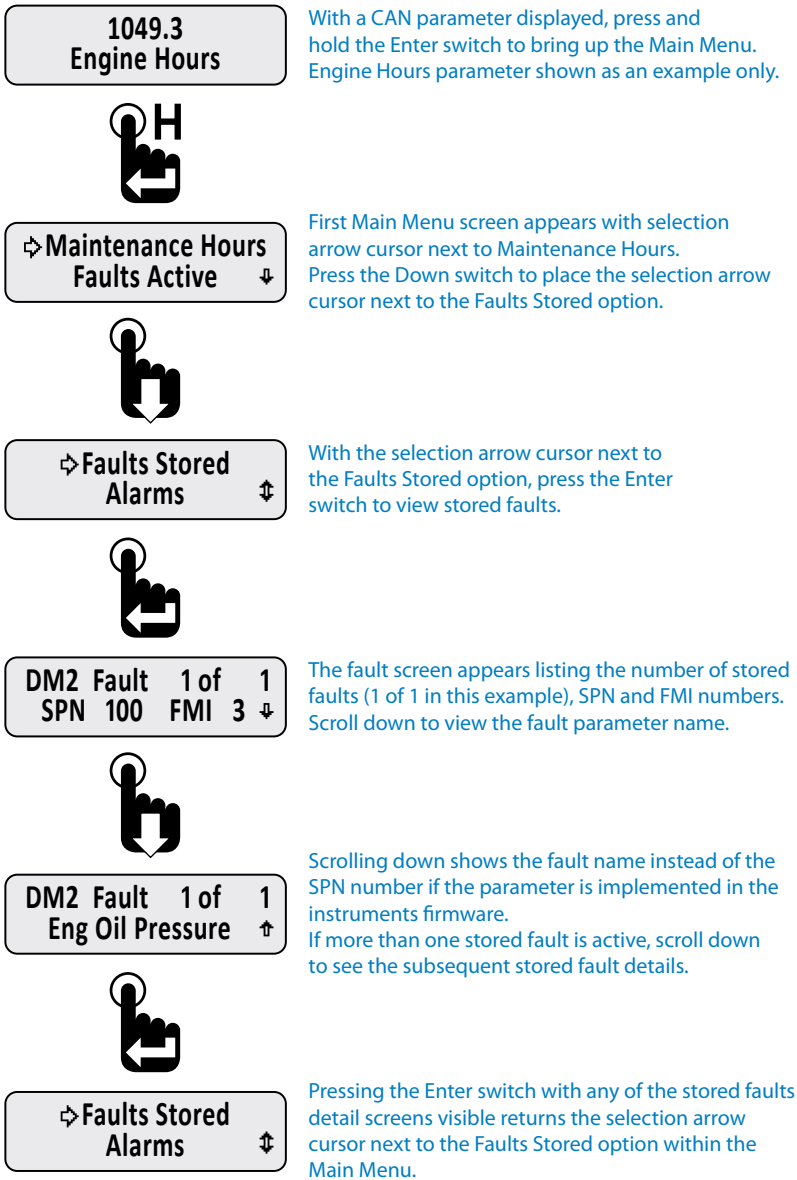
The warning detail screen appears if at least one warning is present. If multiple warnings are present, the menu scroll down icon appears. Scroll down to view other warnings or press the Enter switch to return to the Warnings Active option of the Main Menu.

Pressing the Enter switch with any of the active warnings detail screens visible returns the selection arrow cursor next to the Warnings Active option within the Main Menu.

• Faults Stored

The instrument will display all DM2 (Diagnostic Mode) faults stored by the ECU. DM2 faults are previously active diagnostic trouble codes.

Figure 1-9: Faults Stored Information Screens



With a CAN parameter displayed, press and hold the Enter switch to bring up the Main Menu. Engine Hours parameter shown as an example only.

First Main Menu screen appears with selection arrow cursor next to Maintenance Hours. Press the Down switch to place the selection arrow cursor next to the Faults Stored option.

With the selection arrow cursor next to the Faults Stored option, press the Enter switch to view stored faults.

The fault screen appears listing the number of stored faults (1 of 1 in this example), SPN and FMI numbers. Scroll down to view the fault parameter name.

Scrolling down shows the fault name instead of the SPN number if the parameter is implemented in the instruments firmware.
If more than one stored fault is active, scroll down to see the subsequent stored fault details.

Pressing the Enter switch with any of the stored faults detail screens visible returns the selection arrow cursor next to the Faults Stored option within the Main Menu.

• Alarms

Alarms are user configured limits for CAN parameters used to alert operators when the parameter or parameters exceeds those limits. Alarms help users protect a vehicle, vessel or equipment from damage by providing an option to set operating notification limits for CAN parameters critical to the application.

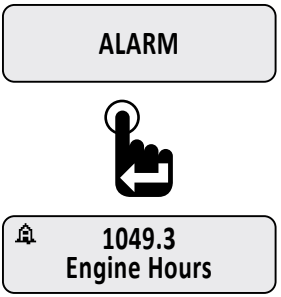
A maximum of 15 parameters may be configured for alarm notification.
Note: Alarms are only a notification feature and do not disable or diminish the operation of a vehicle or equipment.

Alarm settings are written to non-volatile memory and retained when power is removed from the instrument.

If alarms are configured and enabled, a blinking "Bell" icons appears in the upper left corner of the current CAN parameter display screen once a parameter exceeds the set alarm limits. If popups for alarm conditions is enabled, an alarm notification screen appears. Refer to "Setting Popups" on page 25.

The built-in audible device will sound when an alarm occurs if the Mute setting, *Main Menu-Mute Audio Alarm*, is not set to Permanent. See "Mute" on page 20 for enabling the internal audible device.

Parameter Display Screen with Alarm "Bell" Icon



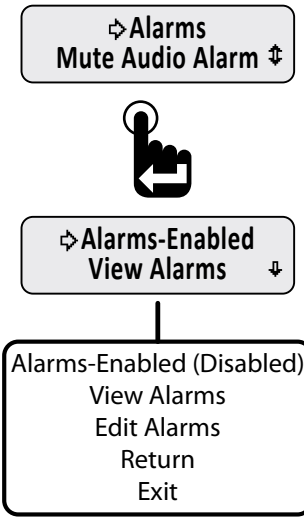
An alarm notification screen appears when popups are enabled and an alarm condition occurs. Refer to setting popups.

Pressing the Enter switch clears the alarm notification screen and returns the last displayed CAN parameter. A blinking bell icon appears in the upper left corner of the screen to indicate the alarm condition is still active.

