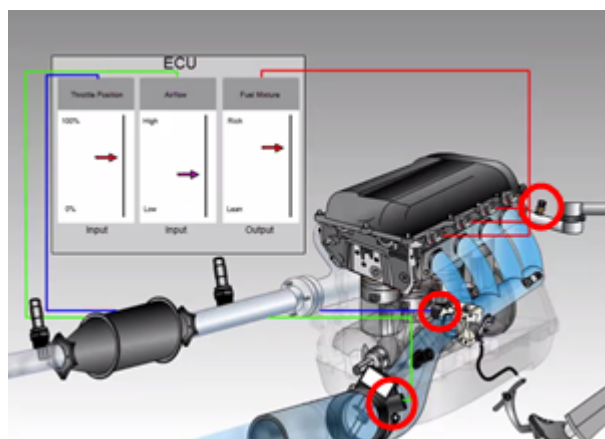
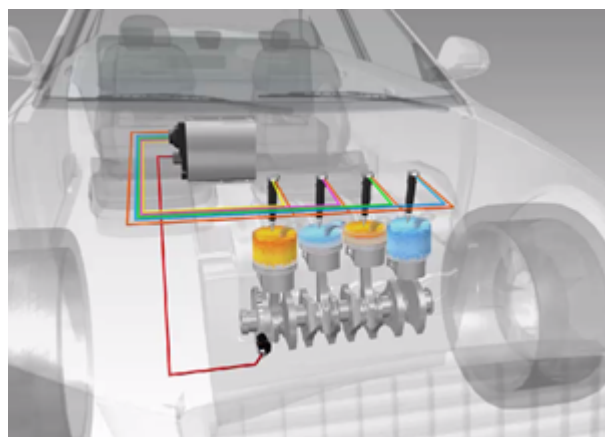


# Engine Management



The ECU uses a variety of sensors to determine the appropriate amount of fuel to inject for each cycle.



The ECU also manages hundreds of other functions to ensure the engine runs with maximum power and efficiency.

Manufacturers refer to the engine management computer with a variety of names, such as Engine Control Unit (ECU), Engine Control Module (ECM), Powertrain Control Module (PCM), Digital Motor Electronics (DME), etc. We will use the term Engine Computer or ECU for simplicity.

The ECU is a preprogrammed computer that performs several functions.

The most basic function is to deliver the correct amount of fuel to the cylinders for an efficient combustion. This is done via a basic setting, and a fine tuning. The basic setting on most vehicles takes an input from the Mass Airflow Sensor and Intake Air Temperature Sensor (to determine the amount of air entering the engine), the Coolant Temperature Sensor (to determine the overall engine temperature) and the sometimes the Throttle Position Sensor (to determine the drivers requirement of acceleration). These input numbers are compared to a preset table showing the length of time that the fuel injectors should spray in order to have the correct fuel/air mixture. The fine tuning is performed by analysing the exhaust gasses using the oxygen sensors, and adjusting the mixture slightly to increase or decrease the amount of free oxygen after combustion.

Other functions performed by the ECU include adjusting spark timing, regulation of the exhaust gas recirculation system, monitoring the catalyst efficiency, controlling the Evaporative Emissions system, monitoring misfires, controlling the battery charge level, testing for the correct voltage and resistance in each engine management circuit, ensuring that the engine coolant is at the correct

# Engine Management

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temperature by controlling the radiator fans, adjusting the idle speed of the engine to compensate for steering inputs and loads from Air Conditioning or electrical devices, and adjusting valve timing to maximise power and fuel efficiency.