

Product Manual

Pump Display & Control Panel J1939 Engines



Part Number: C3-G8357-AS

Revision: 1.0

Customer: Power Solutions International

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PRIOR TO STARTING ENGINE

Prior to starting the engine, select the required START/STOP and THROTTLE settings. Reference the tables below to determine the appropriate operating modes. Details on each setting are provided on the following pages.

MANUAL OPERATION SETTINGS

| # | Start/Stop Mode | Throttle Mode | Throttle Description |
|---|------------------|---------------|--|
| 1 | Manual Key Start | TSC Vernier | UP and DOWN via panel buttons (set min and max speeds) |
| 2 | Manual Key Start | Multistate | UP and DOWN via panel buttons (up to four separate operating speeds) |
| 3 | Manual Key Start | Flex Analog | Speed is based on an analog signal driven to the controller from a 0-5V or 4-20mA sender |

AUTOMATIC OPERATION SETTINGS (Key in Auto Position)

| # | Start/Stop Mode | Throttle Mode | Throttle Description |
|---|---------------------|------------------------|--|
| 3 | Floats (AUTO START) | Single Speed | Select warm up, prime, operating and cool down speeds |
| 4 | Floats (AUTO START) | Linear (Analog Limits) | Engine speed adjusts between selected min and max speeds in relation to selected min and max transducer percentage |
| 6 | Transducer | Single Speed | Select warm up, prime, operating and cool down speeds |
| 7 | Transducer | Linear (Analog Limits) | Engine speed adjusts between selected min and max speeds in relation to selected min and max transducer percentage |

MANUAL THROTTLE SETTINGS

The following **bolded** settings are required for manual throttle operation in the ***Throttle Configuration menu***.

TSC VERNIER THROTTLE (DEFAULT)

Vernier throttle is standard up and down throttle between the minimum and maximum selections. The ramp rate is the rate of acceleration in rpm's per second. The control panel uses J1939 throttle, also called "torque speed control" or TSC1.

| Throttle Configuration Menu | Throttle Type - Throttle Type Selection (Default = Vernier) |
|-----------------------------|---|
| | TSC Mode Selection |
| | TSC Min Speed Selection (Default = 800 rpm) |
| | TSC Max Speed Selection (Default = 2400 rpm) |
| | TSC Bump Speed Selection (Default = 20 rpm) |
| | TSC Ramp Rate Selection (Default = 100 rpm/sec) |
| | Throttle Curve Selection |
| | Multistate Speed 1 Selection |
| | Multistate Speed 2 Selection |
| | Multistate Speed 3 Selection |
| | Multistate Speed 4 Selection |

FLEX ANALOG THROTTLE

Flex Analog throttle provides for adjustment of the operating speeds based on an analog signal driven into the controller from a 0-5V or 4-20mA sender.

| Throttle Configuration Menu | Throttle Type - Throttle Type Selection (Select Flex-Analog) |
|-----------------------------|--|
| | TSC Mode Selection |
| | TSC Min Speed Selection (Default = 800 rpm) |
| | TSC Max Speed Selection (Default = 2400 rpm) |
| | TSC Bump Speed Selection (Default = 20 rpm) |
| | TSC Ramp Rate Selection (Default = 100 rpm/sec) |
| | Throttle Curve Selection |
| | Multistate Speed 1 Selection |
| | Multistate Speed 2 Selection |
| | Multistate Speed 3 Selection |
| | Multistate Speed 4 Selection |

AUTOMATIC THROTTLE SETTINGS

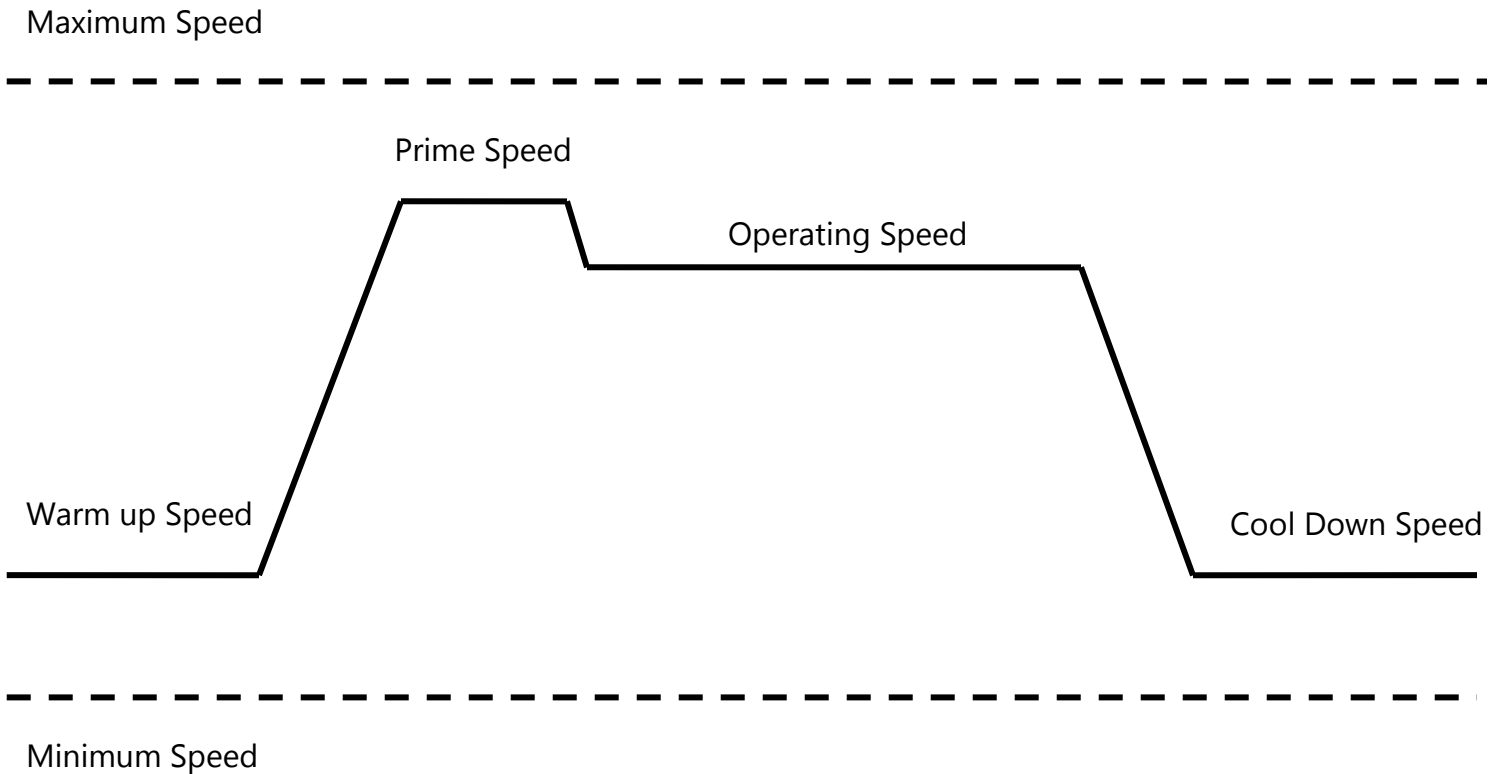
The following auto start/stop throttle options are available for when the key is placed in the AUTO position:

NOTE: The Target throttle setting in Auto Operations Settings is *not available* for this control panel.

