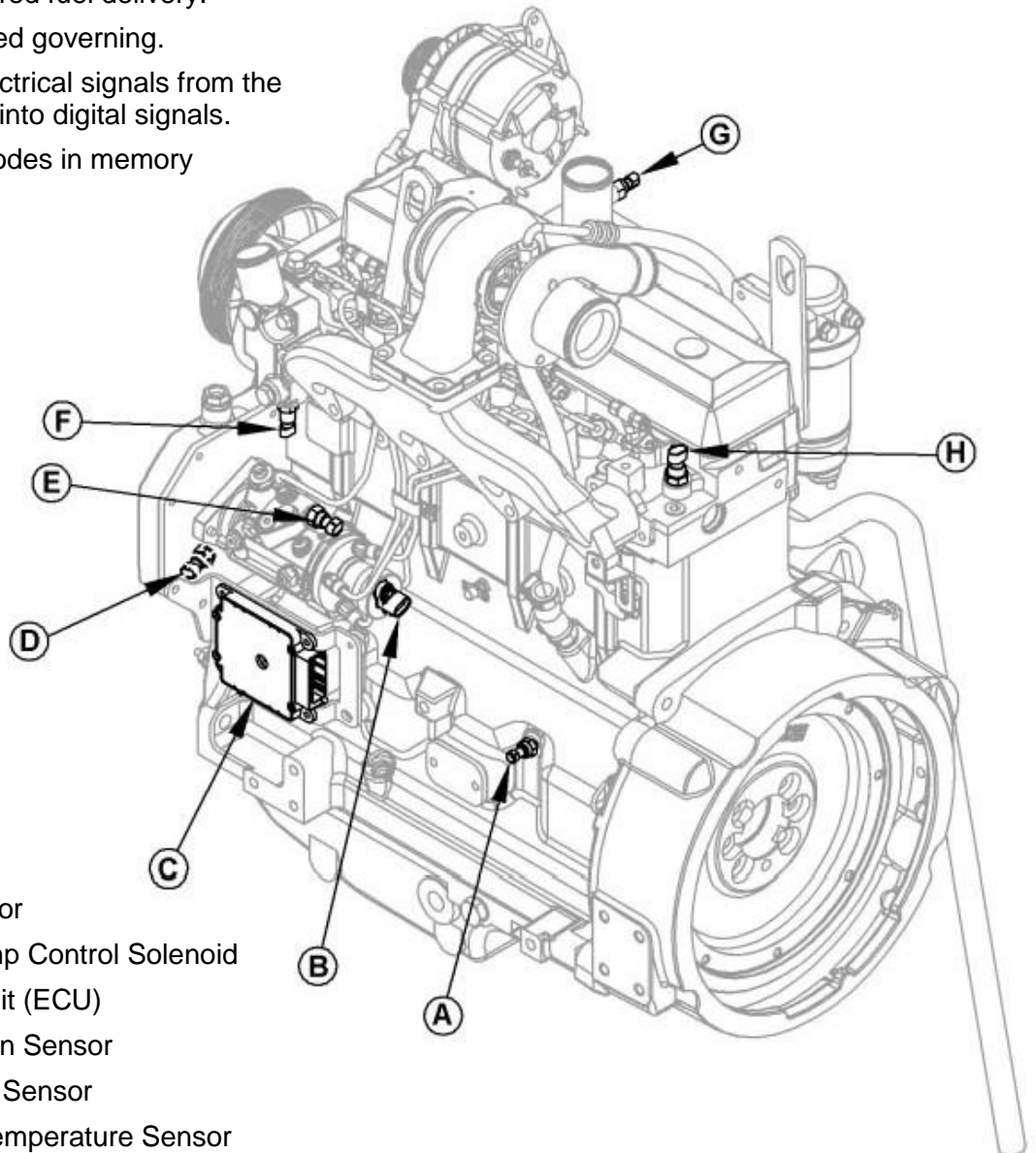


JOHN DEERE LEVEL 12 - ECU

The Engine Control Unit (ECU) performs the following functions:

