



Ford Crown Victoria & OBD/IM Readiness

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What Is OBD?

- ❑ Real-time, on-board monitoring system that is embedded in the Powertrain Control Module (PCM).
- ❑ Monitors all emission related components and systems as mandated by government agencies like EPA and CARB.
- ❑ Fault is communicated to the customer by means of the “Check Engine” light, also known as the Malfunction Indicator Light (MIL), along with a Diagnostic Trouble Code (DTC) set in the PCM.

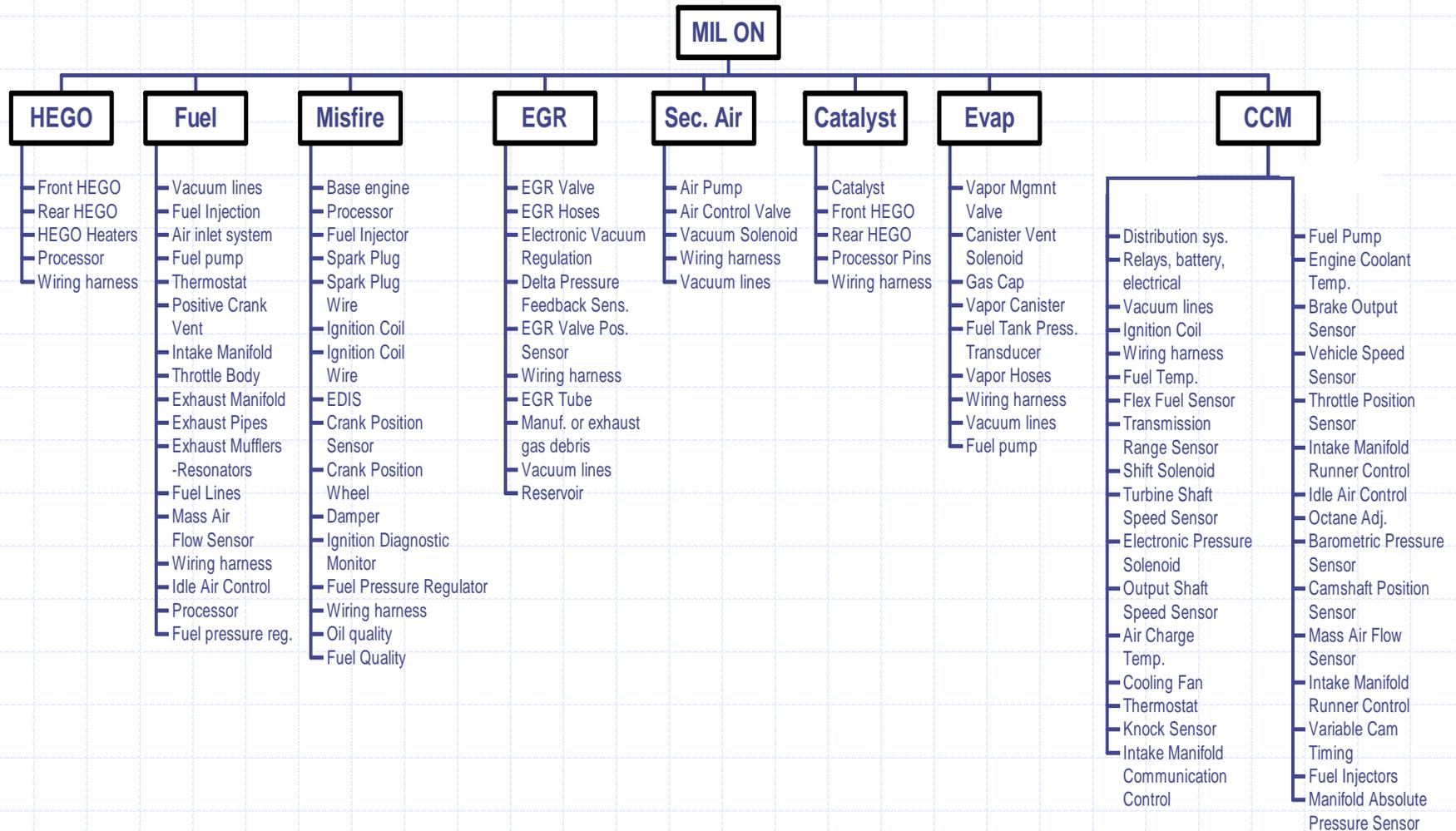
Brief History Of OBD

- ❑ OBD-I was implemented for 1988 and later model year vehicles.
- ❑ Monitoring limited to –
 - Oxygen Sensor
 - EGR System
 - Fuel System
 - Input Components
- ❑ MIL illuminated only while the fault is present.
- ❑ OBD-II was implemented across all vehicle lines in 1996 model year vehicles.
- ❑ Monitoring extended to include –
 - Oxygen Sensor (enhanced)
 - EGR System (enhanced)
 - Fuel System (enhanced)
 - Input/Output Components (CCM)
 - Catalyst Efficiency
 - Misfire
 - Evaporative System
 - Secondary Air System
- ❑ MIL is illuminated and remains on until there are 3 consecutive trips without the fault being present.