SINGLE SPEED (PROFILE) THROTTLE

Single speed allows the engine to run according to a predetermined speed profile. Select the desired engine speed for the following:

- 1) Warm Up Speed
- 2) Prime Speed (Optional)
- 3) Operating Speed
- 4) Cool Down Speed



For single speed operation, the **highlighted menu settings are required:**

| | |
|-------------------------------------|---|
| Auto Operation Settings Menu | Start/Stop Input (Floats , Transducer) |
| | Throttle Mode (Single Speed , Linear,) |
| | Operate Speed (Select Operating Speed) |

| | |
|---------------------------------------|--|
| Auto Start Configuration Menu | Auto Start Delay (Default = 10 seconds) |
| | Pre Heat Time (Default = 0 seconds) |
| | Crank Time (Default = 10 seconds) |
| | Crank Rest Time (Default = 10 seconds) |
| | Warm Up Speed (Default = 800 rpm) |
| | Warm Up Time (Default = 10 seconds) |
| | Prime Speed (Default = 800 rpm) |
| | Prime Time (Default = 0 seconds) |
| | Cool Down Speed (Default = 650 rpm) |
| | Cool Down Time (Default = 10 seconds) |
| | Crank Cycles (Default = 5) |
| | Fault Bypass Period (Default = 10 seconds) |
| | Crank Hold Delay (Default = 0) |
| | Recharge Monitor (Default = Off) |
| | Recharge Voltage Selection |
| | Recharge Delay Selection |
| Recharge Run Time Selection | |
| Next Recharge Time Interval Selection | |

If any auto start configuration settings are not required (such as warm up speed), set the time to 0:00 seconds for that parameter.

LINEAR THROTTLE

Note: For Linear throttle applications in Auto Start, the Throttle Type in Throttle Configuration should be set to TSC Vernier.

With linear throttle, the minimum and maximum engine speeds and the corresponding minimum and maximum percentages are selected. Engine speed adjusts according to the linear relationship as shown below.

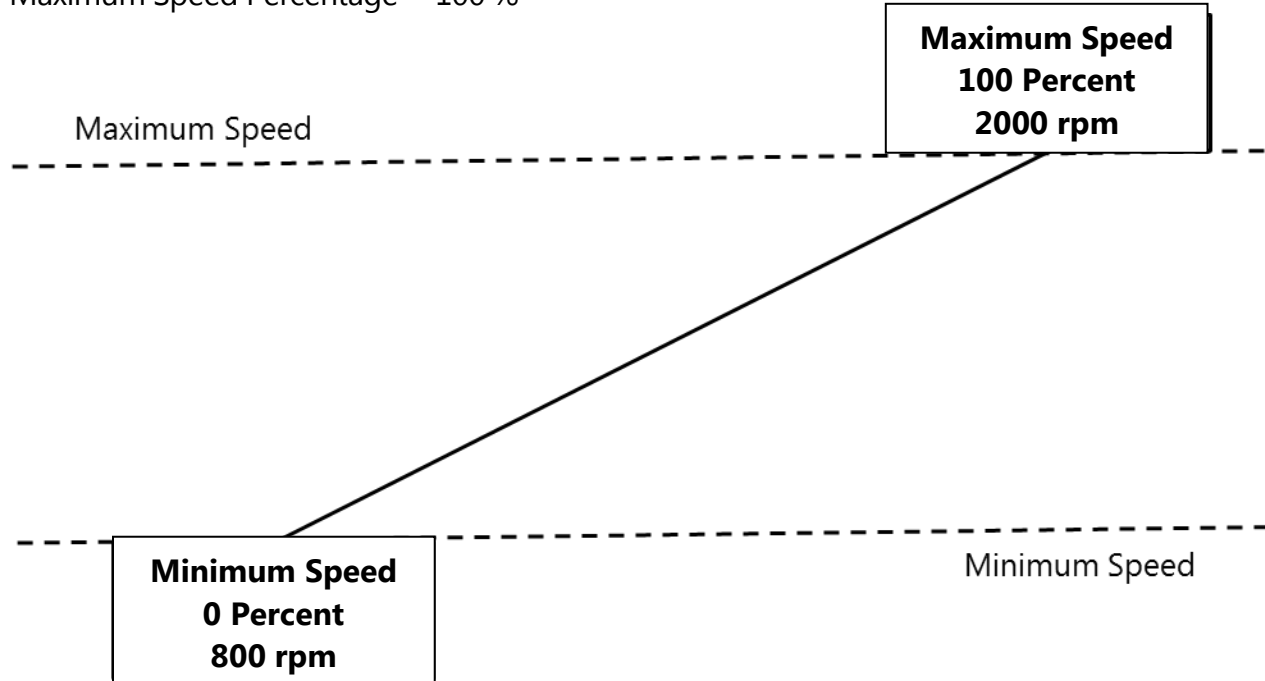
Example: Analog Throttle Input (0 to 100 percent range)

Minimum Speed = 1000 rpm

Maximum Speed = 2000 rpm

Minimum Speed Percentage = 0 %

Maximum Speed Percentage = 100 %



Linear throttle can be combined with any of the automatic engine start/stop modes. If any automatic speeds settings are not required (such as warm up), set the time delay to 0:00 seconds for that parameter.