• Alarms Menu

The *Main Menu-Alarms* function allows users to enable alarm notification, view the parameter or parameters causing the alarm, edit existing alarms and add new alarms.

Figure 1-10: Alarms Menu Functions



From the Main Menu, scroll to place the selection arrow cursor next to the Alarms option.
Press the Enter switch to open Alarms menu.

The Alarms menu appears with the selection arrow cursor next to the Alarms-Enabled or Disabled option.
Scroll down to view all Alarms menu functions.

Alarms Menu Function List.

Note: Pressing the Enter switch toggles between Alarms Enabled and Alarms-Disabled.

Alarm Menu function Summary:

Alarms-Enabled - Turns on all set alarms.
Alarms-Disabled - Turns off all set alarms.
View Alarms - Allows users to view all set alarm configurations.
Edit Alarms - Allows users to edit existing alarms, add new alarms or delete existing alarms.
Return - Brings users back to the Alarms option of the Main Menu.
Exit - Brings users back to the last displayed CAN parameter screen

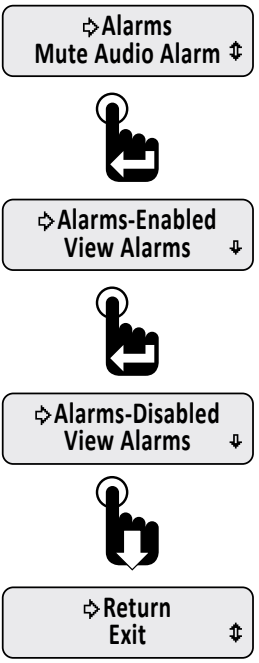
• Enabling/Disabling Alarms

Alarms-Enabled/Disabled turns on or off notification when an alarm condition occurs. This function does not delete alarms or their settings from the alarm list.

Enabling or disabling alarms is a toggle function. When the Alarm menu is opened the current setting, enabled or disabled, is shown. To change the current setting, simply press the Enter switch.

To protect against operating the vehicle unaware of potentially damaging conditions, always use caution when deciding to turn off alarm notification.

Figure 1-11: Enabling/Disabling Alarms



From the Main Menu, scroll to place the selection arrow cursor next to the Alarms option. Press the Enter switch to open the Alarms menu.

Depending upon the previous configuration of the instrument, the Alarms menu appears with either Alarms-Enabled or Alarms-Disabled as the current setting. This screen shows the instrument's current alarm configuration as enabled. Pressing the Enter switch toggles to Alarms-Disabled.

After pressing the enter switch, Alarms-Disabled appears. Pressing the Enter switch a second time will toggle back to Alarms-Enabled.

Scroll down to place the selection arrow cursor next to the Return option then press the Enter switch to leave the Alarms menu and return to the Main Menu.

Scroll down to place the selection arrow cursor next to the Exit option then press the Enter switch to leave the Alarms menu and view the last displayed CAN parameter.

• Viewing Alarms

View Alarms allows users to scroll through all CAN parameters configured for alarm notification.

Users are shown the alarm number, parameter name, measured value for the parameter and the alarm trigger conditions for the parameter.

Figure 1-12: Alarm Screen Details

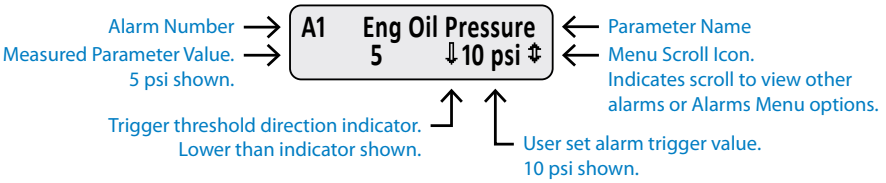


Figure 1-13: Viewing Alarms

From the Main Menu, scroll to place the selection arrow cursor next to the Alarms option.
Press the Enter switch to open the Alarms menu.

Once in the Alarms menu, scroll down to place the selection arrow cursor next to the View Alarms option.

With the selection arrow cursor next to the View Alarms option, press the Enter switch to view any current alarms.

The first configured alarm is displayed.
The display shows the alarm number, CAN parameter name (if implemented), current reading and alarm trigger settings (Below 10 psi in this example).

Scroll down to view any additional alarms.

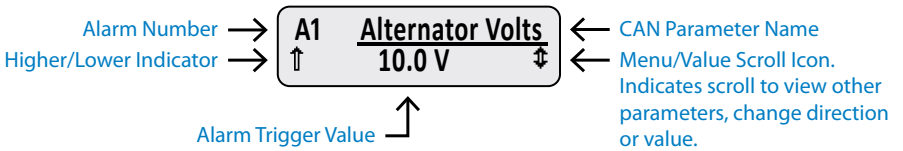
If no activity is detected for 30 seconds while viewing alarms, the previously displayed CAN parameter appears.
To manually stop viewing alarms, scroll down to place the selection arrow cursor next to the Return option then press the Enter switch to return to the Main Menu or select the Exit option to view the last displayed CAN parameter.

• Alarm Configuration

When adding a new alarm parameter or editing an existing alarm parameter with the Edit Alarms option, users must set the following:

1. The CAN parameter to use.
2. The trigger threshold direction (Higher or Lower than alarm trigger value).
3. The alarm trigger value.

Figure 1-14: Add & Edit Alarm CAN Parameter Screen Details



Higher than threshold indicator. Alarm notification occurs when measured parameter is higher than trigger value.

Lower than threshold indicator. Alarm notification occurs when measured parameter is lower than trigger value.

To select a CAN parameter, scroll through the parameter list with the Up and Down switches until the desired parameter appears. Press the Enter switch to add the parameter to the alarm list.

After selecting a parameter, the blinking bar cursor appears under the Higher/Lower than arrow icon. Users must choose if the alarm notification will occur when the actual parameter value is either higher or lower than the desired trigger value. Pressing either the Up or Down switch toggles the indicator between the higher than arrow (pointing up) and lower than arrow (pointing down). Press the Enter switch to accept direction of the arrow icon.

Once higher or lower is chosen, the blinking bar cursor moves to the alarm notification trigger value. The units of this value change depending on the type of parameter chosen. Use the Up or Down switches to change the value then press the Enter switch to accept the displayed value.

