



Katolight Electronic Governor JDEC

The Katolight electronic control system consists of electronically controlled unit injectors, engine sensors, engine control unit (ECU) and engine wiring harnesses. The ECU is the box that contains the computer and most other electronic components needed to operate the system. The ECU's primary job is scheduling an accurately timed pulse to each injector so that a controlled fuel quantity is injected into the cylinder at the correct crank angle.

JDEC Features

- The Katolight JDEC includes a special push button adjustable 2-state throttle feature that allows variable speed operation without a mechanical or potentiometer throttle.
- Up to two potentiometer throttles can be added if desired.
- The adjustable 2-state throttle feature can be used to easily preset maximum and minimum allowable operating speed when using a potentiometer throttle.
- The auto-cal feature eliminates the need for manual adjustment of analog throttles.
- Built in protection is provided to prevent abuse of the power-bulge feature.
- Automatic engine protection shutdown can be specified for low oil pressure, high coolant temperature, and any desired user selectable input (loss of prime, machine hydraulic temperature, etc.) eliminating the need for a separate magnetic shutdown switch.
- A new RE68155 2-inch digital diagnostic gauge displays diagnostic codes and warnings, engine hours, rpm, oil pressure, coolant temperature, system voltage, and many other engine parameters. It also includes "Warning" and "Stop Engine" lights.
- Additional gauge displays can be driven from the RE68155 diagnostic gauge to provide analog displays of rpm, oil pressure, coolant temperature, system voltage, % load, etc.
- Standard user-selectable 12V backlighting is provided (optional adapter required for 24-Volt units).

Governor Operations

The all speed governor can be set for either normal droop or isochronous operation. Normal droop, the default, gives a drop in engine speed with an increase in load or an increase in engine speed with a decrease in load. The normal % droop for your engine will be listed in the Katolight owner/operator manual and on the engine performance curve. When isochronous governing is selected the droop is set to 0%, and there is no change in engine speed with changing loads until the engines torque limit is reached.

Self Diagnostics

The ECU will detect failures within the control system including sensors, actuators and the ECU itself. The ECU monitors the engine fuel, coolant, and oil pressure sensors for out-of-range values or erratic operation.

Engine Diagnostics

The ECU can detect abnormal engine operating conditions or faults in several engine systems. Faults are stored in the ECU for later use by service personnel. Drivers are

provided for an amber “warning” light and a red “shutdown” light. Amber and Red lights are also incorporated into the Diagnostic Gauge.

Low Oil Pressure Protection

There are two low oil protection features, Low Oil Pressure WARNING and Low Oil Pressure SHUTDOWN. The set points for Low Oil Pressure WARNING and SHUTDOWN are variable based on engine speed. At the Low Oil Pressure WARNING set point, the ECU turns on the warning lamp and starts a gradual power derate. If the oil pressure goes above the Low Oil Pressure WARNING set point during that time, power increases gradually until the power is back to full power. The warning lamp will stay on until the power returns to normal even if the fault condition has gone away and the recovery is in process. At Low Oil Pressure SHUTDOWN set point the ECU turns on a shutdown lamp and starts a more rapid power derate. If the oil pressure does not go above the SHUTDOWN set point within 30 seconds, the engine will shutdown. If oil pressure goes above Low Oil Pressure SHUTDOWN set point within 30 seconds, power derate reverts to the Low Oil Pressure WARNING curve. Shutdown will only occur on systems with the shutdown option enabled.

Coolant Temperature Protection

There are two Coolant Temperature protection features, High Coolant Temperature WARNING, and High Coolant Temperature SHUTDOWN. If coolant temperature exceeds the maximum allowable level the ECU turns on the warning lamp and starts a gradual power derate. If the coolant temperature goes below the High Coolant Temperature WARNING set point, power increases gradually until the power is back to full power. The warning lamp will stay on until the power returns to normal even if the fault condition has gone away and the recovery is in process. At High Coolant Temperature SHUTDOWN set point the ECU turns on the shutdown lamp and starts an additional power derate. If the coolant temperature does not go below the SHUTDOWN set point within 30 seconds, the engine will shutdown. If coolant temperature goes below High Coolant Temperature SHUTDOWN set point within 30 seconds, power derate reverts to High Coolant Temperature WARNING curve.