OBD Monitors

- Misfire
- Exhaust Gas Re-circulation (EGR)
- EVAP
- Heated Exhaust Gas Oxygen Sensor (HEGO)
- Catalyst Efficiency
- Fuel
- Secondary Air
- Comprehensive Component Monitoring (CCM)

What Turns On The MIL?



Fault Filtering

- ❑ Typically, circuit faults have to be present for 5 consecutive seconds before a DTC is stored.
- ❑ DTC is stored if fault is detected.
- ❑ MIL is illuminated only if fault is present for 2 consecutive drive cycles.
- ❑ The MIL is turned off after 3 consecutive trips without the fault being present.
- ❑ The DTC is erased from memory after 40 warm-ups without the fault being present.

P1000 Code & IM Readiness

- ❑ **"P1000" code. Don't look at a P1000 code as a fault code.** I/M programs look at a set of I/M Readiness flags that tell which OBD monitors a vehicle has, and which have been run since codes were last cleared (or battery disconnected).

 - ❑ EPA's OBD Technical Guidance, applicable to testing of 1996 and later Model Year light duty vehicles (\leq 8500 lbs. GVWR) allows:
 - ✓ no more than two unset readiness monitors for 1996 through 2000 Model Year vehicles
 - ✓ and no more than one unset readiness monitor for 2001 and newer Model Year vehicles.
 - ✓ Note that the Guidance is not applicable to vehicles which exceed 8500 lbs GVWR. States are, however, allowed to conduct such testing, but readiness criteria for either rejection from testing or pass/fail determination may vary among states.

 - ❑ **Not all monitors need to be run in order to get through an I/M test.** When you eliminate the P1000, it means all monitors have been run, even though the EPA requirement could have allowed up to two monitors to be not ready.
- *To run all the monitors when it is not necessary, is a waste of time and resources.**

How Do I Pass The OBD II Emission Inspection?

- ❑ Essentially, five things must be satisfied to pass the inspection:
 1. The emissions MIL must illuminate with the key on and engine off;
 2. The emissions MIL must be commanded off by the OBD II system, and:
 3. Required readiness monitors must be completed.
 4. No MIL with the key on engine running (KOER)
 5. Must have communication

*You can easily verify that you will pass the 1st criteria by confirming that the MIL bulb lights up when the key is turned to the engine on position (but not started). You can then start the engine and see if the MIL stays on. If it is on, you will fail the 2nd criteria, so your vehicle must be repaired before you can pass the test.

My Taxi Didn't Pass

Now What Do I do?

- It depends on why it didn't pass.
 - If the emissions MIL is on, the OBD II system has found a problem that needs to be fixed.
 - If the MIL won't light, then the bulb and/or circuitry must be repaired.
 - If the required readiness monitors are not set, then additional driving is required.

- * There are many reasons the monitors could be set to "not ready". Usually this is caused by routine maintenance. For instance, if the battery is disconnected for any reason, the monitors of most vehicle are reset. Also, a service technician may have to reset them as part of a repair process.

- * Essentially, the car must be driven to reset the monitors. See handout for "Drive Cycle Recommendations".

OBD Resources

- ❑ California Air Regulatory Board (CARB) OBD web site –
arbis.arb.ca.gov/msprog/obdprog/obdprog.htm

- ❑ Environmental Protection Agency web site –
www.epa.gov/OMSWWW/obd.htm

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OBDII Theory & Operation

This general description provides an overview of the OBD system used on Ford, Lincoln and Mercury vehicles since 1996. And it's free of charge, courtesy of Motorcraft® Technical Resources.

OBD-II System Summary for Ford/Lincoln/Mercury

- [OBD System Operation Summary - Model Year 2005 \(917KB\)](#)
- [OBD System Operation Summary for 6.0L Diesel - Model Year 2005 \(389KB\)](#)
- [OBD System Operation Summary - Model Year 2004 \(533KB\)](#)
- [OBD System Operation Summary for 6.0L Diesel - Model Year 2004 \(300KB\)](#)
- [OBD System Operation Summary for 6.0L Diesel - Model Year 2003 \(286KB\)](#)
- [OBD System Operation Summary - Model Year 2003 \(523KB\)](#)
- [OBD System Operation Summary for 7.3L Diesel - Model Year 2002 \(874KB\)](#)
- [OBD System Operation Summary - Model Year 2002 \(311KB\)](#)
- [OBD System Operation Summary for 7.3L Diesel - Model Year 2001 \(845KB\)](#)
- [OBD System Operation Summary - Model Year 2001 \(296KB\)](#)
- [OBD System Operation Summary for 7.3L Diesel - Model Year 2000 \(839KB\)](#)
- [OBD System Operation Summary - Model Year 2000 \(272KB\)](#)
- [OBD System Operation Summary for 7.3L Diesel - Model Year 1999 \(827KB\)](#)
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- [OBD System Operation Summary for 7.3L Diesel - Model Year 1998 \(777KB\)](#)
- [OBD System Operation Summary - Model Year 1998 \(227KB\)](#)
- [OBD System Operation Summary for 7.3L Diesel - Model Year 1997 \(174KB\)](#)
- [OBD System Operation Summary - Model Year 1997 \(226KB\)](#)
- [OBD System Operation Summary - Model Year 1996 \(220KB\)](#)