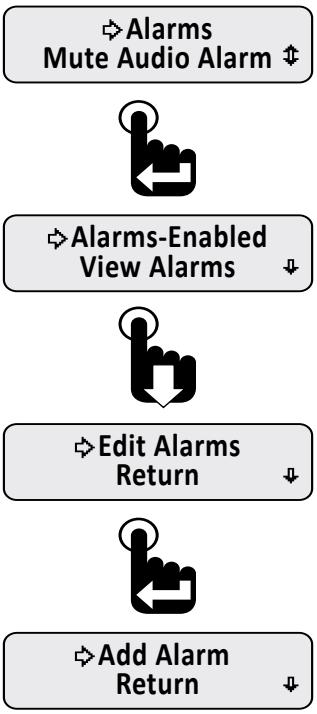
After configuring all the alarm parameters, users can choose to save or discard the alarm configuration.

• Adding an Alarm or Alarms

The Edit Alarms function is used to add CAN parameters for alarm notification.
Users may set up to 15 parameters for alarm notification.

The Edit Alarms menu screens differ if no alarms are set as compared to when previously configured alarms exist. If no previously configured alarms exist, the Add Alarm menu option appears after selecting Edit Alarms. If previously configured alarms exist, the configured alarms appear before the Add Alarm menu option. To add an additional alarm when previously alarms exist, users must scroll down thru all the previously configured alarms before reaching the Add Alarm menu option.

Figure 1-15: Menu Prompt Sequence with No Configured Alarms



From the Main Menu, scroll to place the selection arrow cursor next to the Alarms option.
Press the Enter switch to open Alarms Menu.

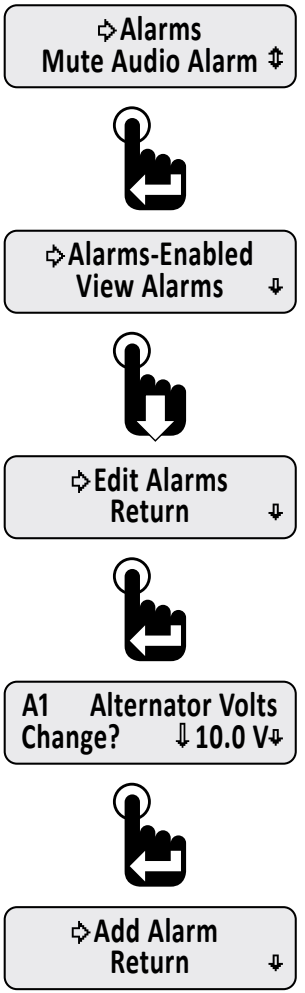
The Alarms Menu appears with the selection arrow cursor next to the Alarms-Enabled or Disabled option. Scroll down to place selection arrow cursor next to the Edit Alarms option.

With the selection arrow cursor next to the Edit Alarms option, press the Enter switch to begin editing alarms.

When no alarms exist, selecting Edit Alarms returns two menu options, Add Alarm and Return.

Press the Enter switch to begin adding a CAN parameter for alarm notification or select Return to bring back the Edit Alarms menu option.

Figure 1-16: Menu Prompt Sequence with Previously Configured Alarms



From the Main Menu, scroll to place the selection arrow cursor next to the Alarms option.
Press the Enter switch to open Alarms Menu.

The Alarm menu appears with the selection arrow cursor next to the Alarms-Enabled or Disabled option.
Scroll down to place selection arrow cursor next to Edit Alarms option.

With the selection arrow cursor next to the Edit Alarms option, press the Enter switch to begin editing alarms.

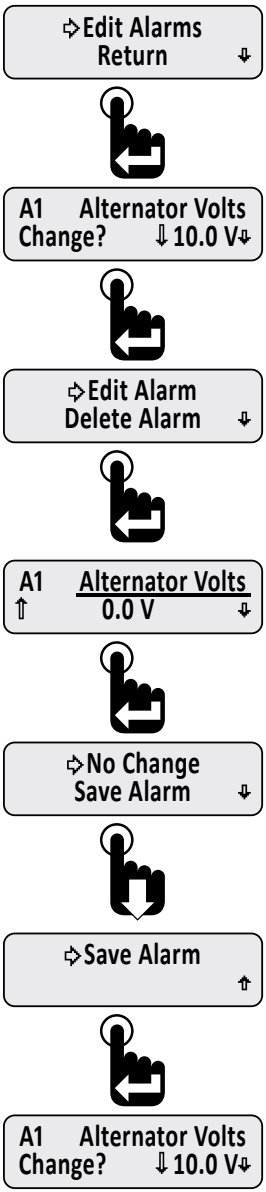
When a previously configured alarm or alarms exists, they will appear after selecting Edit Alarms.
Scroll down thru all the previously configured alarms to reach the Add Alarm menu function.

Press the Enter switch to add a new alarm or select Return to bring back the Edit Alarms menu option.

• Editing Alarms

The Edit Alarms function is used to change an alarms existing CAN parameter, higher/lower than threshold indicator or trigger value.

Figure 1-17: Editing an Alarm



From the Alarms Menu place the selection arrow cursor next to the Edit Alarms option, *Main Menu-Alarms-Edit Alarms*, then press the Enter switch to begin editing alarms.

Pressing the Enter switch displays the first previously configured CAN parameter for alarm notification, A1.

The prompt "Change?" appears in the lower left corner of the display. Press the Enter switch to accept the prompt to change/edit the the displayed alarm, A1.

If more than one alarm exists, scroll down to display the desired alarm then press the Enter switch to change/edit it.

After choosing an alarm to change, the selection arrow cursor appears next to the Edit Alarm, option.
Press the Enter switch to begin editing the chosen alarm.

The alarms configuration screen appears with the blinking bar cursor beneath the CAN parameter name.

Step through and edit the parameter name, threshold direction and trigger value as desired using the Up and Down switches. Pressing the Enter switch accepts and sets any changes.

Pressing the Enter switch after accepting the existing or edited trigger value opens the save options menu choices.

To discard changes to the alarm, press the Enter switch to select No Change. Otherwise, scroll down to place the selection arrow cursor next to the Save Alarm option.

With the selection arrow cursor next to the Save Alarm option, press the Enter switch to save alarm changes.