Engine Protection

The ECU can detect several types of engine problems and may take actions to minimize engine damage that may result if these problems are not corrected. There are two levels of engine problems, “Warning” and “Shutdown”. “Warning” faults are engine problems that may lead to engine failures if not corrected. “Warning” faults include higher than normal fuel temperature, lower than normal oil pressure, higher than normal coolant temperatures, higher than normal charge air temperatures, or power derates. “Shutdown” faults are engine problems that indicate imminent engine failure. “Shutdown” problems included extremely low oil pressure, extremely high coolant temperatures, and loss of coolant. The “Warning” lamp will be on when a “Warning” fault is detected by the ECU and the “Shutdown engine” lamp will be on when a “Shutdown” fault is detected.

No Protection

Engine ECU’s with “No Protection” do not derate the engine when coolant temperature, oil pressure, or charge-air temperature “Warning” faults are detected and do not shutdown

the engine when there is a "Shutdown" fault. The "Warning" lamp lights when a "Warning" fault is detected by the ECU and the "Shutdown engine" lamp lights when a "Shutdown" fault is detected. The engine operator is responsible for reducing engine speed and power when a "Warning" fault exists and for shutting down the engine when a "Shutdown" fault exists. If engine coolant temperature and oil pressure sensors are not installed on engines with "No Protection" ECU's, no fault will be detected and the fault light will not light. "No Protection" ECU's can not warn of a broken or disconnected wire in the coolant temp and oil pressure sensor circuit. The other ECU's can detect this failure.

Derate Protection without Shutdown

The engine derate protection feature is only in ECU's with engine derate protection programmed into the ECU. All engine protection sensors including coolant temperature and oil pressure must be installed if engine protection is specified. Otherwise, a fault will be detected, and the fault lamp will light. The engine derate schedules will be active but the engine will not shutdown if a "Shutdown" fault is detected. The "Warning" lamp lights when a "Warning" fault is detected by the ECU and the "Shutdown engine" lamp lights when a "Shutdown" fault is detected. The engine operator is responsible for shutting down an engine with a "Shutdown" fault.

Shutdown without Derate Protection

The engine shutdown feature is only in ECU's with engine shutdown programmed into the ECU. All engine protection sensors, including coolant temperature and oil pressure, must be installed if engine protection is specified. Otherwise, a fault will be detected and the fault lamp will light. The engine derate schedules will not be active but the engine will shutdown in 30 seconds if a "Shutdown" fault is detected. The "Warning" lamp lights when a "Warning" fault is detected by the ECU. The "Shutdown engine" lamp will be on for 30 seconds before shutting down when a "Shutdown" fault is detected. The operator may delay a shutdown for 30 seconds by pushing a "Shutdown Override" button. On an ECU with the Shutdown feature, shutting down the engine and turning "off" the key switch will reset the engine Shutdown feature and will allow at least 30 seconds of running after restart. After 30 seconds, the engine will again shutdown unless the "Shutdown" fault condition has cleared. The "Shutdown Override" switch resets the shutdown timer to 30 seconds, and may be used repeatedly. However, continuously holding down the "Shutdown Override" switch will only reset the 30-second timer once. It must be released and repressed to reset for another 30 seconds.

Derate Protection with Shutdown

The engine derate and shutdown feature is only in ECU's with engine derate and shutdown protection programmed into the ECU. All engine protection sensors, including coolant temperature and oil pressure, must be installed if engine protection is specified. Otherwise, a fault will be detected, and the fault lamp will light. The engine derate schedules will be active and the engine will shutdown in 30 seconds if a "Shutdown" fault is detected. The "Warning" lamp lights when a "Warning" fault is detected by the ECU. The "Shutdown engine" lamp will be on for 30 seconds before shutting down when a "Shutdown" fault is detected. The operator may delay a shutdown for 30 seconds by pushing a "Shutdown Override" button. On an ECU with the shutdown feature, shutting

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External Derate and Shutdown Inputs

Two additional inputs are provided for external derates and shutdown. These inputs can be used to allow the OEM to trigger a 20% reduction in engine power or an engine shutdown from external switches, such as a loss of prime switch or hydraulic overtemperature switch. These switches are active on all ECU’s, even if “No Protection” is specified. If the user doesn’t wish to use this feature, the wires should be left disconnected.

Service Diagnostics

Fault codes generated by the ECU are stored for later retrieval through the Diagnostic Gauge.

Fuel Temperature Compensation

Fuel temperature compensation provides constant power regardless of fuel temperature.



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