For linear throttle operation, **the highlighted menu settings are required.**

| (1) | Parameter Configuration | Parameter | Selection | Default Settings |
|-----|-------------------------|-----------------------|-----------|------------------|
| | Transducer 1 | Type | | Percent |
| | | Interface | | 0-5V |
| | | Minimum Reading | | 0% |
| | | Maximum Reading | | 100% |
| | | Current Percent | | |
| | | Zero Trim Calibration | | |
| | | | | |
| | Analog Throttle | Scale | | 4-20mA |
| | | Zero Trim Calibration | | |
| | | | | |

| Auto Operation Settings Menu | |
|------------------------------|---|
| | Start/Stop Input (Floats, Transducer) |
| | Throttle Mode (Single Speed, Linear) |
| | Min Control Speed (Default = 800 rpm) |
| | Max Control Speed (Default = 2400 rpm) |
| | Min Speed @ (Default = 0 %) |
| | Max Speed @ (Default = 100 %) |

| Auto Start Configuration Menu | |
|-------------------------------|--|
| | Auto Start Delay (Default = 10 seconds) |
| | Pre Heat Time (Default = 0 seconds) |
| | Crank Time (Default = 10 seconds) |
| | Crank Rest Time (Default = 10 seconds) |
| | Warm Up Speed (Default = 800 rpm) |
| | Warm Up Time (Default = 10 seconds) |
| | Prime Speed (Default = 800 rpm) |
| | Prime Time (Default = 0 seconds) |
| | Cool Down Speed (Default = 650 rpm) |
| | Cool Down Time (Default = 10 seconds) |
| | Crank Cycles (Default = 5) |
| | Fault Bypass Period (Default = 10 seconds) |
| | Crank Hold Delay (Default = 0) |
| | Recharge Monitor (Default = Off) |
| | Recharge Voltage Selection |
| | Recharge Delay Selection |
| | Recharge Run Time Selection |
| | Next Recharge Time Interval Selection |

If any auto start configuration settings are not required (such as warm up speed), set the time to 0:00 seconds for that parameter.

PANEL OPERATION

MANUAL OPERATION

- 1) **Engine Start - Turn key to CRANK position**
- 2) **Engine Stop - Turn key to OFF position**
- 3) **Engine Throttle - Push up and down buttons**

Throttle operation based on manual throttle settings.

AUTO START/STOP OPERATION

- 1) **Engine Start - Turn key to AUTO position**

Engine start/stop based on auto start/stop settings. Panel display shows "Auto Start ARMED" message.

- 2) **Engine Throttle**

Throttle operation based on auto throttle settings.

SLEEP MODE

To minimize current draw, the panel goes into a sleep mode two minutes after being set in auto mode. In sleep mode, the display goes blank and the red lamp blinks once every ten seconds. The engine ECU is also turned off.

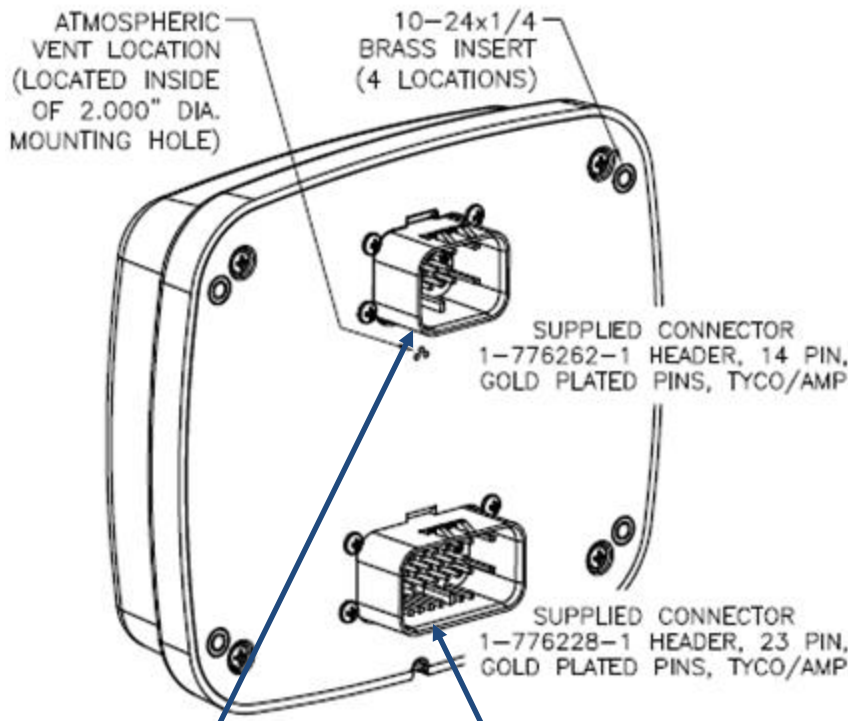
Upon receiving a signal from a float or transducer, the panel wakes up, the display turns back on and normal operation commences.

Pushing any of the four buttons wakes up the panel and turns the display on. It will return to sleep mode after a two minute period.



For service purposes, to keep engine ECU powered, access the menu system. The engine ECU remains on when the menu system is active.

MODULE CONNECTORS



Primary Connector
14 Pin

Secondary Connector
23 Pin

MATING CONNECTOR DETAIL (TOP)



- 776273-1 PLUG, TYCO/AMP (BLACK)
- 770854-1 SOCKET (TIN PLATED)
- 770854-3 SOCKET (GOLD PLATED)

MATING CONNECTOR DETAIL (BOTTOM)



- 770680-1 PLUG, TYCO/AMP (BLACK)
- 770854-1 SOCKET (TIN PLATED)
- 770854-3 SOCKET (GOLD PLATED)

PRIMARY CONNECTOR (14 Pin)

| Pin | Function | Pin | Function |
|-----|--------------------------|-----|--------------------|
| 1 | Fuel Solenoid/ECU Signal | 8 | J1939 Low |
| 2 | Pre Alarm Signal | 9 | Battery Positive |
| 3 | Alarm Signal | 10 | Key Auto Detect |
| 4 | Battery Positive | 11 | Battery Positive |
| 5 | Crank Signal | 12 | Battery Negative |
| 6 | Battery Positive | 13 | N/A |
| 7 | J1939 High | 14 | Remote Start Input |

CAUTION:

Maximum current draw for signal circuits is 5 amps

SECONDARY CONNECTOR (23 Pin)