- Controls fuel injection pump control valve solenoid for desired fuel delivery.
- Provides all speed governing.
- Converts the electrical signals from the various sensors into digital signals.
- Stores trouble codes in memory



- A. Oil Pressure Sensor
- B. Fuel Injection Pump Control Solenoid
- C. Engine Control Unit (ECU)
- D. Crankshaft Position Sensor
- E. Fuel Temperature Sensor
- F. Engine Coolant Temperature Sensor
- G. Manifold Air Temperature Sensor
- H. Loss of Coolant(optional) Temperature

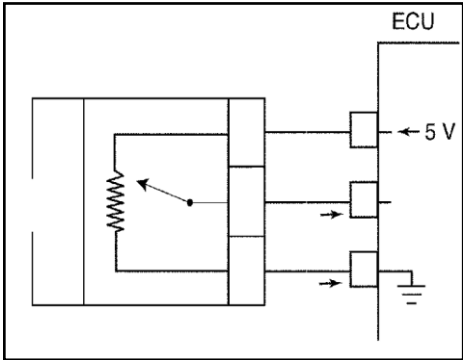
CAUTION

IMPORTANT

When troubleshooting or testing sensors and switches always isolate (completely disconnect) the ECU, accidental sparks can damage ECU.

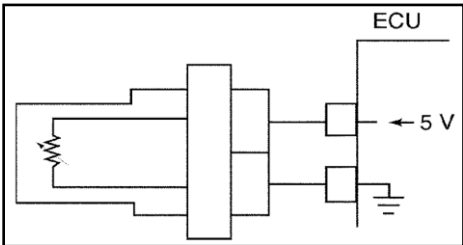
Measuring Pressure: The system's pressure sensors are 3 wire variable resistors. As the pressure changes, the sensor resistance changes. The ECU sends a 5 volt reference voltage to the sensor monitoring the voltage returning on the sensor signal wire and compares the voltage drop to the preprogrammed values in the ECU's memory to determine pressure. In addition to pressure sensors, some applications use pressure switches. Pressure switches close when a specific pressure is reached.

- ECU provides – **5 VOLTS** to sensor.
- ECU monitors voltage drop values.



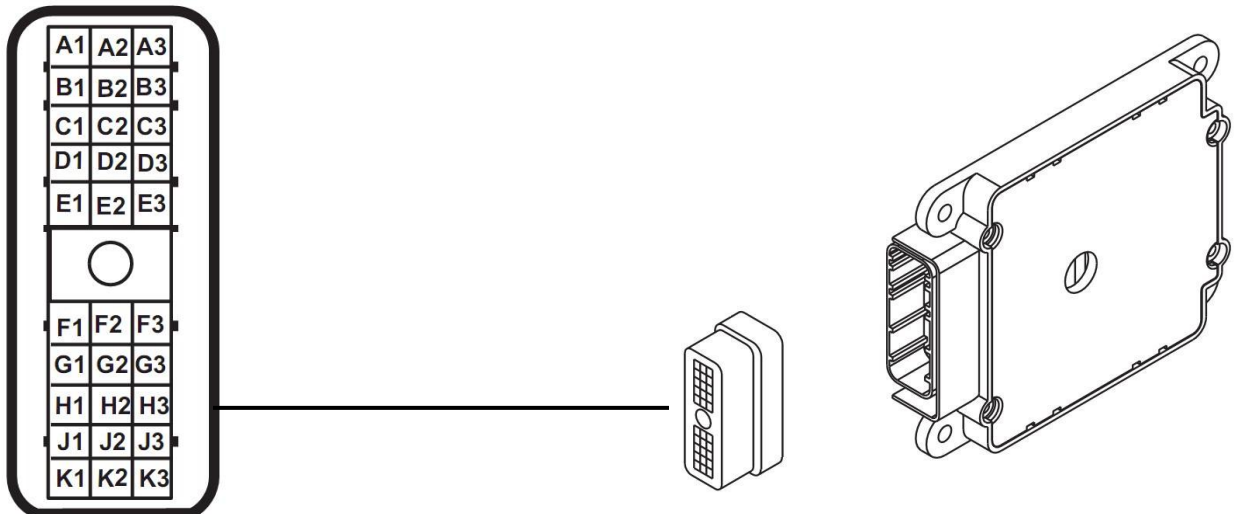
Measuring Temperature: The Engine Coolant Temperature sensor, Loss of Coolant Temperature Sensor, Manifold Air Temperature Sensor and Fuel Temperature Sensor are thermistors (temperature sensitive variable resistors). The sensors' resistance goes down as the temperature that it is exposed to goes up (negative temperature coefficient). Higher temperatures result in lower voltages and lower temperatures result in higher voltages. The ECU sends 5 volts to the sensor, monitors the voltage drop across the sensor, and compares the voltage drop to preprogrammed values in the ECU's memory in order to determine temperature. In addition to temperature sensors, some applications use temperature switches. The loss of coolant temperature switch is an example. Temperature switches close when a specific temperature is reached

