

# OBDII EOBD & CAN Code Reader User Guide



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## 1. Safety precautions and warnings

To prevent personal injury or damage to vehicle and/or the scan tool, read this instruction manual first and observe the following safety precautions whenever working on a vehicle:

1. Always perform testing in a safe working environment
2. Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts
3. Operate the vehicle in a well ventilated work area
4. Put the vehicle in 'Park' for automatic or 'Neutral' for manual transmission and apply parking brake
5. Never leave the vehicle unattended
6. Use extreme caution when working around the ignition coil, distributor cap, ignition wires and spark plugs. These components create hazardous voltages when the engine is running
8. Keep a fire extinguisher on hand suitable for petrol/chemical and electrical fires
9. Don't connect or disconnect any test equipment while the ignition is on or the engine is running
10. Keep the scan tool dry, clean, free from oil/water or grease. Use a mild detergent on a clean cloth to clean the outside of the scan tool when necessary

## 2. General information

### 2.1 On-Board Diagnostics (OBD) II

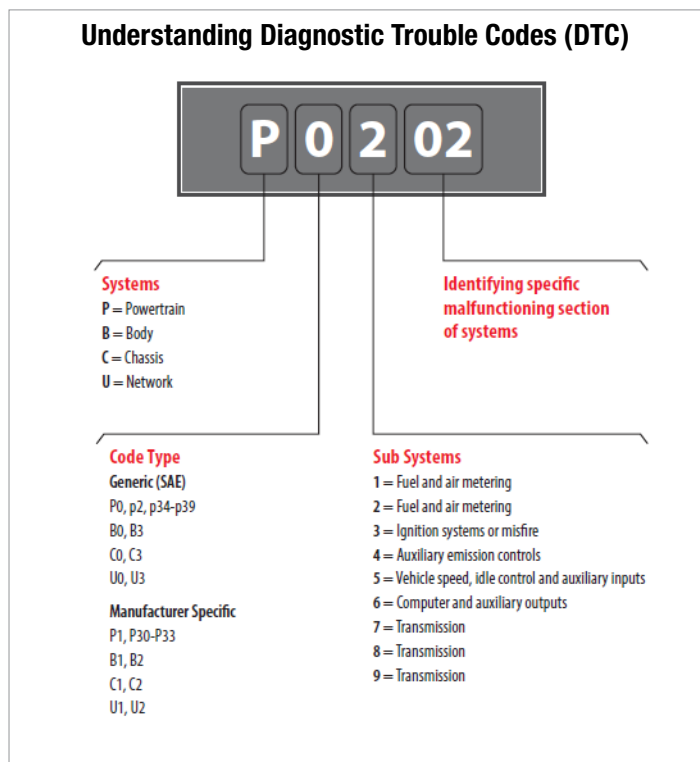
The first generation of On-Board Diagnostics (called OBD I) was developed by the California Air Resources Board (ARB) and implemented in 1988 to monitor some of the emission control components on vehicles. As technology evolved and the desire to improve the On-Board Diagnostic system increased, a new generation of On-Board Diagnostic system was developed. This second generation of On-Board Diagnostic regulations is called "OBD II". The OBD II system is designed to monitor emission control systems and key engine components by performing either continuous or periodic tests of specific components and vehicle conditions. When a fault is detected, the OBD II system turns on a Malfunction Indicator Lamp (MIL) on the vehicles instrument panel to alert the driver typically by the phrase of "Check Engine". The system will also store important information about the detected malfunction so that the technician can accurately find and fix the fault.

#### Main function of the code reader

1. Read stored Diagnostic Trouble Codes (DTC) when the Malfunction Indicator Lamp (MIL) turns on
2. Erase and clear fault codes once repair has been performed to turn off the MIL warning light
3. Readiness Monitor status

### 2.2 Diagnostic Trouble Codes (DTCs)

OBD II Diagnostic Trouble Codes are codes that are stored by the on-board computer diagnostic system in response to a fault found in the vehicle. These codes identify a particular problem area and are intended to provide you with a guide as to where a fault might be occurring within a vehicle. OBD II Diagnostic Trouble Codes consist of a five digit alphanumeric code. The first character, a letter, identifies which control system sets the code. The other four characters, all numbers provide additional information on where the DTC originated and the operating conditions that caused it to set.



