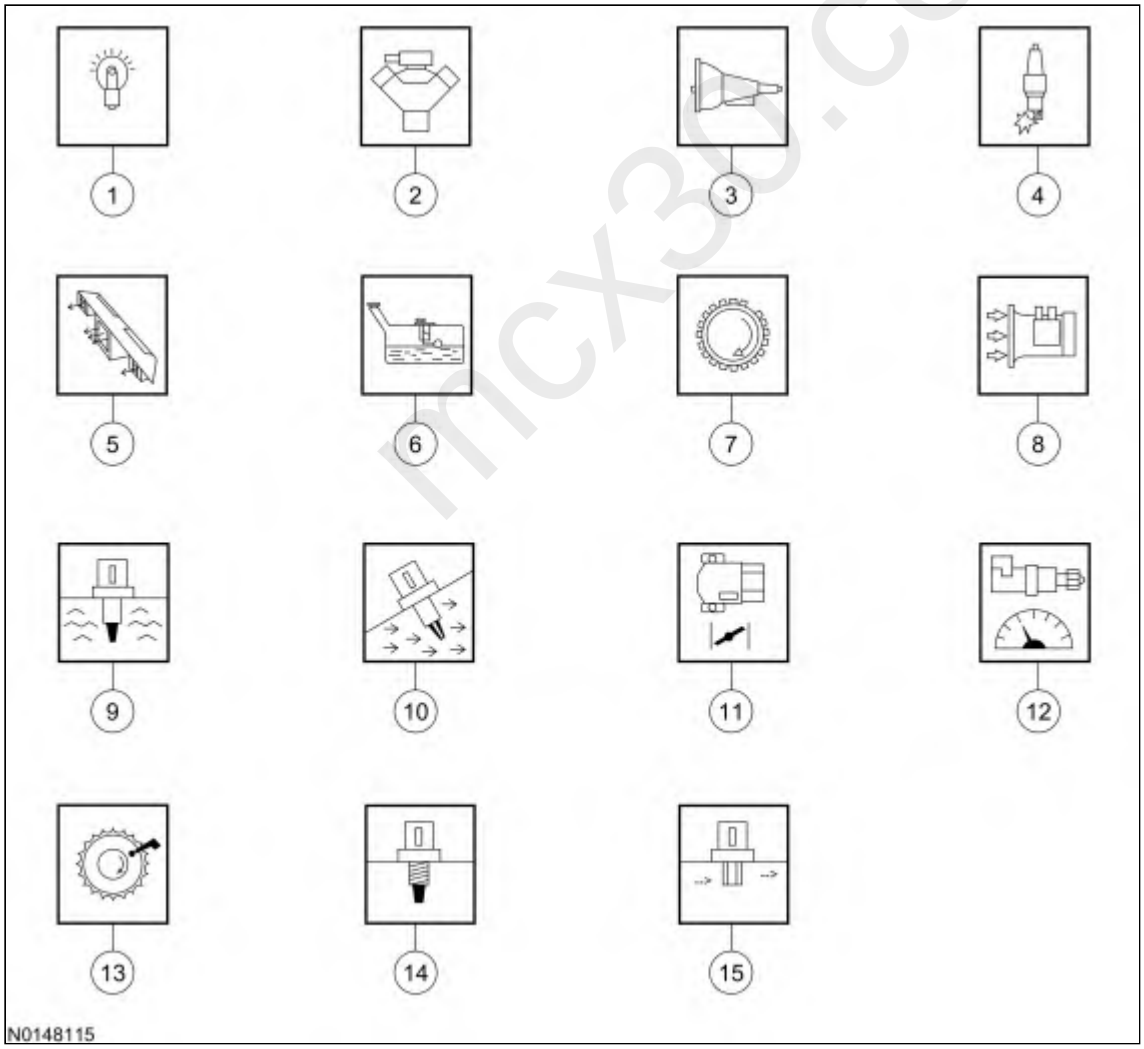
Monitor/Feature	Calibration for Gasoline Engines
Comprehensive Component Monitor (CCM)	All circuit checks, rationality and functional tests are the same as OBD II.
Communication Protocol and DLC	Same as OBD II, all generic and enhanced scan tool modes work the same as OBD II, but reflect the EMD calibration that contains fewer supported monitors. OBD supported PID indicates EMD.
MIL Control	Same as OBD II, it takes 2 drive cycles to illuminate the MIL.

The following monitor descriptions provide a general description of each OBD monitor. In these descriptions the monitor strategy, hardware, testing requirements, and methods are presented to provide an overall understanding of monitor operation. An illustration of each monitor may also be provided. These illustrations should be used as typical examples and are not intended to represent all possible vehicle configurations.