- ECU provides – **5 VOLTS** to sensor.
- ECU monitors voltage drop values.

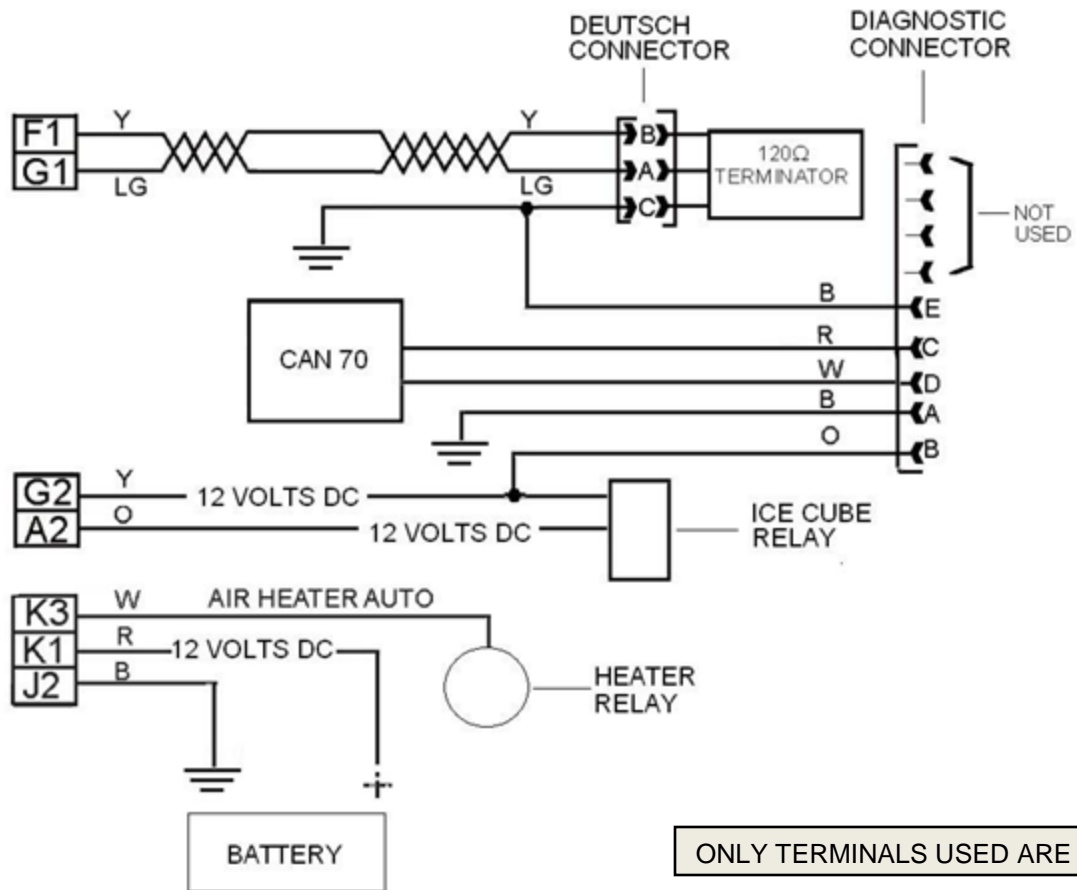
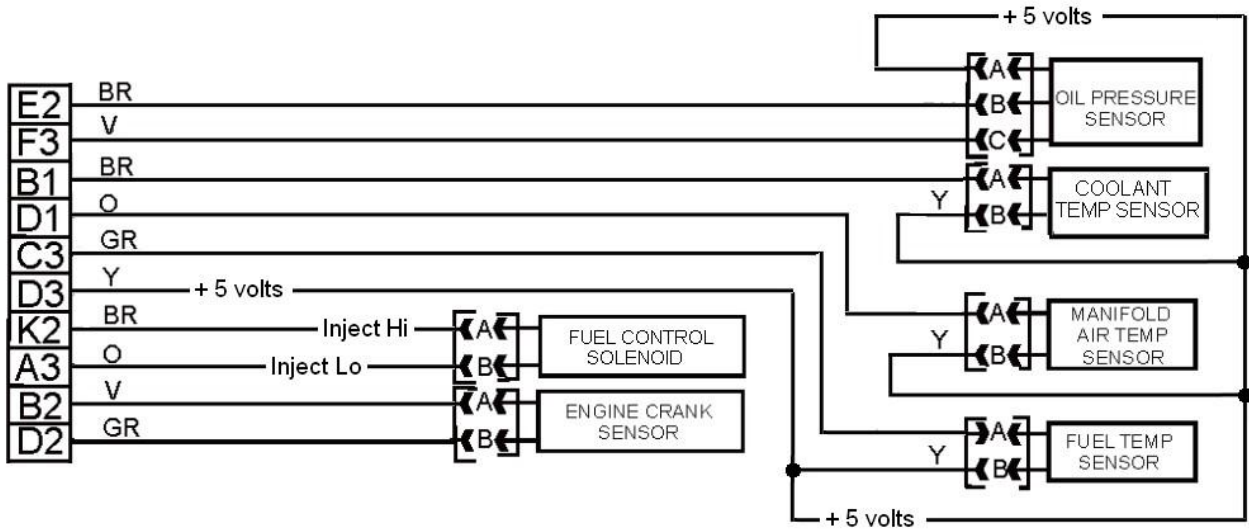