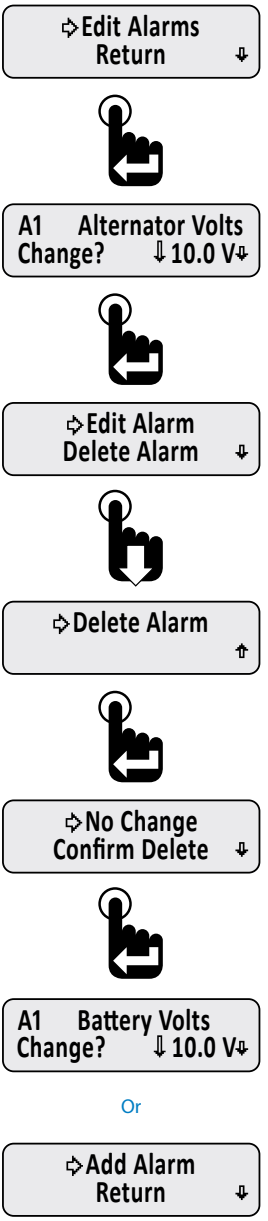
After choosing to either save or discard alarm changes, the same alarm configuration screen appears to allow users to re-edit the alarm if necessary.

Once the displayed alarm configuration is acceptable, press the Down switch to scroll to the next alarm if one is configured or to the Add Alarm and Return menu options.

• Deleting Alarms

The Edit Alarms function is also used to delete existing alarms.

Figure 1-18: Deleting an Alarm



From the Alarms Menu place the selection arrow cursor next to the Edit Alarms option, *Main Menu-Alarms-Edit Alarms*, then press the Enter switch to begin editing alarms.

Pressing the Enter switch displays the first previously configured CAN parameter for alarm notification, A1.

The prompt "Change?" appears in the lower left corner of the display. To delete the displayed alarm configuration, press the Enter switch to accept the prompt to change the alarm. Otherwise, press the down switch until the desired alarm to delete appears on the display then press the Enter switch to accept the change prompt.

After choosing the displayed alarm to delete, the selection arrow cursor appears next to the Edit Alarm option.
Press the Down switch to place the selection arrow cursor next to the Delete Alarm option then press the Enter switch.

With the selection arrow cursor next to the Delete Alarm option, press the Enter switch.

After selecting Delete Alarm, users must either cancel the delete request by selecting No Change or confirm the deletion by selecting Confirm Delete.

If No Change is selected above, the previously displayed Alarm configuration screen appears.

If Confirm Delete is selected, the next configured alarm appears.

If no other alarms were configured, the Add Alarm and Return menu options appear.

• Mute

The instrument is equipped with an internal audible device to alert users when a Fault, Warning or Alarm condition occurs. Pressing the Enter switch after a Fault, Warning or Alarm condition occurs either temporarily or permanently mutes the audible device for that condition depending upon the setting of Mute Audio Alarm, *Main Menu-Mute Audio Alarm*.

Note: Regardless of the Mute Audio Alarm setting, the first occurrence of a Fault, Warning or Alarm condition always activates the audio alarm. Subsequent occurrences of the same Fault, Warning or Alarm condition is controlled by the Mute Audio Alarm setting.

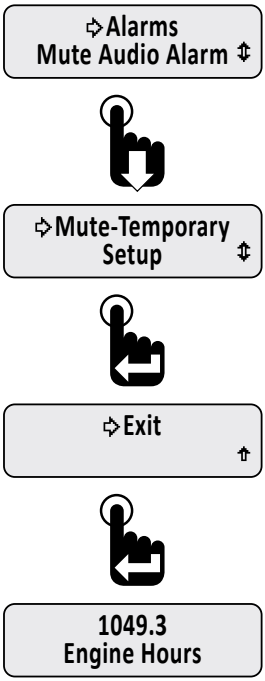
If an external audible device is connected to the switched output pin 3 of the connector, the device is muted as well. For muting external devices, see "Alarm Output" on page 32.

Mute Audio Alarm - Permanent setting turns off the audible device for subsequent occurrences of the specific Fault, Warning or Alarm.

Mute Audio Alarm - Temporary setting disables the audible device for twenty seconds.

Faults are muted for 20 seconds. Warnings and Alarms are muted for 2 minutes. Faults are muted for a shorter period of time because they are considered critical conditions that require immediate attention. A Fault condition sounds a steady audible tone while Warning and Alarms conditions sound an intermittent audible tone.

Figure 1-19: Muting Faults, Warnings & Alarms



From the Main Menu, scroll to place the selection arrow cursor next to the Mute Audio Alarm option, *Main Menu-Mute Audio Alarm*.

When the selection arrow cursor is placed next to the Mute Audio Alarm option, the name changes to Mute and the current state, i.e., Mute-Temporary or Mute-Permanent. Pressing the Enter switch toggles between the two settings. The setting is automatically saved once changed.

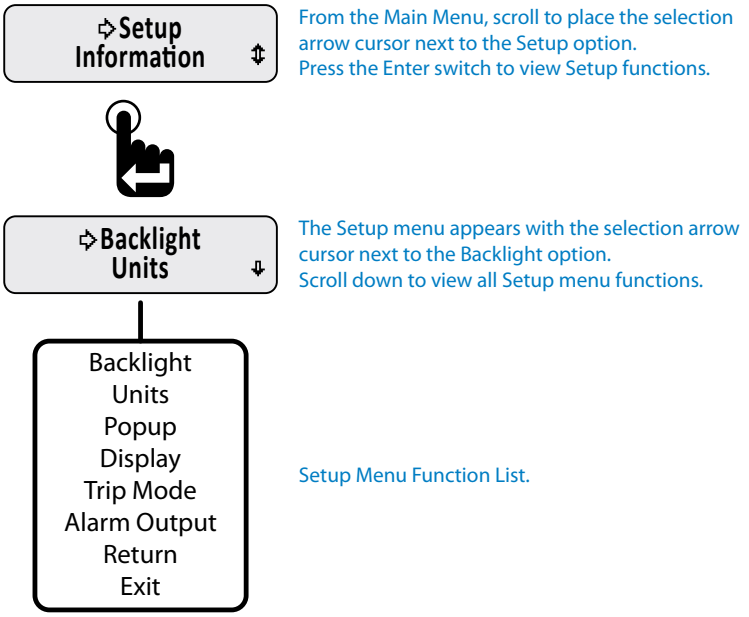
After setting the mute status, scroll down to the Exit option then press the Enter switch to return to the last displayed CAN parameter or simply wait 30 seconds for the last displayed CAN parameter to appear.

Last displayed CAN parameter appears.
Engine Hours parameter shown as an example only.

• Setup Menu

The Setup Menu contains all the functions necessary to configure the instrument to satisfy user preferences and application requirements. This section of the manual describes those functions.

