The **Class1** Engine Status Center (ESC) is a convenient self contained Engine information display for the Pump Panel Operator. Visual and Audible Alarms are available for critical information. The ESC utilizes the SAE J-1587 data link for engine information.

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1. Engine RPM Display
2. System Voltage Display and Alarm (HI and LO alarms)
3. Engine Oil Pressure Display and Alarm
4. Engine Temperature Display and Alarm (Oil or Coolant)
5. Alarm set-points can be ‘preset’ for custom installations
6. Alarm Silence and Disable Feature
7. Alert! Messages with audible signal
8. Engine Status (Check Engine and Stop Engine Messages)
9. English or Metric Display
10. Hourmeters for Engine, PTO and ‘User’ time
11. Service Interval Timer for PTO with Reminder Message
12. ‘Incident’ Timer
13. Custom Message Display

**Class1**‘s Engine Status Center (ESC - p/n 105536) provides the pump operator with engine and system operating information in a single unit.
The **Engine Status Center Display** (ESC) continuously shows Engine RPM, Oil Pressure, Temperature, and System Voltage on four seven segment LED displays. The mode of operation (English or Metric) is indicated by an LED illuminated next to the current mode.

If a low oil pressure situation occurs, the oil pressure display will alternate between the current oil pressure and **LO**.
If a high temperature condition develops, the engine temperature display will toggle between the temperature value and **HI**.
A low voltage condition results in **CHK BATT** being displayed and the voltmeter alternates between the actual voltage and **LO**.
An overvoltage situation will display actual voltage alternating with **HI** on the voltmeter and **CHK ALT** will be shown in the message center.

The **MESSAGE CENTER** is an eight character alphanumeric display. In normal operation the message center will display a logo.
If a Check Engine or Stop Engine malfunction occurs, Detroit Diesel Engines transmit both of these messages on the data bus, the display will read **CHK ENG** or **STOP ENG**. Other Electronic Engines may not transmit these messages. To display Stop or Check engine messages for these engines, connections must be made from the engine ECM or cab indicators to the ESC.

The message center also displays menu information when the menu switch is depressed. The menu may only be accessed when engine speed is below 900 RPM.

The **MENU** switch scrolls through the menu and the **SELECT** switch either selects the item or toggles between choices. The **SILENCE** switch saves current data and exits from the menu.
ESC harness connection to the apparatus is achieved by the use of two connectors.

**Deutsch DT06-4S 4 socket connector**

<table>
<thead>
<tr>
<th>Cavity</th>
<th>Description</th>
<th>ESC</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td>Ignition Power</td>
<td>24V In</td>
</tr>
<tr>
<td>A-2</td>
<td>System Ground</td>
<td>Ground in</td>
</tr>
<tr>
<td>A-3</td>
<td>Data Link +</td>
<td>J1587 in</td>
</tr>
<tr>
<td>A-4</td>
<td>Data Link -</td>
<td>J1587 in</td>
</tr>
</tbody>
</table>

**Deutsch DT06-12S 12 socket connector**

<table>
<thead>
<tr>
<th>Cavity</th>
<th>Description</th>
<th>ESC</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1</td>
<td>Plug</td>
<td>Ground input from engine ECM</td>
</tr>
<tr>
<td>B-2</td>
<td>Plug</td>
<td>Ground input from OEM can be used for STOP ENG</td>
</tr>
<tr>
<td>B-3</td>
<td>Plug</td>
<td>Ground output to an OEM alarm</td>
</tr>
<tr>
<td>B-4</td>
<td>Check Engine</td>
<td>Ground input from engine ECM</td>
</tr>
<tr>
<td>B-5</td>
<td>User Input</td>
<td>Ground input from OEM</td>
</tr>
<tr>
<td>B-6</td>
<td>Plug</td>
<td>Positive input for PTO hours</td>
</tr>
<tr>
<td>B-7</td>
<td>Plug</td>
<td>Positive input for USER hours</td>
</tr>
<tr>
<td>B-8</td>
<td>Plug</td>
<td>Ground input for low fuel alert</td>
</tr>
<tr>
<td>B-9</td>
<td>Alarm</td>
<td>Ground output to an OEM alarm</td>
</tr>
<tr>
<td>B-10</td>
<td>PTO engaged</td>
<td>Positive input for PTO hours</td>
</tr>
<tr>
<td>B-11</td>
<td>User Hours</td>
<td>Positive input for USER hours</td>
</tr>
<tr>
<td>B-12</td>
<td>Low Fuel</td>
<td>Ground input for low fuel alert</td>
</tr>
</tbody>
</table>

B-4 is a ground input dedicated to the Check Engine Warning of the ESC. To receive this message on non-DDEC engines, you must provide this input.

B-5 is a ground input that will display a generic warning message AUX IN. This can be any warning signal that you wish the operator to receive. For example on a non-DDEC engine, provide a ground input from the STOP Engine output of the engine ECM and change the message to read STOP ENG if you want the Pump Operator to receive the STOP ENGINE Message.

B-9 is a ground output to an OEM alarm.

B-10 is a positive (24 VDC) input that allows the ESC to accumulate PTO hours.