### 2.3 Location of the Data Link Connector (DLC)

The DLC (Data Link Connector or Diagnostic Link Connector) is the standardised 16-cavity connector where diagnostic scan tools interface with the vehicle's on-board computer.

The DLC is usually located on the lower section of the dashboard on the drivers side, under or around the foot well even behind a trim on most vehicles (Fig.1). If you are unable to locate the Data Link Connector under the dashboard always refer to the manufactures workshop manual for location.



Fig.1

### 2.4 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 run periodic tests on specific systems and components to ensure they are performing within specifications. There are eleven OBD II Readiness Monitors. Not all monitors are supported by all vehicles and the exact number of monitors on any vehicle depends on the manufacturers 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. Below are the listed continuous monitored components

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

Once the vehicle is running, the OBD II system is continuously checking the above components, monitoring key engine sensors, detecting 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. Below are the listed non-continuous monitors

- 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

### 2.5 OBD II Monitor Readiness Status

OBD II systems must indicate whether or not the vehicle's Powertrain Control Module (PCM) 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 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 DTC's 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 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 refer to your vehicle manufacturers workshop manual.

## 2. General information cont.

### 2.6 OBD II Definitions

#### Powertrain Control Module (PCM)

OBDII terminology for the on-board computer that controls engine and drivetrain.

#### Malfunction Indicator Light (MIL)

Malfunction Indicator Light (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 fault with one or more of vehicle's systems and may cause emissions to exceed its limitation. If the MIL illuminates with a steady light, it indicates that a fault has been detected and the vehicle should be repaired 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 on-board diagnostic system cannot turn the MIL off until necessary repairs are completed or the condition no longer exists.

#### Diagnostic Trouble Codes (DTC)

Diagnostic Trouble Codes that identify which section of the emission control system has malfunctioned.

#### Enabling Criteria

Also called 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 on-board diagnostics. Some form of a drive cycle needs to be performed after DTC's 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, refer to your vehicle manufacturers workshop manual.

#### Freeze Frame Data

When an emission 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.

### 2.7 OBD II Modes of Operation

#### Basic introduction to the OBD II communication protocol

Mode byte the first byte in the stream is the mode number. There are 9 modes for diagnostic request, the first byte is from 1 to 9. The first byte in the response data bytes is this same number plus 64.

For example, a mode 1 request would have the first data byte = 1 and the response would have the first data byte = 65

#### Descriptions of the modes:

<b>Mode \$01</b>	Identifies the Powertrain information and shows current data available to the scan tool. This data includes: DTC's set, status of on-board tests and vehicle data such as engine RPM, temperatures, ignition advance, speed, air flow rates, and closed loop status for fuel system.
<b>Mode \$02</b>	Displays Freeze Frame data. Same data as in mode 1, but it was captured and stored when a malfunction occurred and a DTC was set. Some of the on-board diagnostics parameter IDs (PIDs) for mode one are not implemented in this mode.
<b>Mode \$03</b>	Displays the type of powertrain or emission related DTCs stored by a 5 digit code identifying the faults. There may be more than one response message if there are more trouble codes than will fit in the data bytes of the response message or if there are more than one ECU computer responding.
<b>Mode \$04</b>	Used to clear DTCs and freeze frame data. This clears all diagnostic trouble codes that may be set including freeze frame data and readiness monitors.
<b>Mode \$05</b>	Oxygen Sensor Test Results. This mode displays the oxygen sensor monitor screen and the test results gathered by the oxygen sensor.
<b>Available O2 sensor tests</b> \$01 Rich-to-Lean O2 sensor threshold voltage \$02 Lean-to-Rich O2 sensor threshold voltage \$03 Low sensor voltage threshold for switch time measurement \$04 High sensor voltage threshold for switch time measurement \$05 Rich-to-Lean switch time in ms \$06 Lean-to Rich switch time in ms \$07 Minimum voltage for test \$08 Maximum voltage for test \$09 Time between voltage transitions in ms	
<b>Mode \$06</b>	Non-continuously monitored systems test results. There are typically a minimum value, a maximum value, and a current value for each non-continuous monitor. This data is optional, and it is defined by a given vehicle make if it's used
<b>Mode \$07</b>	Request for DTCs (pending) from continuously monitored systems after a single driving cycle has been performed to determine if repair has fixed a problem. This is used by service technicians to verify repair was performed properly and after clearing diagnostic trouble codes.
<b>Mode \$08</b>	This special control mode requests control of the on-board system to test or component bi-directionally (where applicable). This mode is manufacturer specific.
<b>Mode \$09</b>	Reports vehicle information. This information includes vehicle VIN number and calibration information stored in the vehicle ECU's.
<b>Mode \$10</b>	Requests emission related diagnostic trouble codes with permanent status. This mode is required for all emissions related DTC's. The presence of permanent DTC's at an inspection without the MIL illuminated is an indication that a proper repair was not verified by the on-board monitoring system.