Figure 1-20: Setup Menu Functions



Setup Menu function summary:

Backlight - Sets intensity of instrument illumination.
Units - Sets display units to English or SI-Metric.
Popup - Activates notification screen for Faults, Warnings and Alarms.
Display - Sets either 1 or 2 parameter display mode, LCD contrast and positive or negative image mode.
Trip Mode - Determines if maintenance hours or trip miles displays as the first item of the Main Menu.
Alarm Output - Turns off (mutes) the output for audible devices.
Return - Brings users back to *Main Menu-Setup*.
Exit - Leaves the menu to show the last displayed CAN parameter.

• Backlight

The instrument offers two levels of illumination control; external lamp switch on and lamp switch off. Backlight intensity is set using the Backlight option from the Setup Menu, *Main Menu-Setup-Backlight*. Backlight intensity values range from 0 or off to 100% or maximum by increments of 10%.

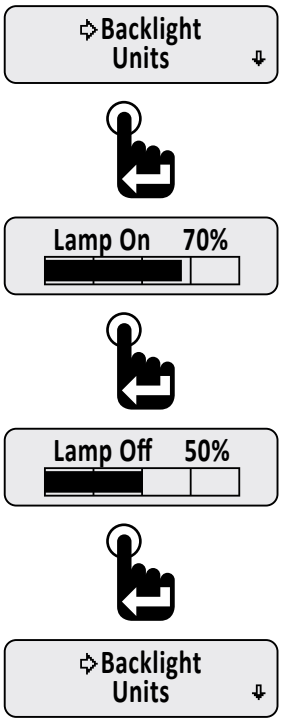
• Lamp On & Lamp Off

Lamp On: The Lamp On function sets the backlight illumination brightness when pin 4 of the instrument's 6 pin connector is wired to an external lamp switch and that switch is turned on.

Lamp Off: The Lamp Off function sets the backlight illumination brightness when no external lamp switch is used or when an external lamp switch is wired to pin 4 of the instruments 6 pin connector and the lamp switch is turned off. This feature allows users to turn on and control the instruments backlighting independent of the vehicle's or equipment's light switch.

Note: Standard factory hardware configuration for the instrument uses Pin 4 of the 6 pin connector to connect to an external lamp switch. Some factory configured instruments use pin 4 for serial data communication to Beede NexSysLink® instruments. See "Stand-Alone and Master Node Configurations" on page iv for more information.

Figure 1-21: Setting Backlight Intensity



From the Setup Menu place the selection arrow cursor next to Backlight, *Main Menu-Setup-Backlight*, then press the Enter switch to begin adjusting the LCD backlight intensity.

Lamp On backlight intensity bar graph appears.
Use the Up and Down switches to increase or decrease the Lamp On backlight intensity.
Press the Enter switch to accept the value.

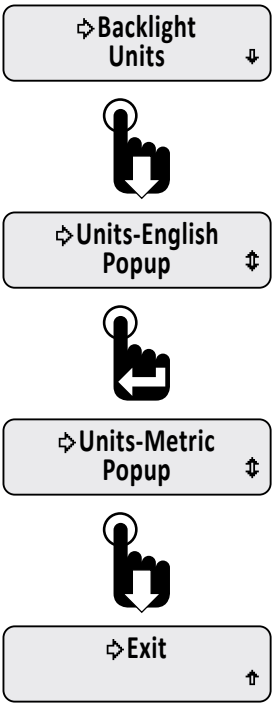
After setting the Lamp On backlight intensity, the Lamp Off backlight intensity screen appears.
Use the Up and Down switches to increase or decrease the Lamp Off backlight intensity.
Press the Enter switch to accept the value.

Once the Lamp Off backlight intensity is set, the Backlight option of the Setup menu appears.
Scroll down to exit the Setup Menu or wait 30 seconds for the last displayed CAN parameter to appear.

• Setting Units

Users may select to display CAN parameters in either English or SI-Metric units.

Figure 1-22: Setting Units



From the Setup menu, scroll to place the selection arrow cursor next to the Units option, *Main Menu-Setup-Units*.

When the selection arrow cursor is placed next to the Units option, the name changes to Units and the current setting, i.e., Units-English or Units-Metric.
Pressing the Enter switch toggles between the two settings.
The setting is automatically saved once changed.

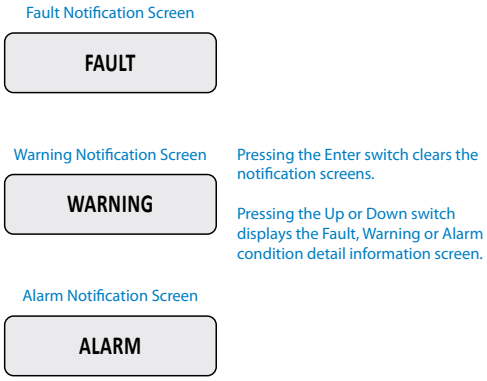
Pressing the Enter switch toggles the units to Metric.
Press the Enter switch to toggle the units back to English.

Scroll down to the Exit option and press the Enter switch or wait 30 seconds for the last displayed CAN parameter to appear.

• Popups Notification Screens

Turning on popups provide a highly visible alert screen when a system Fault, Warning or Alarm occurs.

Figure 1-23: Popup Fault, Warning & Alarm Screens



Fault, Warning and Alarm popup screens remain displayed until acknowledged by pressing the Enter switch. Pressing the Enter switch returns the last displayed CAN parameter prior to the occurrence of the Fault, Warning or Alarm condition.

For Faults and Warnings, the Fault LED and Warning LED remain illuminated after pressing the Enter switch to acknowledge and clear the notification screen.

After pressing the Enter switch for Alarms, a blinking "bell" icon appears in the upper left corner of the CAN parameter display screen to indicate an alarm condition exists.

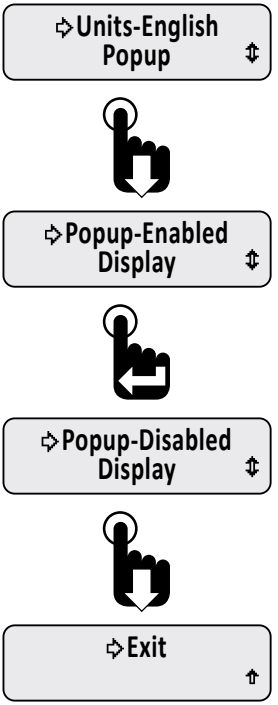
Pressing the Up or Down switch when a notification screen appears brings up the Fault, Warning or Alarm detail information display.

Note: If the condition that caused the Fault, Warning or Alarm clears, the notification screens and bell icon disappears and the alert LEDs turn off.

• Setting Popups

Enabling popups allows the Fault, Warning and Alarm screens to appear when a when a System Fault, Warning or Alarm condition occurs.