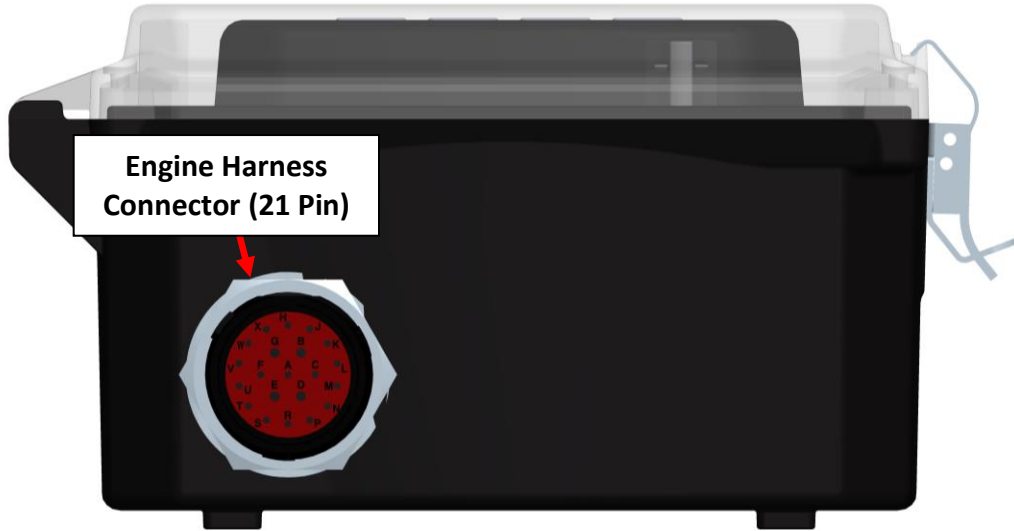
| Pin | Function | Pin | Function | Pin | Function |
|-----|----------------------------|-----|-----------------------|-----|---------------------|
| 1 | Output Relay #5 N/O | 9 | Relays # 5 & 6 Common | 16 | Output Relay #6 N/O |
| 2 | | 10 | | 17 | Digital Input #2 |
| 3 | Transducer #1 (Start/Stop) | 11 | | 18 | Digital Input #3 |
| 4 | | 12 | Analog Throttle Input | 19 | Digital Input #4 |
| 5 | | 13 | Digital Input #9 | 20 | Digital Input #5 |
| 6 | | 14 | Digital Input #8 | 21 | Digital Input #6 |
| 7 | | 15 | Relays # 7 & 8 Common | 22 | 5v Output |
| 8 | Output Relay #7 N/O | | | 23 | Output Relay #8 N/O |

CAUTION:

Maximum current draw relay output circuits is 5 amps

PANEL CONNECTORS

1. Engine Harness Connector – Deutsch 21 pin (HDP24-24-21PE)
2. Accessory Connector – Deutsch 31 pin (HDP-24-24-31PE)



Instance: C3-FR223-A5

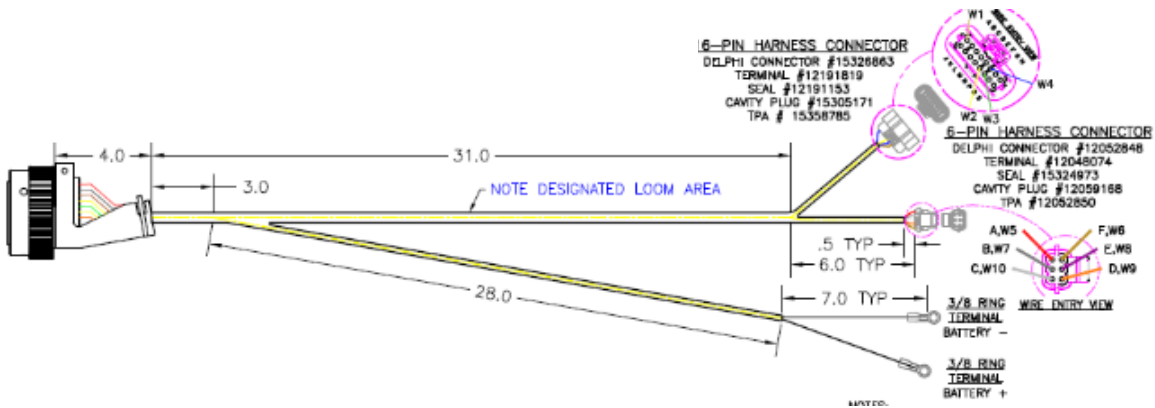
| 21 Pin Engine Harness Connector | |
|---------------------------------|-----------------------|
| Pin | Function |
| B | Battery Positive |
| E | Battery Negative |
| G | Key On Power |
| D | Crank Signal |
| V | J1939 High |
| U | J1939 Low |
| C | Analog Throttle Input |
| L | Sensor Supply B+ |
| R | Transducer 1 Input |
| M | Sensor Supply B- |
| S | 5v Supply |
| X | Auto Start |

CAUTION:

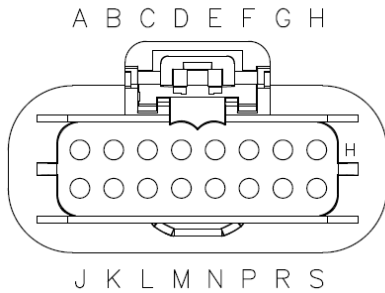
Maximum current draw for relay output circuits is 5 amps

TRANSITION HARNESS

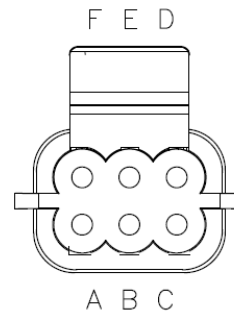
This control panel has a transition harness available for PSI Customer applications. The part number for this harness is 70-0628.



WIRE ENTRY VIEW



WIRE ENTRY VIEW



| 16 Pin Harness Connector | |
|--------------------------|--------------|
| Pin | Function |
| A | VSW |
| N | CAN High |
| P | CAN Low |
| F | Crank Signal |

| 6 Pin Harness Connector | |
|-------------------------|-----------------------------------|
| Pin | Function |
| A | Sensor Supply B+ |
| B | Sensor Supply B- |
| C | Analog Throttle Input |
| D | Transducer #1 (Start/Stop) Signal |
| E | 5VDC Supply |
| F | Auto Start Signal |

ENGINE ALARMS, CODES AND MESSAGES

ENGINE ECU ALARMS/DE-RATE/SHUT DOWNS

It is important to understand panel operation with respect to engine safety protections, alarms, and fault codes. The panel operates with J1939 engines. These engines have an ECU (engine control unit) which is essentially a computer that runs the engine. When engine parameters are out of normal operating ranges, the ECU takes specific actions which can include the following:

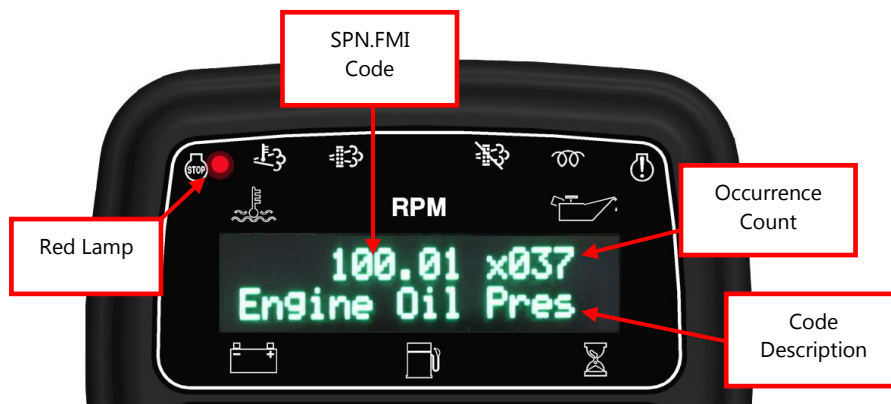
- 1) Broadcast a trouble code
- 2) Broadcast a red or yellow lamp
- 3) De-rate the engine
- 4) Shut down the engine
- 5) Turn on alarm horn

It is the engine ECU that de-rates or shuts down the engine when it is not operating within normal parameters. This includes more common shut downs like high engine temperature and low oil pressure but can encompass a large range of parameters depending on the ECU.

PANEL ALARM ANNUNCIATION AND CODE READER

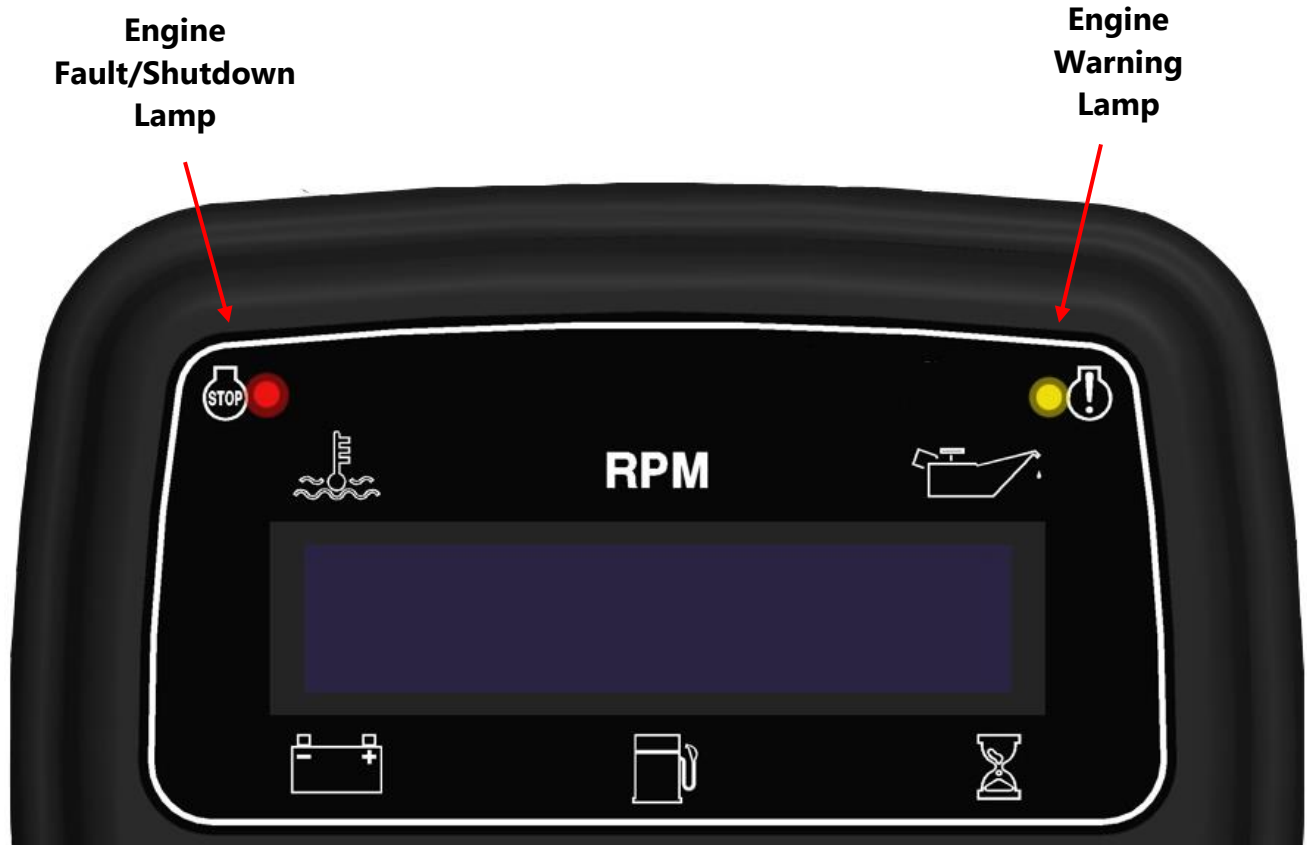
This panel is configured to operate with standard J1939 engines where engine de-rate and shutdowns are managed by the engine ECU. The panel communicates with the engine ECU and serves as a trouble code reader. When the engine ECU broadcasts a trouble code (called an SPN.FMI code) the panel does the following:

- 1) Illuminates the appropriate LED indicator lamp
 - a. Yellow Lamp = Alarm
 - b. Red Lamp = Engine Shut Down
- 2) Displays the trouble code (standard SPN.FMI code)
- 3) Displays a code description on the LCD screen
- 4) Displays the occurrence count of the code



INDICATION LAMPS

The panel has two lamp indicators



ACTIVE AND STORED ENGINE ECU CODES

The panel also provides the ability to check the engine ECU for all ACTIVE and STORED engine ECU codes. These codes can be viewed via the Active Codes and Stored Codes menus. In addition, the control panel has its own Alarm Event Log menu that shows the last 16 engine ECU alarms as well as any control panel specific alarms.

CONTROL PANEL SPECIFIC ALARMS AND SHUT DOWNS

The panel has its own engine safety alarms and shut downs that can be enabled. These alarms and shut downs are managed by the control panel independent from the engine ECU. The available options are listed below and can be accessed via the Engine Safety Configuration menu.

