ECU-750 INSTRUCTION MANUAL

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Customer and Service

Abstract

The Required Information for Operations and Trouble Shooting

ECU750 INSTRUCTION MANUAL

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750 ENGINE GAUGE CONTROLLER

The ECU-750 Gauge Controller is a rugged unit allowing for receipt of Gauge Data via a CAN BUS communications link when connected to a CAN enabled controller. Using Automotive Level Gauge Technology the unit properly Displays Data transmitted by the Engine Controller Module (ECM). The information is all transmitted digitally to the 750 Gauge unit. The Gauge unit then manipulates the data to a degrees of rotation value to the Gauge motors. The lens is ultrasonically welded to the unit and cannot be removed.

In addition to the Gauge Function the 750 is a fully capable Engine Control with the ability to do Crank Cycling and Detection of Engine Started via RPM data from the engine. It will also stop the engine for Oil or Temperature Severe conditions via DM1 or PGN data depending on Engine type. The unit includes an overspeed function as well.

BASIC OPERATION OF THE CONTROL

When the unit receives a "key on" power signal the control locks power on via a latched input system to the Battery of the Engine System. The unit then zeros all the gauges and begins presenting data in about 2 to 3 seconds from key on. As long as the key on signal is maintained the unit will continue to operate.

At the same time the gauges are being zeroed the unit performs a Lamp Test function and verifies CAN BUS operation. If all this is satisfactory the unit will send a Starter signal which the Customer should connect to a pilot relay to avoid excessive current being drawn on the unit. It also supplies voltage for the Fuel/ECM key switch input. Upon the speed coming up the engine will crank terminate and illuminate the Engine Started (Green LED) on the faceplate.

If the engine does not supply an engine speed that matches a cranking speed value then the engine will stop cranking and the unit will stop with the Over Speed and Over Crank LEDS on at the same time signifying either a CAN BUS failure or Speed Pickup failure. This can also happen during run time at 1800 RPM if the speed link breaks the ECU750 will shut down the engine since it no longer has the required data for engine Over Speed or fault inputs.

When properly connected to an Engine Control Module (ECM), starting relay and power switch connection to the ECM the control is ready for service. The standard configuration uses two external toggle switches. One for the Auto-Off-Manual function and one for the System Check (momentary) feature if provided.

These two switches work as follows:

Upon placing the switch in the Manual position the Control will in 1 second do a quick systems check of the LEDS and verify CAN (Controller Area Network) communications with the ECM. If communications are correct the Control will signal via the Starter output to begin Engine cranking. Based on the OEM settings this can be a single or multiple crank attempt with rest cycles. Depending on the Engine and temperature there may be a glow plug or air inlet heater time that will hold the control until the ECM is ready for engine cranking. Upon Engine cranking the output of the Speed MPU on the ECM is monitored to assure a stream of proper RPM data is being supplied. Upon proper RPM being achieved the Control will depower the starter and the engine will begin operation. At all times all DM1 (live messages) are being monitored. Control based items are also being observed including CAN bus communications, fuel levels and others depending on engine model and control type.

The second switch is used as a Fleet operations tool. With the manual-off-auto switch in the off position you can activate the Systems Check Diagnostic Switch and the system will power up the control and the fuel and battery can be viewed on the Gauges. The engine is not started or the ECM powered up for this test.

DIAGNOSTIC MODE:

If the Systems Diagnostic Switch is held on and then the auto-off-manual switch is put in the manual position the unit enters into System Diagnostic Mode. This powers ups the ECM (but does not initiate cranking) and all DM1 messaging is streamed to the Control allowing full monitoring. This allows Engine Manufacturers to connect to the unit with their service tools since the ECM is now powered up.

This mode is for electronic system interaction only.

DO NOT ATTEMPT ANY MECHANICAL MAINTENANCE ON THE ENGINE IN THIS MODE SINCE THE ENGINE CAN ACCIDENTALLY START UP. ALWAYS REMOVE THE BATTERY CONNECTIONS PRIOR TO ENGINE SERVICE ACTIVITIES.

OPERATING MODE:

Once Started vital engine data will be displayed on the Gauge screen. The Engine Started LED (Green) will be illuminated also.

Standard faults:

If High Engine Temperature or Low Oil Pressure Severe Level on a DM1 package or PGN based bits are set the unit will Shut Down the engine and illuminate the proper LEDS.

If the engine does not start the Overcrank LED will be turned on and run signal is removed from the ECM.

If the engine drops below the Crank Terminate speed the ECU750 will stop the engine due to this large underspeed condition. In this condition the Overcrank LED will blink letting you know the underspeed has occurred.

UNKNOWN FAULTS:

Faults that the ECM shuts down the engine for that are not the Standard Faults will cause an "underspeed condition" to occur which will be shown by the Overcrank lamp blinking. If you know you have fuel in the engine and this occurs you will need an engine service monitor to find out the problem.

STANDARD RUN:

Placing the switch in the Manual Position will start the engine. Placing it in OFF will stop the engine. See all items on this page to describe all the actions taken during engine on switch cycles.

AUTO MODE:

If the Auto position is selected the system uses a simple jumper approach showing Remote Start Contacts taking power from the Auto Position to the Manual Position. Opening the Remote Start Contact or moving the switch to the OFF position will stop the engine.

GLOW HOLD:

If your system has a glow Hold feature from the engine system the Engine Started Lamp will blink slowly letting you now you are in glow hold. As soon as the glow hold is complete the lamp will be turned off and the engine will start.

STANDARD OFF:

Upon the key On signal being removed the unit will then zero the gauges and then within a few seconds power off. There is absolutely no power draw by the unit in off condition. The Power to the ECM will be removed thus stopping the Engine.

