



Engine Management Program



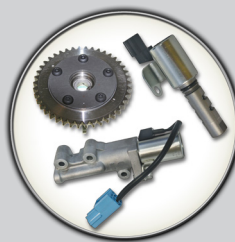
CAMSHAFT / CRANKSHAFT POSITION SENSOR

- The camshaft measures the rotation of the engine camshaft(s) to determine engine timing
- Vehicle ECU uses signal data to control fuel and ignition timing
- Located in the Cylinder Head or the Block
- The Crankshaft measures the rotation of the engine crankshaft to determine engine timing
- Vehicle ECU uses signal data to control fuel and ignition timing
- Located on the block



ENGINE COOLANT TEMPERATURE SENSOR

- Provides engine temperature data to the ECU
- Controls radiator fans, electronic thermostats, instrument displays, and more
- Located in the Engine block, Radiator, thermistor housing, and heads



ENGINE VARIABLE TIMING SOLENOIDS/ SPROCKETS

- Electronic or mechanical valves or gears used to adjust the engine's internal valves
- Used to improve performance, fuel economy, and emissions
- Located in the cylinder



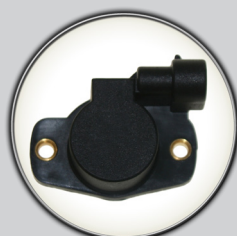
MASS AIR FLOW SENSOR

- Measures the amount of air entering the engine
- Sensor data is used to adjust fuel trims for the correct stoichiometric ratio
- Located behind the air filter in the intake



MANIFOLD ABSOLUTE PRESSURE SENSORS

- Calculate the amount and density of the air entering the engine
- Sensor data is used to adjust fuel trims for the correct stoichiometric ratio



THROTTLE POSITION SENSOR

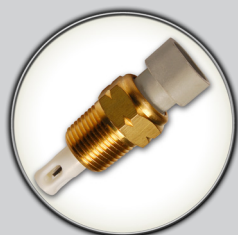
- Relays the angle of the throttle valve to the vehicle ECU
- Sensor data is used in calculating fuel trims, variable valve timing, idle air controls, and more

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AIR TEMPERATURE SENSOR

- Calculate the temperature of the air entering the engine
- Sensor data is used to adjust fuel trims for the correct stoichiometric ratio
- Located in the Air intake, Mass Air Flow sensor, and throttle body



KNOCK SENSOR

- Senses unique frequencies from the engine to ensure proper internal combustion
- Vehicle ECU uses signal data to adjust ignition timing to prevent detonation
- Located on the engine block



IDLE AIR CONTROL

- Controls the amount of air entering the engine during start up and idling
- Either controlled by vacuum or the vehicles ECU
- Located on the Throttle Body



OIL PRESSURE SENSOR

- Provides engine oil pressure data to the vehicle ECU or instrument panel
- Ensures properly functioning oil system to protect the engine either electronically or mechanically
- Located on the engine block



VEHICLE SPEED SENSOR

- Determines rotational speed and sends to vehicle ECU or instrument display
- Either electronic sensors or mechanically driven gears
- Located on the transmission, differential, or wheel bearing hub



FLEX FUEL SENSOR

- Used in Flex Fuel vehicles to calculate the amount of ethanol in the fuel system
- Vehicle ECU uses this data to adjust fuel trims and ignition timing depending on the ethanol ratio
- Located in the fuel line before the engine



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