Figure 1-24: Setting Popup Status



From the Setup menu, scroll to place the selection arrow cursor next to the Popup option, *Main Menu-Setup-Popup*.

When the selection arrow cursor is placed next to the Popup option, the name changes to Popup and the current setting, i.e., Popup-Enabled or Popup-Disabled. Pressing the Enter switch toggles between the two settings. The setting is automatically saved once changed.

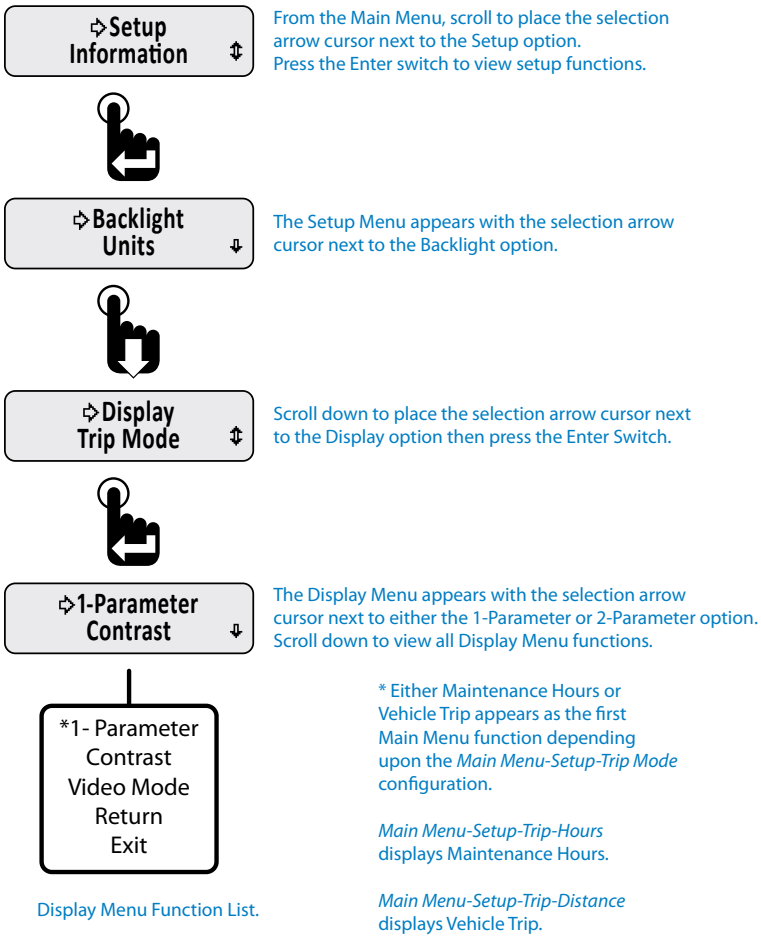
Pressing the Enter switch toggles the popup setting to disabled. Press the Enter switch to toggle the units back to enabled.

Scroll down to the Exit option and press the Enter switch or wait 30 seconds for the last displayed CAN parameter to appear.

• Display

The Display Menu functions provide users the ability to configure the LCD. Options for configuring the display include either 1 or 2 parameter display mode, LCD contrast and positive or negative image mode. Each function is detailed in the following pages.

Figure 1-25: Display Menu



• 1 or 2 Parameter Display

Users can set whether 1 or 2 CAN parameters appear on the LCD screen.

Figure 1-26: 1 and 2 CAN Parameter Display Formats

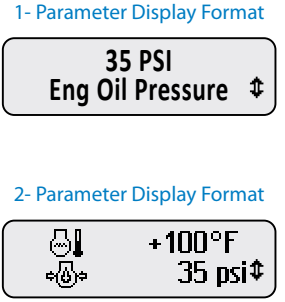
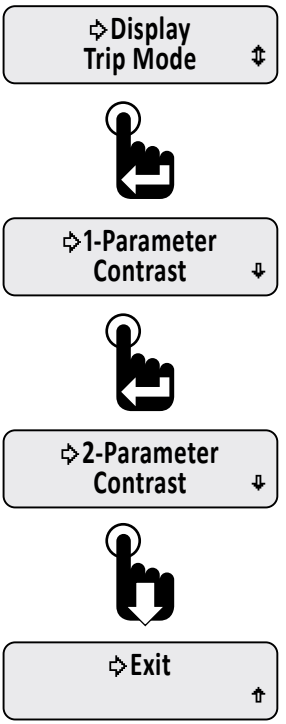


Figure 1-27: Setting 1 or 2 Parameter Display Lines



From the Setup Menu place the selection arrow cursor next to the Display option, *Main Menu-Setup-Display*, then press the Enter switch to view the Display Menu functions.

When the Display Menu opens, the selection arrow appears next to the current parameter display mode setting, i.e., 1-Parameter or 2-Parameter.
Pressing the Enter switch toggles between the two settings. The setting is automatically saved once changed.

Pressing the Enter switch toggles the paramater display mode to two 2-Parameter.

Scroll down to the Exit option and press the Enter switch or wait 30 seconds for last displayed CAN parameter to appear.

• Set Contrast

Contrast sets the difference between the white and black colors of the LCD.

Figure 1-28: Setting LCD Contrast

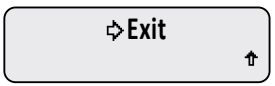
From the Setup Menu place the selection arrow cursor next to the Display option, *Main Menu-Setup-Display*, then press the Enter switch to view the Display menu functions.

The first two Display Menu functions appear. Scroll to place the selection arrow cursor next to the Contrast option.

With the selection arrow cursor next to the Contrast option, press the Enter switch to open the contrast adjustment screen.

The contrast adjustment screen appears.
Use the Up and Down switches to increase or decrease the contrast percent. Press the Enter switch to accept the displayed contrast value.

After setting the contrast value, the selection arrow cursor appears next to the Contrast option of the Display Menu, *Main Menu-Setup-Display-Contrast*.



Scroll down to the Exit option and press the Enter switch or wait 30 seconds for the last displayed CAN parameter to appear.

• Video Mode Formats

Setting the video mode changes the color scheme of the LCD from white graphics on a black background (Normal) to black graphics on a white background (Reverse).