# 3. Using the scan tool

## 3.1 Scan tool description



- 1 **OBD II CONNECTOR** - Connects the scan tool to the vehicle's Data Link Connector (DLC)
- 2 **LCD DISPLAY** - Indicates test results
- 3 **GREEN LED** - Indicates that engine systems are running normally
- 4 **YELLOW LED** - Indicates there is a possible fault. A "Pending" DTC is present and/or some of the vehicle's emission monitors have not run their diagnostic testing
- 5 **RED LED** - Indicates there is a fault in one or more of the vehicle's systems. The red LED is also used to show that DTCs are present
- 6 **Fn (one-click function) key** - Shortcut for 4 quick function including I/M readiness status, read code, usual Datastream and all Datastream
- 7 **ENTER/EXIT KEY** - Confirms a selection (or action) from a menu or return to previous menu
- 8 **SCROLL KEY** - Scrolls through menu items

## 3.2 Specifications

Screen	2.0" TFT colour display (220 x 176 dpi)
External Power	8.0 to 16.0 volts, provided via vehicle battery
Operating temperature	0 to 60 °C (32 to 140 °F)
Storage temperature	-20 to 70 °C (-4 to 158 °F)
Dimensions (mm)	Length 124 x Width:72 x Height 18
GW	0.21kg

## 3.3 Navigation Characters

### Characters used to help navigate the scan tool

- # - Identifies the control module number from which data is retrieved
- Pd - Identifies a pending DTC when viewing DTC's

## 3.4 Keypad

Use only a mild non-abrasive detergent and a soft cotton cloth when cleaning keypad and screen. Do not use solvents such as alcohol or automotive degreasers. Do not soak the keypad

## 3.5 Power supply

The power source from the vehicle will supply the scan tool via the data link connector

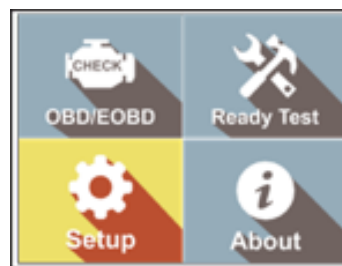
## 3.6 Tool Setup

The scan tool allows you to make the following personalised settings

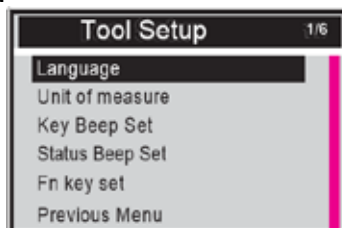
- 1 **Language** - Select the preferred language
- 2 **Unit of measure** - Set the unit of measure to Metric or Imperial
- 3 **Key Beep Set** - Turns on/off key-press beep
- 4 **Status Beep Set** - Turns on/off the I/M Readiness Status beep
- 5 **Fn Key Set** - Set the One-Click-Quick Function Key including usual Datastream, All Datastream, I/M readiness status and read code