Each alarm must be enabled in the Engine Safety Configuration menu to activate.

| Heading | Default | Range | Units |
|-------------------------|---------|--------------------|---------|
| Sender Check Bypass | 0:10 | 0:05 – 1:00 | Min:Sec |
| Fuel Level Check | Off | Off / Always / Run | |
| Low Fuel Pre Alarm | 20 | 0 - 100 | % |
| Low Fuel Alarm | 1 | 0 - 100 | % |
| Fuel Alarm Delay | 0:05 | 0:01 – 1:40 | Sec |
| Oil Pressure Check | Run | Off / Always / Run | |
| Low Oil Press Pre Alarm | 6 | 0 - 100 | PSI |
| Low Oil Press Alarm | 5 | 0 - 100 | PSI |
| Oil Press Alarm Delay | 0:10 | 0:01 – 1:40 | Sec |
| Temperature Check | Run | Off / Always / Run | |
| Low Temp Pre Alarm | 0 | 0 - 300 | Deg F |
| Low Temp Alarm | 0 | 0 - 300 | Deg F |
| High Temp Pre Alarm | 244 | 150 - 300 | Deg F |
| High Temp Alarm | 245 | 150 - 300 | Deg F |
| Temp Alarm Delay | 0:10 | 0:01 – 1:40 | Min:Sec |
| Battery Volts Check | Off | Off / Always / Run | |
| Low Battery Pre Alarm | 12.0 | 0.0 – 40.0 | Volts |
| Hi Battery Pre Alarm | 15.0 | 0.0 – 40.0 | Volts |
| Over Speed Check | Off | Off / Always / Run | |
| Over Speed Alarm | 3000 | 650 - 5000 | RPM |
| Over Speed Alarm Delay | 0:05 | 0:01 – 1:40 | Min:Sec |

- 1) Off / Always / Run – Describes when the parameter will be monitored for alarm conditions. **Run** refers to when the engine is running. **Off** disables the alarm conditions. **Always** enables the alarm constantly regardless of engine state.
- 2) Alarm Delay – The time period, after Sender Check Bypass, that the parameter must be on the alarm condition before the alarm becomes latched.

CONTROL PANEL ANALOG AND DIGITAL INPUTS

The panel provides the analog and digital inputs defined below located in the ***Input Configuration menu***. *The panel is shipped from the factory with the **highlighted** inputs enabled in the panel. Inputs not highlighted need to be enabled/configured in the menu system to be used.*

| Input | Heading | Default | Options | Connector | Pin |
|----------------------------|-----------------|------------------------|--------------------|-------------------------|----------|
| Analog 1 | Function | Transducer 1 | | 21 Pin Connector | R |
| Analog 4 | Function | Analog Throttle | | 21-Pin Connector | C |
| Digital 1 | Function | Auto Start | | 21-Pin Connector | X |
| Digital 2 | Normally | Open | Open / Closed | | |
| | Function | None | | | |
| | Message | None | | | |
| | Check | Off | Off / Always / Run | | |
| Digital 3 | Normally | Open | Open / Closed | | |
| | Function | None | | | |
| | Message | None | | | |
| | Check | Off | Off / Always / Run | | |
| Digital 4 | Normally | Open | Open / Closed | | |
| | Function | None | | | |
| | Message | None | | | |
| | Check | Off | Off / Always / Run | | |
| Digital 5 | Normally | Open | Open / Closed | | |
| | Function | None | | | |
| | Message | None | | | |
| | Check | Off | Off / Always / Run | | |
| Digital 6 | Normally | Open | Open / Closed | | |
| | Function | None | | | |
| | Message | None | | | |
| | Check | Off | Off / Always / Run | | |
| Digitals 8 and 9 available | | | | | |

DIGITAL FUNCTIONS

The digital inputs can be configured for different uses depending on the application. These include the following:

- 1) Alarm – Engine shutdown when active with display message as assigned. A red lamp will also be illuminated.
- 2) Pre Alarm – Warning message will be displayed along with a yellow lamp when active.
- 3) Low Float – For auto start applications where a dual float system is desired. Note, Digital 1 Action must be configured for Auto Start.
- 4) Aux Throttle Up – Mimics the front panel key press for speed control.
- 5) Aux Throttle Down - Mimics the front panel key press for speed control.
- 6) Auto Start Inhibit – When this input is taken to ground, the Auto-Start sequence will not initiate.

DIGITAL FUNCTION MONITORING

Off / Always / Run – Describes when the parameter will be monitored for alarm conditions. Run refers to when the engine is running. Off disables the alarm conditions. Always enables the alarm constantly regardless of engine state.

DIGITAL FUNCTION DELAYS

Alarm Delay – The time period, after Sender Check Bypass, that the parameter must be on the alarm condition before the alarm becomes latched.

CONTROL PANEL RELAY OUTPUTS

The panel provides relay outputs defined below located in the **Output Configuration menu**. The relays are rated at 5 amps.

*The panel is shipped from the factory with the **highlighted** outputs enabled and pre-wired in the panel.*

| Relay | Heading | Default | Connector | Pin |
|----------------|----------------------|-----------------|------------------|----------|
| Relay 1 | Function | Pre Alarm | | |
| | Polarity | Positive | | |
| | Initial State | Off | | |
| Relay 2 | Function | Fuel/Run | 21 Pin Connector | G |
| | Polarity | Positive | | |
| | Initial State | On | | |
| Relay 3 | Function | Alarm | | |
| | Polarity | Positive | | |
| | Initial State | Off | | |
| Relay 4 | Function | Crank | 21 Pin Connector | D |
| | Polarity | Positive | | |
| | Initial State | Off | | |
| Relay 5 | Function | | | |
| | Polarity | Positive | | |
| | Initial State | Off | | |
| Relay 6 | Function | | | |
| | Polarity | Positive | | |
| | Initial State | On | | |
| Relay 7 | Function | | | |
| | Polarity | Positive | | |
| | Initial State | Off | | |
| Relay 8 | Function | | | |
| | Polarity | | | |
| | Initial State | | | |

RELAY FUNCTIONS

Available relays can be assigned for different uses.