CAN BUS FAULT:

If during a key On cycle the control loses communication with the ECM all gauges will go to a "maximum clockwise pointer condition" thus showing the operator that the system no longer is receiving valid data. This will most often be caused by a broken communications wire. The engine control will show the Overcrank and Overspeed Lamps on also.

FUEL SENDER:

The unit direct Connects to a Fuel Sender with a 30 ohm (full) to 240 ohm (empty) resistive sender with a standard curve. If the sender is not connected the Gauge will read empty. For best results run a wired pair to the sender and do not frame ground. A single two wire sender with the ground and sender connection at the ECU750 is the most accurate wiring configuration.

BUS CONNECTIONS:

The ECU750 uses CAN BUS Technology requiring that three connections be made. Be sure the CAN High and CAN Low signals are connected and that a ground connection exists that is common to all the devices that are connected. A ground shield can be connected at the end of one unit if you use shielded twisted pair wire (recommended). Also for full noise immunity and proper operation connect a 120 ohm resistor 1/2W at both ends of the cable.

TROUBLE SHOOTING:

1. Be sure that power and ground are attached and that the key switch voltage is applied properly. If the unit does not zero the needles on power up and its connected properly then the unit may need to be replaced.

2. Assuming the unit is zeroing the needles in Step 1 and your gauges are still all fully clockwise then Check cables thoroughly. Try reversing the CAN High and CAN Low connections on the terminal.

3. If all the above does not work you may need to replace the unit.

CARE OF THE POLYCARBONATE LENS:

Rinse lens with mild soap and lukewarm water using a soft cloth. DO NOT SCRUB or use brushes or squeegees. Rinse and dry with a soft cloth.

If a scratch needs to be removed a company called NOVUS has 3 levels of rubbing compounds that may bring back the unit to a serviceable condition.

SPECIFICATIONS:

DC voltage operations range: 9 to 30 VDC

Basic model without constant on is 0.000 amps in Standby

Current consumption typical on: 150 to 250 mA

Master Fuse inline input rating: 5 Amps

Temperature Range of Control System: -40 to +85C

LED Indicator Temperature -40 to +85C

Max total current output of Starter and Fuel outputs: 5 Amps

DC Auxiliary Output relays Normally Open if included: 2 Amps DC

Input signals: 0 to 30 VDC

Fuel Input Sender: 30 ohms(full) to 240 ohms(empty) standard curve

Relay cycle life at load 50,000 cycles

Communications bus: CAN bus 250 KBaud, Terminator provided by Customer

Communications Ports Total: 1 CANBUS

Weight: 1.5Lbs Approximate

Encapsulant: Epoxy Fire Resistant Self-Extinguishing

Overlay: UV resistant, Water Resistant

Connectors: Plug type Polyamide with 15 amp ratings Euro Style

Standard 5 amp relay outputs: 2

Fuel Input: 30 to 240 ohm Standard

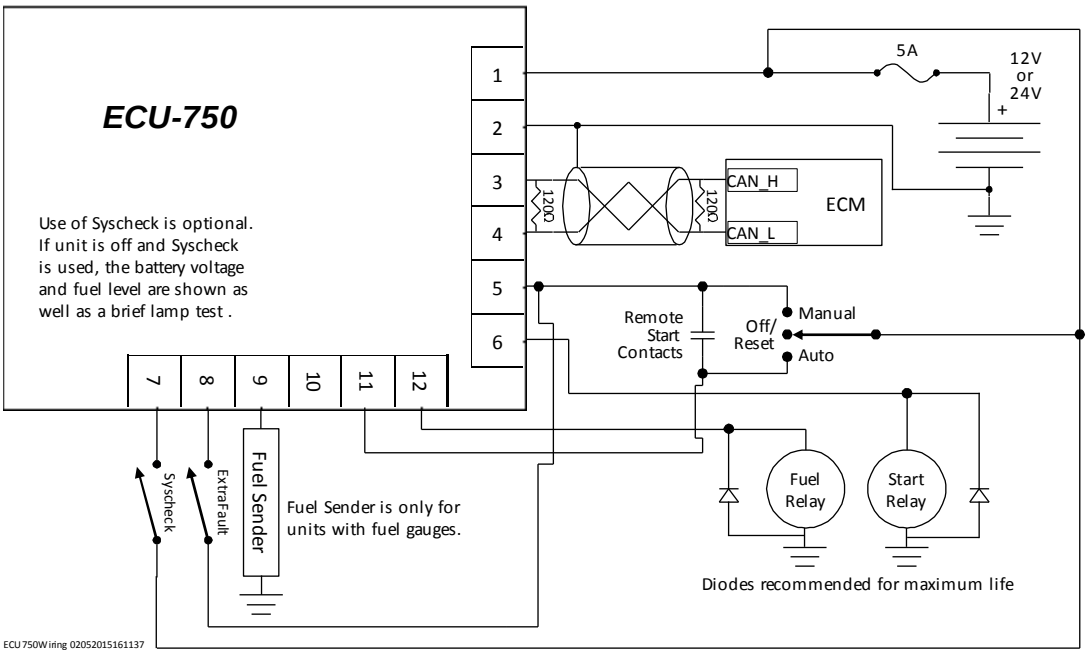
Inputs: 3 inclusive of Fuel Input

Mounting Bolts: 8-32 1/2 inch long (4 places)

Dimensions: See detail drawing

WIRING DIAGRAM

Preferred ECU-750 Wiring



DISCLAIMER AND STANDARD WARRANTY

Not responsible for typographical errors.

Request copy of Current Warranty and Exclusions

Specifications Subject to Change without Notice