ECU Terminal Function	ECU Terminal #
Switched Battery	A2
Unswitched Battery	K1
System Ground	J2
CAN High	G1
CAN Low	F1
5V Sensor Supply	E2
Sensor Ground	D3
Analog Throttle (A) Input	E1
Analog Throttle (B) Input	F2
Multi-state Throttle Input	C1
Crank Position Input	B2
Crank Position Return	D2
Pump Solenoid Return	A3
Pump Solenoid Supply	K2
Fuel Temperature Input	C3
Engine Coolant Temperature Input	B1
Manifold Air Temperature Input	D1
Oil Pressure Input	F3
Auxiliary Engine Shutdown Switch Input	A1
External Engine Derate Switch Input	C2



L-12 - ECU



ONLY TERMINALS USED ARE SHOWN



ITEM	MEASUREMENT	SPECIFICATION
Coolant Temperature Sensor – in thermostat housing	TORQUE:	15 N·m (11 lb-ft)
Loss of Coolant Temperature – in cylinder head	TORQUE:	35 N·m (26 lb-ft)
Crankshaft Position Sensor	TORQUE:	14 N·m (10 lb-ft)
Oil Pressure Sensor	TORQUE:	15 N·m (11 lb-ft)
Manifold Air Temperature Sensor	TORQUE:	10 N·m (7 lb-ft)
Fuel Temperature Sensor	TORQUE:	13 - 18 N·m (10 - 13 lb-ft)
Fuel Heater	TORQUE:	9 N·m (7 lb-ft)
Fuel Injection Nozzle Delivery Lines	TORQUE:	27 N·m (20 lb-ft)
Fuel Injection Nozzle Return Line	TORQUE:	27 N·m (20 lb-ft)