- a. None - Assign to "none" when not used.
- b. Start Warning - Relay will be active during auto start delay period. Typically used to drive the low side of an alarm horn or light.
- c. Crank - Relay will be active during auto crank period. Used to drive a starter relay.
- d. Pre heat - Relay will be active during programmed preheat period. Used to drive a preheat relay.
- e. Fuel / Run - Relay will be active during an engine start request and while the engine is running. Used to drive the engine's ECU circuit. Also active when requesting active and stored J1939 codes.
- f. Switch Trip - Relay will be active if digital input is active.
- g. Engine Run - Relay will be active when engine RPM is greater than 600. Typically used to drive an auxiliary circuit such as louvers or send a signal to a monitoring station.
- h. Alarm - Relay will be active when there is an alarm condition. Typically used to drive an alarm horn or lamp. Also can be used to send a signal to a monitoring station.
- i. Pre Alarm - Relay will be active when there is a pre alarm condition. Typically used to drive an alarm horn or lamp. Also can be used to send a signal to a monitoring station.
- j. Pre Alarm & Alarm - Energizes an external audible alarm when a pre alarm or alarm condition is present. Pressing the ENTER button will silence.
- k. Alarm Horn - Energizes an external audible alarm when an alarm condition is present. Pressing the ENTER button will silence.
- l. Low Oil Press Alarm - Relay closes if a low oil pressure shutdown is detected.
- m. High Coolant Temp Alarm - Relay closes if a high engine temperature shutdown is detected.
- n. Over Speed Alarm - Relay closes if an over speed shutdown is detected.
- o. Over Crank Alarm - Relay closes if an over crank alarm is detected.
- p. Low Fuel Level Alarm - Relay closes if a low fuel level shutdown is detected.
- q. Input 2-9 - Closes if the associated input is active.
- r. Clutch 1 - Closes when Clutch 1 conditions are met.
- s. Clutch 2 - Closes when Clutch 2 conditions are met.
- t. Throttle B1 - Reserved for OEM applications.

- u. Throttle B0 - Reserved for OEM applications.
- v. Custom 1 - Reserved for OEM applications.

RELAY POLARITY

- a. Positive - Relay acts as a normally open contact.
- b. Invert - Relay acts as a normally closed contact.

RELAY INITIAL STATE

- a. On - Relay is activated upon power up.
- b. Off - Relay is not activated upon power up.

SERVICE/MAINTENANCE MESSAGES

Maintenance intervals and messages can be enabled.

| | |
|---------------------------------------|---|
| Maintenance Configuration Menu | Service Interval Message On/Off |
| | Reset Interval Yes/No |
| | Service Warning Hour Selection |
| | Service Required Message Hour Selection |
| | Next Service Warning Interval Selection |
| | Next Required Message Hour Interval Selection |
| | 1st Warning Service Hour Selection |
| | 1st Service Required Message Hour Selection |

Maintenance intervals can be turned on allowing predetermined time intervals to be monitored for approaching and past service conditions. Because new engines typically require a shorter interval to the first required service, the controller has two sets of programmable intervals. The first service warning is set for 75 hours and the first service required alarm is set for 100 hours.

Once the initial service time has been reset using the control panel maintenance menu, the service intervals will automatically be incremented to the Next Service Warning Interval and the Next Service Required Interval as programmed into the controller.

After resetting the interval, the controller will automatically add the engine hours and the interval time to show the operator exactly when service will be required next. The control panel will display a yellow LED lamp and a message as the service intervals expire and maintenance is required. *Expired service intervals **will not stop** the engine from running.*

PANEL TO ENGINE ECU COMMUNICATIONS

Communication between the panel and the engine ECU occurs over the two wire CAN bus (CAN High wire and CAN Low wire). It is necessary that the panel and engine ECU settings be the same for the following parameters:

1) Source Address

The source address is where the engine sends display and alarm data.

2) TSC1 Address

The TSC1 address is the address from which the engine ECU receives throttle commands from the panel. If the panel and engine ECU do not have the same TSC1 address, the engine will not throttle up or down.

3) Engine Type

This panel is pre-set to PSI (E-Controls).

The communication settings are available in the ***CAN Configuration menu*** shown below.

| CAN Configuration Menu | |
|-------------------------------|-------------------------------|
| | Source Address (Default = 44) |
| | TSC1 Address (Default = 39) |
| | Engine Address (Default = 0) |
| | Engine Type (Default = PSI) |
| | Voltage Transmit |
| | Hours Transmit |
| | Faults Transmit |

BATTERY RECHARGE MONITOR

A battery recharge monitoring system is available to start and run the engine to keep the battery system charged. The battery recharge settings are available in the **Auto Start Configuration menu**. The highlighted selections are required.

| | |
|--|--|
| Auto Start Configuration Menu | Auto Start Delay (Default = 10 seconds) |
| | Pre Heat Time (Default = 0 seconds) |
| | Crank Time (Default = 10 seconds) |
| | Crank Rest Time (Default = 10 seconds) |
| | Warm Up Speed (Default = 800 rpm) |
| | Warm Up Time (Default = 10 seconds) |
| | Prime Speed (Default = 800 rpm) |
| | Prime Time (Default = 0 seconds) |
| | Cool Down Speed (Default = 650 rpm) |
| | Cool Down Time (Default = 10 seconds) |
| | Crank Cycles (Default = 5) |
| | Fault Bypass Period (Default = 10 seconds) |
| | Crank Hold Delay (Default = 0) |
| | Recharge Monitor (Default = Off) |
| | Recharge Voltage Selection |
| | Recharge Delay Selection |
| | Recharge Run Time Selection |
| Next Recharge Time Interval Selection | |

MAIN MENUS

| | | |
|---|---|------|
| Active Engine Fault Codes | View/Scroll Active Fault Codes | |
| Stored Engine Fault Codes | View/Scroll Stored Fault Codes | |
| Operation Event Log | View Last 32 Events (Start, Stop, Alarms) | |
| Alarms Event Log | View Last 32 ECU and Controller Alarms) | |
| Engine Parameters Menu | View ECU Engine Information | |
| | (% Load, Torque, Oil Temp, etc.) | |
| Engine Identification Menu | Engine Model # View | |
| | Engine Serial # View | |
| Module Information Menu | Control Unit Part# View | |
| | Control Unit Software Version View | |
| Controller Setup Menus (PASSWORD PROTECTED) | Parameter Configuration | (1) |
| | Input Configuration | (2) |
| | Output Configuration | (3) |
| | Throttle Configuration | (4) |
| | Engine Safety Configuration | (5) |
| | Module Configuration | (6) |
| | CAN Configuration | (7) |
| | Auto Start Configuration | (8) |
| | Auto Operation Configuration | (9) |
| | Maintenance Configuration | (10) |