Each illustration depicts the PCM as the main focus with primary inputs and outputs for each monitor. The icons to the left of the PCM represent the inputs used by each of the monitor strategies to enable or activate the monitor. The components and subsystems to the right of the PCM represent the hardware and signals used while carrying out the tests and the systems being tested. The CCM illustration has numerous components and signals involved which are shown generically. When referring to the illustrations, match the numbers to the corresponding numbers in the monitor descriptions for a better understanding of the monitor and associated DTCs.

These icons are used in the illustrations of the OBD monitors and throughout this section.



Item	Number	Description

1	—	Malfunction Indicator Lamp (MIL)
2	—	Base Engine Components
3	—	Transmission
4	—	Ignition System
5	—	A/C Or Heater System
6	—	Fuel Level Input (FLI)
7	—	RPM
8	—	Mass Airflow (MAF)
9	—	Engine Coolant Temperature (ECT)
10	—	Intake Air Temperature (IAT)
11	—	Throttle Position (TP)
12	—	Vehicle Speed
13	—	Camshaft Position (CMP)
14	—	Cylinder Head Temperature (CHT)
15	—	Manifold Absolute Pressure (MAP)

mcx30.com

Particulate Filter Monitor

The PCM monitors the particulate filter for leaks in the filter substrate, as well as for a filter substrate that has been removed. The particulate filter requires preconditioning before the monitor is enabled. There are three tests that are carried out by the particulate filter monitor. The first test is a clog monitor comparing the restriction of the particulate filter to the expected restriction values, which are a function of exhaust flow. The second test is a severely clogged monitor that uses the same monitoring method as the clog monitor, but uses a higher restriction threshold. The third test is a missing substrate monitor that ensures the particulate filter has not been removed.

The particulate filter monitor is enabled and runs continuously when certain base engine conditions are met. The typical monitoring duration for this monitor is 10 seconds. Inputs from the crankshaft position (CKP) sensor, engine coolant temperature (ECT) sensor, exhaust gas temperature (EGT) sensor, mass airflow (MAF) sensor (if equipped), and particulate filter pressure sensor is required to enable the monitor. The monitor entry conditions include:

- exhaust flow between 300 - 850 m^3/hour (14,126 - 40,023 ft^3/hour)
- no fuel injector concerns

For the clog monitor test, the PCM determines a pressure threshold value for the amount of pressure that should be present in the filter for a calibrated exhaust flow rate. The PCM compares the measured pressure to the pressure threshold value. A fault filtering metric starts when the clog monitor begins to run. When the measured pressure is greater than the pressure threshold, the metric value increases. When the measured pressure is less than the pressure threshold, the metric value decreases. If the metric value at the end of the clog monitor exceeds a calibrated limit, a DTC sets, and the malfunction indicator lamp (MIL) illuminates.

The severely clogged monitor test works the same way same way as the clog monitor test, but uses a higher restriction threshold.

For the missing substrate monitor test, the PCM determines a pressure threshold for the amount of pressure that should be measured by the particulate filter pressure sensor, for a calibrated exhaust flow rate. The PCM compares the measured pressure value to the pressure threshold value. A fault filtering metric starts when the missing substrate monitor begins to run. When the measured pressure is less than the threshold value, the metric value increases. When the measured pressure is greater than the threshold value, the metric value decreases. If the metric value at the end of the missing substrate monitor exceeds a calibrated limit, a DTC sets, and the MIL illuminates.

mc20.com

Positive Crankcase Ventilation (PCV) System Monitor

The PCV system monitor consists of a modified PCV system design. The PCV system is designed to prevent accidental disconnection. High retention force molded plastic lines are used from the valve cover to the intake manifold. The diameter of the lines and the intake manifold entry fitting are increased so that disconnection of the lines may cause an engine to stall. In the event the vehicle does not stall if the line between the intake manifold and PCV system is disconnected, the vehicle has a large vacuum leak that causes the vehicle to run lean at idle. The lean condition illuminates the malfunction indicator lamp (MIL) and stores a lean bank 1 or bank 2 DTC.

The PCV monitor sets a DTC if the PCV vacuum hose is disconnected, or if a large air leak between the throttle body and intake valves is present. An idle speed symptom may be present when the DTC is set.

The PCV system on some vehicles will include a crankcase pressure sensor to detect a disconnection of the fresh air hose. A disconnection of the fresh air hose would allow the discharge of crankcase vapor into the atmosphere while the engine was under boost. The fresh air hose connects the intake air system to the valve cover, with the crankcase pressure sensor mounted in the fresh air hose. The PCV monitor will detect a fresh air hose disconnection at the intake air system or the valve cover, by monitoring crankcase pressure sensor changes during engine cranking, and driving with higher intake airflow.

For additional PCV information, refer to Positive Crankcase Ventilation (PCV) System in this section.

mcx30.com