1. OBD II Readiness Monitors

An important part of a vehicle’s OBD II system is the Readiness Monitors, which are indicators used to find out if all of the emissions components have been evaluated by the OBD II system. They are running periodic tests on specific systems and components to ensure that they are performing within allowable limits.

Currently, there are eleven OBD II Readiness Monitors (or I/M Monitors) defined by the U.S. Environmental Protection Agency (EPA). Not all monitors are supported by all vehicles and the exact number of monitors in any vehicle depends on the motor vehicle manufacturer’s emissions control strategy.

Continuous Monitors -- Some of the vehicle components or systems are continuously tested by the vehicle’s OBD II system, while others are tested only under specific vehicle operating conditions. The continuously monitored components listed below are always ready:

1) Misfire
2) Fuel System
3) Comprehensive Components (CCM)

Once the vehicle is running, the OBD II system is continuously checking the above components, monitoring key engine sensors, watching for engine misfire, and monitoring fuel demands.

Non-Continuous Monitors -- Unlike the continuous monitors, many emissions and engine system components require the vehicle to be operated under specific conditions before the monitor is ready. These monitors are termed non-continuous monitors and are listed below:

1) EGR System
2) O2 Sensors
3) Catalyst
4) Evaporative System
5) O2 Sensor Heater
6) Secondary air
7) Heated Catalyst
8) A/C system
2. OBD II Monitor Readiness Status

OBD II systems must indicate whether or not the vehicle’s PCM’s monitor system has completed testing on each component. Components that have been tested will be reported as “Ready”, or “Complete”, meaning they have been tested by the OBD II system. The purpose of recording readiness status is to allow inspectors to determine if the vehicle’s OBD II system has tested all the components and/or systems.

The powertrain control module (PCM) sets a monitor to “Ready” or “Complete” after an appropriate drive cycle has been performed. The drive cycle that enables a monitor and sets readiness codes to “Ready” varies for each individual monitor. Once a monitor is set as “Ready” or “Complete”, it will remain in this state. A number of factors, including erasing of diagnostic trouble codes (DTCs) with a scan tool or a disconnected battery, can result in Readiness Monitors being set to “Not Ready”. Since the three continuous monitors are constantly evaluating, they will be reported as “Ready” all of the time. If testing of a particular supported non-continuous monitor has not been completed, the monitor status will be reported as “Not Complete” or “Not Ready.”

In order for the OBD monitor system to become ready, the vehicle should be driven under a variety of normal operating conditions. These operating conditions may include a mix of highway driving and stop and go, city type driving, and at least one overnight-off period. For specific information on getting your vehicle’s OBD monitor system ready, please consult your vehicle owner’s manual.

3. OBD II Definitions

**Powertrain Control Module (PCM)** -- OBD II terminology for the on-board computer that controls engine and drive train.

**Malfunction Indicator Light (MIL)** -- Malfunction Indicator Light (Service Engine Soon, Check Engine) is a term used for the light on the instrument panel. It is to alert the driver and/or the repair technician that there is a problem with one or more of vehicle's systems and may cause emissions to exceed federal standards. If the MIL illuminates with a steady light, it indicates that a problem has been detected and the vehicle should be serviced as soon as possible. Under certain conditions, the dashboard light will blink or flash. This indicates a severe problem and flashing is intended to discourage vehicle operation. The vehicle onboard
diagnostic system can not turn the MIL off until the necessary repairs are completed or the condition no longer exists.

**DTC** -- Diagnostic Trouble Codes (DTC) that identify which section of the emission control system has malfunctioned.

**Enabling Criteria** -- Also termed Enabling Conditions. They are the vehicle-specific events or conditions that must occur within the engine before the various monitors will set, or run. Some monitors require the vehicle to follow a prescribed “drive cycle” routine as part of the enabling criteria. Drive cycles vary among vehicles and for each monitor in any particular vehicle.