Figure 1-29: Video Mode Formats

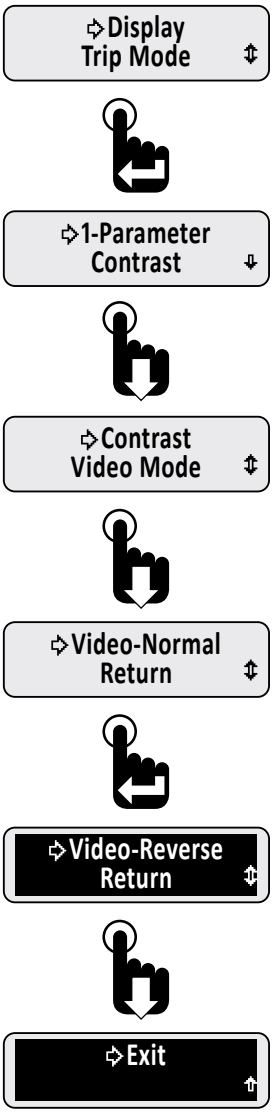
LCD Normal Video Mode

LCD Reverse Video Mode

• Set Video

The menu sequence below shows how to set the video mode to either normal or reverse.

Figure 1-30: Setting LCD Background Color Scheme (Video Mode)



From the Setup Menu place the selection arrow cursor next to the Display option, *Main Menu-Setup-Display*, then press the Enter switch to view the Display Menu functions.

The first two Display Menu functions appear. Scroll to place the selection arrow cursor next to the Video Mode option.

Screen shows Video Mode function prior to placing the selection arrow cursor next to the function.
Continue to press the Down switch to place the selection arrow cursor next to the Video Mode function.

When the selection arrow cursor is placed next to the Video-Mode option, the name changes to the current video display mode, i.e., Video-Normal or Video-Reverse.
Pressing the Enter switch toggles between the two settings.
The setting is automatically saved once changed.

Pressing the Enter switch toggled the video mode to the reverse setting.
The setting is automatically saved once changed.

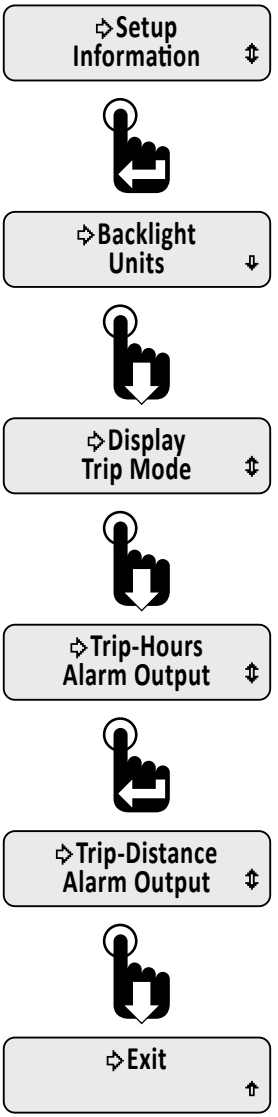
Scroll down to the Exit option and press the Enter switch or wait 30 seconds for the last displayed CAN parameter to appear.

• Trip Mode

The Trip mode setting determines whether distance or hours appear as the first item upon entering the Main Menu.

The decision to set the Trip Mode function to either hours or distance depends upon which of the two parameters is viewed more frequently in the application.

Figure 1-31: Setting Hours or Miles for Main Menu Display

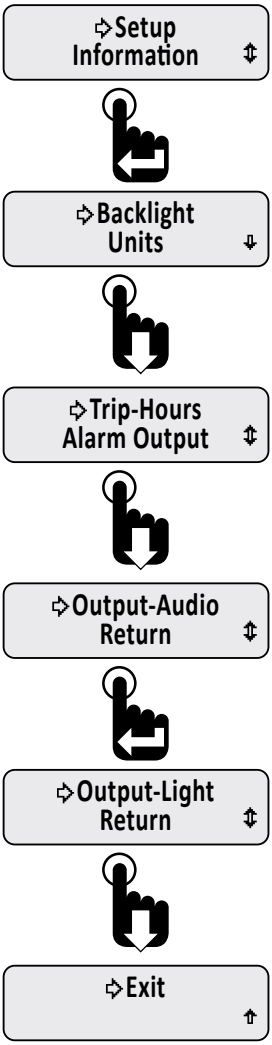


• Alarm Output

The alarm output setting controls whether the alarm output pin is turned off when an alarm condition occurs and the Enter switch is pressed. This function is also dependant upon the Mute setting for the audible output.

If Mute is set to Temporary and Alarm Output is set to Audible, the internal and external audible devices will temporarily turn off. If Mute is set to Permanent and the Alarm Output is set to Audible, the internal and external audible devices will remain off until a new alarm condition occurs.
If Alarm Output is set to light, the output pin remains on regardless of the current mute setting when the Enter switch is pressed.

Figure 1-32: Setting Alarm Output Pin Status



From the Main Menu, scroll to place the selection arrow cursor next to the Setup option.
Press the Enter switch to view the Setup Menu functions.

The Setup Menu appears with the selection arrow cursor next to the Backlight option.
Scroll down to place the selection arrow cursor next to the Alarm Output option.

Screen shows Alarm Output function prior to placing the selection arrow cursor next to the function.
Continue to press the Down switch to place the selection arrow cursor next to the Alarm Output function.

When the selection arrow cursor is placed next to the Alarm Output option, the name changes to the current alarm output mode, i.e., Output-Audio or Output-Light.
The Audio option disables output pin 3 when the Enter switch is pressed to mute an alarm notification.
Pressing the Enter switch toggles between the two settings.
The setting is automatically saved once changed.

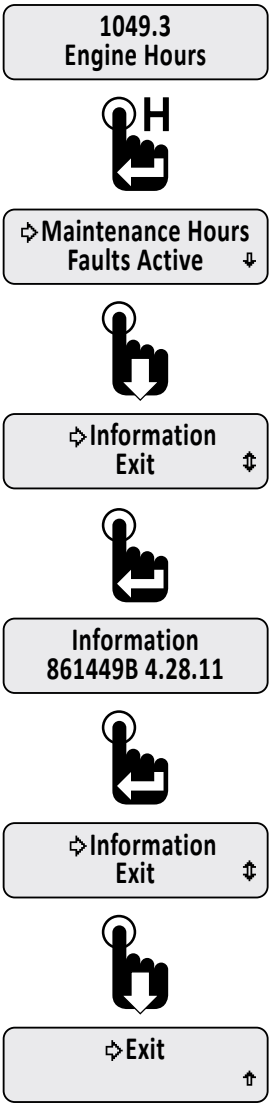
Pressing the Enter switch toggled the Alarm Output setting to the light option.
The Output-Light option does not disable output pin 3 when the Enter switch is pressed to mute an alarm notification.