### Main Menu

When the scan tool is turned on, it will display the main screen



### Tool Setup Menu

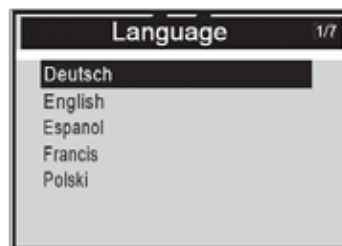


#### 1 Language

**NOTE:** Language is set in English by default

From the Tool Setup menu scroll through and highlight Language and press the 'ENTER' key

Scroll down the Language menu and highlight the preferred language. Press the 'ENTER' key to save your selection and return to the previous screen

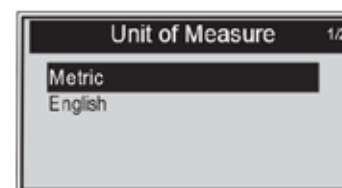


#### 2 Unit of Measure

**NOTE:** Unit of measure is set to Metric by default

From the Tool Setup menu scroll through and highlight Unit of Measure and press the 'ENTER' key

Highlight to select Metric or English as preferred unit. Press the 'ENTER' key to save your selection and return to the previous screen



## 3. Using the scan tool cont.

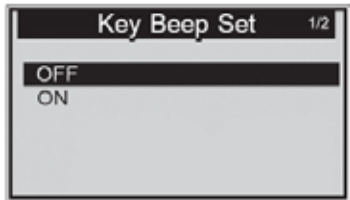
### 3 Key Beep Set

**NOTE:** Key beep set is set to ON by default

From the Tool Setup menu scroll through and highlight Key Beep Set and press the 'ENTER' key

Highlight to select Beep ON or Beep OFF to turn on/off the beep

Press the 'ENTER' key to save your selection and return to the previous screen

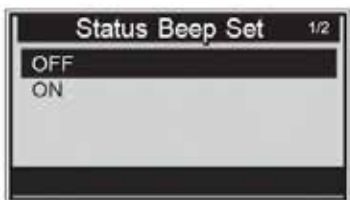


### 4 Status Beep Set

This function allows you to turn on/off the build-in speaker for the LED's in diagnostic testing. Different audio tone corresponds to different LED lights. From the Tool Setup menu scroll through and highlight Status Beep Set and press the 'ENTER' key

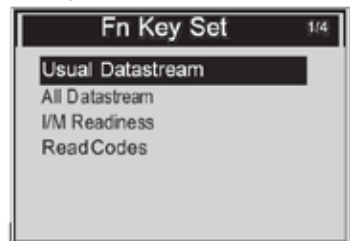
Highlight to select Beep ON or Beep OFF to turn on/off the beep

Press the 'ENTER' key to save your selection and return to the previous screen



### 5 Fn Key Set

From the Tool Setup menu scroll through and highlight FN Key Set and press the 'ENTER' key



This menu will allow you to configure the 'Fn' key setting for one-click function

Scroll through the options and highlight the selected command  
Press the 'ENTER' key to save your selection and return to the previous screen

### Usual Datastream Mode

Once the vehicle's monitors run and complete their diagnosis and testing, the scan tool will recommend relevant Datastream as important data for the user as reference.

### All Datastream Mode

Once the vehicle's monitors run and completed their diagnosis and testing. The scan tool will check all data stream and return to the monitor's status screen

### I/M Readiness Mode

This Mode is the default work mode. Once the vehicle's monitors have run and completed their diagnosis and testing, the scan tool will be ready to use for OBDII diagnostic procedures

### Read Codes Mode

Read Codes Mode is the basic work mode. Once the vehicle's monitors have run and completed their diagnosis and testing, the scan tool will read the trouble codes

### To exit the Setup menu

Scroll and highlight to the 'Previous Menu' line and press the 'ENTER' key and return to the main screen

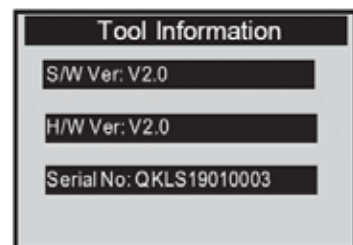
## 3.7 About

This menu will allow you to view the serial number and software version on the scanner