B-11 is a positive (24 VDC) input that will tally hours as long as the ESC and this input are active. The display message can be customized by the OEM to indicate its usage.

B-12 is a ground input from a tank level switch to alert the operator of a low fuel condition.
The ESC Menu can be entered at any time that the engine is operating at 900 RPM or less.

Enter the menu by pressing the MENU switch.

Scroll through the menu by using the MENU switch.

Select items from the menu by using the SELECT switch.

Save information and exit from the menu using the SILENCE switch.

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**Menu Items**

<table>
<thead>
<tr>
<th>MENU</th>
<th>TEST LTS</th>
<th>Test Display. Illuminate all display segments, LEDs and sounds alarm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELECT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MENU</th>
<th>UNITS: (E or M)</th>
<th>Select units for display. Toggles English and Metric units.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELECT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MENU</th>
<th>ALERT?: (Y or N)</th>
<th>Enables or Disables Toggles the Alert tone on or off. Enables the Alert Tone to direct the attention of the operator to certain messages.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELECT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| MENU   | HOURS                     | View operating hours.                                                |
|--------|---------------------------|                                                                     |
| SELECT | PTO HOUR                  | Display PTO hours.                                                   |
| SELECT | USER HR                   | Display USER hours.                                                  |
| SELECT | ENG HOUR                  | Display ENGINE hours.                                                |
| SELECT | INCIDENT                  | T=00:00 (hrs/mins) Timer starts at power up, resets at power down.   |

| MENU   |                           | return to TEST LTS.                                                 |
| SILENCE|                           | at any point in the menu returns you to normal operation.            |
**MESSAGES**

**Alert Messages** are preceded by a short tone burst to alert the operator. The cause for the alert is then displayed on the message center, alternating with other information.

Alert Messages:
- PTO ENGD: PTO engagement
- CHK ENG: Check Engine
- LDMGR ON: Load Management
- TANK LOW: Tank Level
- LM-LVL:x (1-8): Shed level

**Alarm Messages** are accompanied by a pulsed alarm that continues until silenced or the cause eliminated. The alarm message is displayed in the message center and LO or HI is displayed on the appropriate display for temperature, oil and voltage alarms.

Alarm Messages:
- AUX IN **: User Input
- LOW FUEL: less than 1/4 tank
- STOP ENG: Stop Engine
- CHK BATT *: System Voltage low
- CHK ALT *: System Voltage high
- LOW OIL *: Oil Pressure low
- HI TEMP *: Temperature high

Oil and Temp. alarms are active only with engine running.

Normal Messages appear without any audible warning.

Normal Messages:
- AUX HRS **: User hours
- CLASS 1 **: Logo
- SRVC PTO: Service reminder for PTO

* Alarm Points are set by the OEM.

**OEM configurable messages**

**Defaults Settings:**

- Service time Interval: 100 hours
- Aux. Input Display: AUX IN
- Aux. Hours Display: AUX HR
- Logo: CLASS1
- Low Voltage Alarm: YES
- Temperature source: DEG:OIL
- Low Oil Pressure: 10 PSI (69 kPa)
- High Temperature: 230 °F (110 °C)
- Low Voltage Alarm: 23.8 VDC
- Overvoltage: 30.0 VDC
SYSTEM OPERATION

ESC Power
A-1 circuit
A-2 circuit
These are the power and ground inputs for ESC operation and they also provide system voltage information to the ESC for display.

ESC Data
A-3 circuit
A-4 circuit
Engine information is received electronically on the J-1587 data bus.

Check Engine Warning
B-4 circuit
This input (ground) must be active for a check engine warning on all engines except Detroit Diesel.

Auxiliary Input
B-5 circuit
This input (ground) is used for an auxiliary device active or warning message (configurable by the OEM).

Alarm Output
B-9 circuit
This output (ground) should be active when TEST LTS is selected from the menu. The alarm can be deactivated during operation by the user.

PTO HRS
B-10 circuit
This input must be active (+ 24 VDC) when the PTO is engaged to log hours and display the PTO ENGD message.

Auxiliary Hours
B-11 circuit
This input (+ 24 VDC) can be used for any device that you want to monitor. The message is configurable by the OEM.

Low Fuel
B-12 circuit
This input (ground) will display a LOW FUEL alert message when active.
Notes:
The engine information is “read” from the engine ECM. If some information is displayed then the ESC is functioning properly. Missing information is the result of an engine broadcast not being sent or a message header not in the proper format. If temperature is missing check that the source (oil or water) is configured properly.

The voltage displayed is taken from the inputs at A1 and A2. It may vary from battery voltage dependent on the voltage drops in the wiring. The alarm points can be changed by the OEM to suit the end user.

The LOW FUEL input would normally be tied to a low fuel switch in the tank. This can be part of a sending unit or a separate switch.

The USER INPUT can be used for any purpose. It can be tied to a temperature switch on the transmission and labelled HOT TRNS or something to that effect.

The AUX HRS input can be tied to anything. An auxiliary generator or hydraulic pump for instance. The label can be changed and then hours on that equipment can be tracked.