Viewing Menus

Configuration Menus

CONFIGURATION MENUS

| (1) | Parameter Configuration | Parameter | Selection | Default Settings |
|-----|-------------------------|-----------------|------------------------------|------------------|
| | | Fuel Level | Not Available | |
| | | Voltage | Voltage Source | Battery -J1939 |
| | | | Battery Trim (Internal Only) | |
| | | Hour Meter | Hour Meter Source | Engine ECU |
| | | | Set Hours (Internal Only) | |
| | | Transducer 1 | Type | Percent |
| | | | Interface | 0-5V |
| | | | Minimum Reading | 0% |
| | | | Maximum Reading | 100% |
| | | | Current Percent | |
| | | | Zero Trim Calibration | |
| | | Analog Throttle | Scale | 4-20mA |
| | | | Zero Trim Calibration | |

| (2) | Input Configuration | |
|-----|---------------------|--|
| | | Digital Input 1 - Pre Set to Auto Start |
| | | Digital Input 2 Setup (NO/NC, Action, Message, When Active, Delay) |
| | | Digital Input 3 Setup (NO/NC, Action, Message, When Active, Delay) |
| | | Digital Input 4 Setup (NO/NC, Action, Message, When Active, Delay) |
| | | Digital Input 5 Setup (NO/NC, Action, Message, When Active, Delay) |
| | | Digital Input 6 Setup (NO/NC, Action, Message, When Active, Delay) |
| | | Digital Input 7 Setup (NO/NC, Action, Message, When Active, Delay) |
| | | Digital Input 8 Setup (NO/NC, Action, Message, When Active, Delay) |
| | | Digital Input 9 Setup (NO/NC, Action, Message, When Active, Delay) |

| (3) | Output Configuration | |
|-----|----------------------|--|
| | | Relay Output 1 - Pre Set to Pre Alarm |
| | | Relay Output 2 - Pre Set to Fuel/Run |
| | | Relay Output 3 - Pre Set to Alarm |
| | | Relay Output 4 Setup - Pre Set to Crank Signal |
| | | Relay Output 5 Setup (Function, Polarity, Initial State) |
| | | Relay Output 6 Setup (Function, Polarity, Initial State) |
| | | Relay Output 6 Setup (Function, Polarity, Initial State) |
| | | Relay Output 7 Setup (Function, Polarity, Initial State) |
| | | Relay Output 8 Setup (Function, Polarity, Initial State) |

| | |
|-----------------------------------|---|
| (4) Throttle Configuration | Throttle Type - Throttle Type Selection (Default = TSC Vernier) |
| | TSC Mode Selection (Default = Primary) |
| | TSC Min Speed Selection (Default = 800 rpm) |
| | TSC Max Speed Selection (Default = 2400 rpm) |
| | TSC Bump Speed Selection (Default = 20 rpm) |
| | TSC Ramp Rate Selection (Default = 100rpm/sec) |
| | Throttle Curve Selection (Default = Linear) |
| | Multistate Speed 1 Selection |
| | Multistate Speed 2 Selection |
| | Multistate Speed 3 Selection |
| | Multistate Speed 4 Selection |

| | |
|--|---|
| (5) Engine Safety Configuration | Sender Check Bypass Time Period Selection |
| | Fuel Level Check On/Off Selection |
| | Low Fuel Level Pre Alarm % Selection |
| | Low Fuel Level Alarm % Selection |
| | Fuel Level Alarm Delay Time Selection |
| | Oil Pressure Check On/Off Selection |
| | Low Oil Pressure Pre Alarm % Selection |
| | Low Oil Pressure Alarm % Selection |
| | Oil Pressure Alarm Time Delay Selection |
| | Engine Temperature Check On/Off |
| | Engine Temperature Pre Alarm Selection |
| | Engine Temperature Alarm Selection |
| | Engine Temperature Alarm Time Delay Selection |
| | Battery Volt Check On/Off |
| | Low Battery Volt Pre Alarm Selection |
| | High Battery Volt Pre Alarm Selection |
| | Battery Volt Trim Setting |
| | Over Speed Alarm On/Off |
| | Over Speed Alarm RPM Setting |
| | Over Speed Alarm Time Delay Selection |

| | |
|---------------------------------|---------------------------------|
| (6) Module Configuration | English/Metric Selection |
| | Hour meter Source |
| | Hour meter Setting (if not ECU) |
| | Battery Volt Source |
| | Low Power Mode |
| | Suction/Discharge Display |
| | Pre Alarms Displayed |
| | Clear Operation Log Yes/No |
| | Clear Alarm Log Yes/No |

| | |
|------------------------------|-------------------------------|
| (7) CAN Configuration | Source Address (Default = 44) |
| | TSC1 Address (Default = 39) |
| | Engine Address (Default = 0) |
| | Engine Type (Default = PSI) |
| | Fuel Transmit (Not Available) |
| | Voltage Transmit |
| | Hours Transmit |
| | Fault Transmit |

| | |
|---------------------------------------|--|
| (8) Auto Start Configuration | Auto Start Delay (Default = 10 seconds) |
| | Pre Heat Time (Default = 0 seconds) |
| | Crank Time (Default = 10 seconds) |
| | Crank Rest Time (Default = 10 seconds) |
| | Warm Up Speed (Default = 800 rpm) |
| | Warm Up Time (Default = 10 seconds) |
| | Prime Speed (Default = 800 rpm) |
| | Prime Time (Default = 0 seconds) |
| | Cool Down Speed (Default = 800 rpm) |
| | Cool Down Time (Default = 10 seconds) |
| | Crank Cycles (Default = 5) |
| | Fault Bypass Period (Default = 10 seconds) |
| | Crank Hold Delay (Default = 0) |
| | Crank Release Speed (Default = 400 rpm) |
| | Recharge Monitor (Default = Off) |
| | Recharge Voltage Selection |
| | Recharge Delay Selection |
| Recharge Run Time Selection | |
| Next Recharge Time Interval Selection | |

| | |
|------------------------------------|---|
| (9) Auto Operation Settings | Start/Stop Input (Floats, Transducer) |
| | Menu options changed based on start/stop input selected |

| | |
|---------------------------------------|---|
| (10) Maintenance Configuration | Service Interval Message On/Off |
| | Reset Interval Yes/No |
| | Service Warning Hour Selection |
| | Service Required Message Hour Selection |
| | Next Service Warning Interval Selection |
| | Next Required Message Hour Interval Selection |
| | 1st Warning Service Hour Selection |
| | 1st Service Required Message Hour Selection |