From the Main Menu scroll through and highlight About and press the 'ENTER' key



The Tool Information screen will appear



Press the 'ENTER/Exit' key to return to the main menu

## 3.8 Vehicle Coverage

The scan tool OBD II/EOBD scanner is specially designed to work with all OBD II compliant vehicles, including those equipped with Control Area Network (CAN) system. A small number of 1994 and 1995 model year petrol engine vehicles are OBD II compliant. To verify check the Vehicle Emissions Control Information Label (VECI) which may be located in the engine bay, underside of the bonnet or by the radiator support panel on most vehicles. If the vehicle is OBD II compliant the label will indicate "OBDII Certified". All OBD II compliant vehicles must have a "common" sixteen-pin Data Link Connector (DLC) located inside the vehicle under the dash board.

# 4. OBD II Diagnostics

When more than one vehicle control module is detected by the scan tool, you will be prompted to select the module where the result would be retrieved from. The most common modules are the Power train Control Module (PCM) and Transmission Control Module (TCM)

**CAUTION:** Do not connect or disconnect any test equipment with ignition ON or engine running

## How to connect to vehicle

- 1 Switch the ignition 'OFF'
  - 2 Locate the vehicle's Data link Connector (DLC) plug
  - 3 Securely plug the OBD II cable into the vehicle
  - 4 Switch the ignition 'ON' (Engine can be 'OFF' or 'RUNNING')
- NOTE:** It is recommended to have the engine 'OFF' while scanning. This avoids the engine from getting too hot for further diagnosis and testing and also reduce the build up of exhaust fumes if working in a confined area.
- 5 Scroll through and select Diagnostics in the main screen and press the 'Enter' key

A sequence of messages displaying the OBDII protocols will be observed on the display until the vehicle protocol is detected

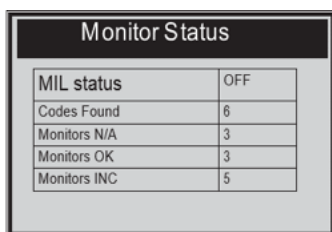
If the scan tool fails to communicate with the vehicle's ECU more than three times, a "LINKING ERROR!" message will be displayed

In this event, verify that the ignition is switched ON

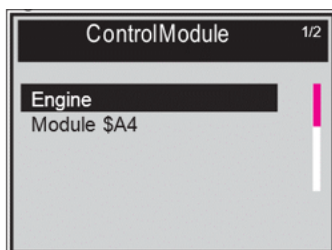
Check if the scan tool's OBD II connector is securely connected to the vehicles DLC



- 6 Wait a few seconds to view a summary of the system status (MIL status, DTC counts, Monitor status)



- 7 If more than one module is detected, you can select the module to be tested  
Scroll through and highlight the module and press the 'Enter' key

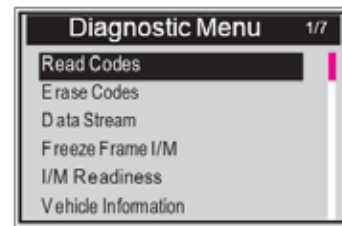


## 4.1 Read Codes

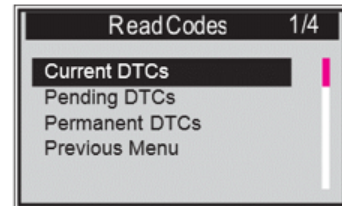
Stored codes will display as 'hard codes' or 'permanent codes'. These codes will cause the control module to illuminate the vehicles Malfunction Indicator Light (MIL) when emission related faults occur

Pending codes will display as 'maturing codes' or 'continues monitor codes'. They indicate faults that the control module has detected during the current or last driving cycle but are not considered serious. Pending Codes will illuminate the Malfunction Indicator Lamp (MIL). If the fault does not occur within a certain number of warm-up cycles, the code clears from memory.

