

EXHAUST GAS RECIRCULATION (EGR) SYSTEM MONITOR

Exhaust Gas Recirculation (EGR) System Monitor

The EGR system monitor is an on board strategy designed to test the integrity and flow characteristics of the EGR system. The EGR system monitor consists of an electrical and functional test that checks the electric EGR valve and the EGR system components for correct operation.

After the vehicle has warmed up and normal EGR rates are being commanded by the PCM, the low flow check and the high flow check is carried out. The EGR flow diagnostics execute once per driving cycle and are designed to set a DTC when the total mass flow error results in an emissions increase above a calibrated level.

1. The EGR system uses inputs from the engine coolant temperature (ECT) sensor or cylinder head temperature (CHT) sensor, the intake air temperature (IAT) sensor, the crankshaft position (CKP) sensor, the manifold absolute pressure (MAP) sensor, exhaust gas recirculation temperature bank 1, sensor 2 (EGRT12), exhaust pressure (EP) sensor, differential pressure feedback EGR sensor and vehicle speed to provide information about engine operating conditions to the PCM.
2. The PCM uses the sensor inputs to determine the desired amount of EGR gas flow and controls the EGR valve to achieve the desired EGR flow rate.
3. The EP sensor (if equipped) measures the exhaust pressure by comparing the EP sensor calibrated value to the actual EP sensor value. The EP sensor is used primarily to determine EGR cooler effectiveness and is also used for converting EGR flow to EGR valve position.
4. The EGRT12 sensor (if equipped) measures the exhaust gas temperature downstream of the EGR cooler and is monitored by comparing the EGRT12 sensor calibrated value to the actual EGRT12 sensor value. The EGRT12 sensor is primarily used for EGR flow calculation and is also used for EGR cooler diagnostics.
5. The monitor checks the electric EGR valve circuits for opens and shorts. The monitor compares the differential pressure feedback EGR sensor to a calibrated value and the electric EGR valve commanded position to determine if EGR flow is present.
6. The monitor checks for the differential pressure feedback EGR sensor for opens and shorts. The differential pressure feedback EGR sensor hoses are tested for connection and restriction at idle. The PCM commands the EGR valve closed and the monitor tests for the differential pressure feedback EGR sensor to indicate no flow is present. The PCM commands the EGR valve open and the monitor tests the differential pressure feedback EGR sensor voltage to indicate flow is present. The stop start option on some vehicles requires these hose tests to run during off idle conditions.
7. The intake manifold pressure is higher when the EGR is flowing than when it is not flowing. When the exhaust gas is delivered into the intake manifold, the MAP sensor reading increases.