Scroll down to the Exit option and press the Enter switch or wait 30 seconds for last displayed CAN parameter to appear.

• Firmware Information

Firmware part number, revision and release date are available when selecting the Information option from the Main Menu.

Figure 1-33: Viewing Firmware Revision



With a CAN parameter displayed, press and hold the Enter switch to open the Main Menu.
Engine Hours parameter shown as an example only.

First two Main Menu options appear with the selection arrow cursor next to the Maintenance Hours option.
Note: Instrument configuration may show vehicle trip.

Scroll down to place the selectio arrow cursor next to the Information option of the Main Menu.
Press the Enter switch to view firmware information.

The information screen displays the firmware part number, revision and release date.
Press the Enter switch to exit the information display or wait 30 seconds for the last displayed CAN parameter to appear.

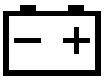
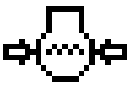
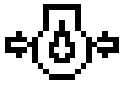
Pressing the Enter switch returns the Information Main Menu option.

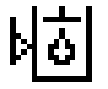
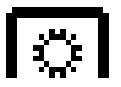
Scroll down to the Exit option and press the Enter switch or wait 30 seconds for the last displayed CAN parameter to appear.

• Implementation of SAE J1939 Parameters

Parameter Name	SPN	PGN	Range	LCD Display Name
Accelerator Pedal Position 1	91	61443	0-100%	Accel Pedal %
Charging System Potential	167	65271	0-50 Volts	Alternator
Engine Average Fuel Economy	185	65266	0-200 MPG	Avg Fuel Econ
Net Battery Current	114	65271	-125 - 125 Amps	Battery Curr
Battery Potential/Power Input 1	168	65271	0-50 Volts	Battery Volt
Engine Intake Manifold #1 Pressure	102	65270	0-72 PSI	Boost Press
Aftertreatment 1 SCR Catalyst Tank Level	1761	65110	0-100%	Cat Tank Lvl
Aftertreatment 1 SCR Catalyst Tank Temperature	3031	65110	-40 - 400 ºF	Cat Tank Temp
Engine Coolant Level	111	65263	0-100%	Coolant Level
Engine Coolant Pressure	109	65263	0-72 PSI	Coolant Press
Engine Coolant Temperature	110	65262	0-400 ºF	Coolant Temp
Transmission Current Gear	523	61445	-6 - 30 Position	Current Gear
Engine Oil Level	98	65263	0-100%	Eng Oil Level
Engine Oil Pressure	100	65263	0-140 PSI	Eng Oil Press
Engine Oil Temperature 1	175	65262	0-500 ºF	Eng Oil Temp
Engine Total Hours of Operation	247	65253	0-999999 Hours	Engine Hours
Engine Speed	190	61444	0-10,000 RPM	Engine Speed
Engine Exhaust Gas Temperature	173	65270	0-3000 ºF	Exh Gas Temp
Engine Instantaneous Fuel Economy	184	65266	0-200 MPG	Fuel Economy
Fuel Level 1	96	65276	0-100%	Fuel Level 1
Fuel Level 2	38	65276	0-100%	Fuel Level 2
Engine Fuel Delivery Pressure	94	65263	0-140 PSI	Fuel Pressure
Engine Fuel Rate	183	65266	0-40 GPH	Fuel Rate
Engine Fuel Temperature 1	174	65262	0-400 ºF	Fuel Temp
High Resolution Total Vehicle Distance	917	65217	0-999999 Miles	HR Vehicle D
Hydraulic Oil Level	2602	65128	0-100 PSI	Hydr Oil Lvl
Hydraulic Temperature	1638	65128	0-400 ºF	Hydraulic Temp
Engine Intercooler Temperature	52	65262	0-400 ºF	Intrcoolr Tmp
Engine Intake Manifold 1 Temperature	105	65270	0-400 ºF	Manifold Temp
Engine Percent Load At Current Speed	92	61443	0-120%	Percent Load
Power Takeoff Oil Temperature	90	65264	0-400 ºF	PTO Oil Temp
Power Takeoff Speed	186	65264	0-8000 RPM	PTO Speed
Wheel-Based Vehicle Speed	84	65265	0-200 MPH	Speed
Engine Throttle Position	51	65266	0-100%	Throttle
Transmission Oil Level	124	65272	0-100%	Trans Oil Lvl
Transmission Oil Pressure	127	65272	0-500 PSI	Trans Oil Prs
Transmission Oil Temperature	177	65272	0-500 ºF	Trans Oil Tmp
Total Vehicle Distance	245	65248	0-999999 Miles	Vehicle Dist

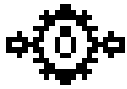
• Parameter Icons & Descriptions

Parameter Icon	Description
	Accelerator Pedal Position
	Alternator Current or Voltage
	Average Fuel Economy
	Battery Voltage or current
	Boost Pressure
	Engine Coolant Level
	Engine Coolant Pressure
	Engine Coolant Temperature
	Engine Exhaust Temperature
	Engine Intercooler Temperature
	Engine Manifold Temperature
	Engine Oil Level
	Engine Oil Pressure
	Engine Oil Temperature

Parameter Icon	Description
	Engine RPM/Speed
	Fuel Level
	Fuel Level 2
	Fuel Pressure
	Fuel Rate/Flow Total
	Fuel Temperature
	Hydraulic Oil Level
	Hydraulic Retarder Oil Temperature
	Instantaneous Fuel Economy
	Percent Load
	Power Takeoff Oil Pressure
	Power Takeoff Oil Temperature
	Power Takeoff Speed
	Speed, Wheel or Water Based

• Parameter Icons & Descriptions

Parameter Icon	Description
	Throttle Position
	Total Engine Hours
	Total Vehicle Distance

Parameter Icon	Description
	Transmission Gear/ Actual Gear/Current Gear
	Transmission Oil Pressure
	Transmission Oil Temperature

• Menu Navigation Icon Descriptions

Menu Navigation Icon	Description
	Alarm Indicator (Blinks)
	Selection Arrow Cursor
	Blinking Bar Cursor (Shown under number 0, zero)

Menu Navigation Icon	Description
	No CAN Data Present
	Higher Than Alarm Threshold Indicator
	Lower Than Alarm Threshold Indicator

• Notes

WARRANTY

Beede Electrical Instrument Co., Inc warrants all instruments and accessories free from all defects in workmanship and materials on gauges that are less than three (3) years old or have been in service fewer than two (2) years and, at no charge, will replace or repair at Beede's option all instruments that fail.
Contact Beede for complete details.

THANK YOU!

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