**OBD II Drive Cycle** -- A specific mode of vehicle operation that provides conditions required to set all the readiness monitors applicable to the vehicle to the “ready” condition. The purpose of completing an OBD II drive cycle is to force the vehicle to run its onboard diagnostics. Some form of a drive cycle needs to be performed after DTCs have been erased from the PCM’s memory or after the battery has been disconnected. Running through a vehicle’s complete drive cycle will “set” the readiness monitors so that future faults can be detected. Drive cycles vary depending on the vehicle and the monitor that needs to be reset. For vehicle specific drive cycle, consult the vehicle’s Owner’s Manual.

**Freeze Frame Data** -- When an emissions related fault occurs, the OBD II system not only sets a code but also records a snapshot of the vehicle operating parameters to help in identifying the problem. This set of values is referred to as Freeze Frame Data and may include important engine parameters such as engine RPM, vehicle speed, air flow, engine load, fuel pressure, fuel trim value, engine coolant temperature, ignition timing advance, or closed loop status.
4. Product Information

4.1 Tool Description

① **LCD DISPLAY** -- Indicates test results. Backlit, 128 x 64 pixel display with contrast adjustment.

② **Y BUTTON** -- Confirms a selection (or action) from a menu. When a DTC’s definition covers more than one screen, it is used to move down to the next screen for additional data.

③ **N BUTTON** -- Cancels a selection (or action) from a menu or returns to the menu. It is also used to set up the unit when being pressed and held for at least 3 seconds.

④ **UP SCROLL BUTTON** -- Moves up through menu and submenu items in menu mode. When more than one DTC is retrieved, moves up through the current screen to the previous screens for additional DTCs and definitions.

⑤ **DOWN SCROLL BUTTON** -- Moves down through menu and submenu items in menu mode. When more than one DTC is retrieved, moves down through the current screen to the next screens for additional DTCs and definitions.

⑥ **READ BUTTON** -- HOT key to retrieve DTCs without going through the menu mode.

⑦ **ERASE BUTTON** -- HOT key to erase DTCs when being pressed and held for at least 3 seconds without going through the menu mode.

⑧ **OBD II CONNECTOR** -- Connects the scan tool to the vehicle’s Data Link Connector (DLC).

⑨ **POWER BUTTON** -- Turns power ON or OFF.

⑩ **SERIAL NUMBER PLATE** -- Provides serial number of the scan tool.

⑪ **BATTERY COMPARTMENT** -- Provides power to scan tool for off-vehicle reviewing or when upgrading from a PC.
4.2 Specifications
1) Display: Backlit, 128 x 64 pixel display with contrast adjustment
2) Operating Temperature: 0 to 50°C (-32 to 122 F°)
3) Storage Temperature: -20 to 70°C (-4 to 158 F°)
4) External Power: 8.0 to 15.0 Volts provided via vehicle battery
5) Internal Power: 9V Cell battery
6) Dimensions:

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<th>Length</th>
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<td>196 mm (7.80”)</td>
<td>90 mm (3.51”)</td>
<td>34 mm (1.35”)</td>
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7) NW: 0.70kg (1.54lb), GW: 1.0kg(2.20lb)

4.3 Accessories Included
1) User’s Manual -- Instructions on tool operations
2) CD -- Includes user’s manual and DTC definitions library
3) OBD2 cable -- Provides power to tool and communicates between tool and vehicle
4) Serial Cable -- Used to upgrade the scan tool
5) Carry Case -- A nylon case to store the scan tool when not in use
6) Cell Battery -- Supplies power to the scan tool when disconnected from vehicle DLC

4.4 Navigation Characters
Characters used to help navigate the scan tool are:
1) “►” -- Indicates current selection.
2) “↓” -- A flashing Down Arrow indicates additional information is available on the next screen.
3) “↑” -- A flashing UP Arrow indicates additional information is available on the previous screen.
4) “Pd” -- Identifying a Pending DTC when viewing DTCs.

4.5 Keyboard
No solvents such as alcohol are allowed to clean the keypad or display. Use a mild nonabrasive detergent and a soft cotton cloth. Do not soak the keypad as the keypad is not waterproof.