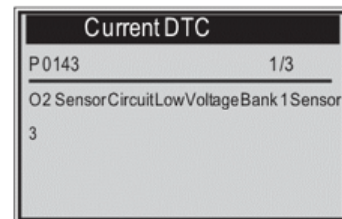
1. Highlight 'Read Codes' and press the 'Enter' key in the Diagnostic Menu. If there are some codes, the screen will display the codes as shown below:



2. Scroll through to select Current DTCs or Pending DTCs from the read codes menu and press the 'Enter' key



3. View DTC and their definitions on screen. Press the 'ENTER' key to return to previous screen



If there are no DTCs it will display "No (pending) codes are stored in the module!" Wait a few seconds or press the 'ENTER' key to return to the previous menu

**NOTE:** Permanent Codes function is available for merely vehicles supporting the CAN protocols

The control module number, sequence of the DTCs total number of codes detected and type of codes (Generic or Manufacturer specific, Stored or Pending codes) will be observed on the upper right hand corner of the display

4. If more than one DTC is found, scroll through to view all other codes
5. Select previous menu from the read codes screen and press the 'Enter' key to return to previous menu

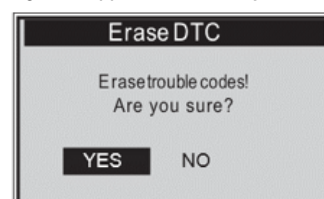
## 4.2 Erase Codes

**CAUTION:** Erasing the Diagnostic Trouble Codes (DTC) may not only erase the codes from the vehicle's ECU, but also the "Freeze Frame" data and manufacturer specific enhanced data. Also the I/M Readiness Monitor Status for all vehicle monitors is reset to Not Ready or Not Complete status. Do not erase the codes before the fault has been inspected or repaired.

**NOTE:** Erasing codes does not ensure that the DTC in ECU have been eliminated completely. As long as there is a fault with the vehicle, the DTC will keep appearing.

This function is to be performed with the ignition 'ON' and the engine 'OFF'. Do not start the engine.

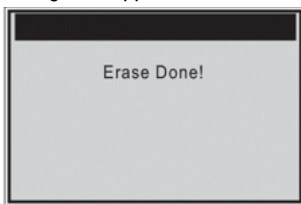
1. Scroll through to highlight 'Erase Codes' and press the 'Enter' key
2. A warning message will appear to confirm your action



**NOTE:** If 'NO' is selected. A message of 'Command Cancelled!' will be displayed. Wait for a few seconds and press any key to return to menu

# 4. OBD II Diagnostics cont.

- Press the 'Enter' key to confirm  
A confirmation message will appear as 'Erase Done!'



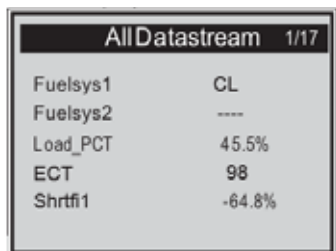
If erasing codes is unsuccessful a message 'Erase Failure Turn Key on with Engine Off!' will appear



## 4.3 Data Stream

The View Data function allows real time view of the on-board diagnostics Parameter IDs (PID) data of vehicle's computer module(s)  
Depending on how many ECUs and sensors the vehicle is fitted with, it will display more than one live data if available

- Scroll through and highlight 'Data Stream' from the diagnostics menu and press the 'Enter' key  
If no freeze frame data is available a message "No Data Stream!" will appear

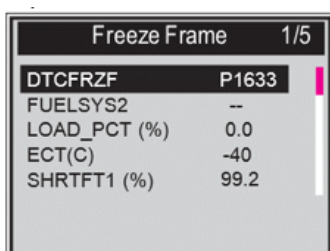


- Wait a few seconds while the scan tool validates the PID MAP
- Once it has finished retrieving information, scroll through to view available data
- Press the 'Enter' key to return to previous menu

## 4.4 View Freeze Frame Data

The Freeze Frame Data allows you to view the vehicle's operating parameters at the moment a DTC is detected. For example, the parameters may include engine speed (RPM), engine coolant temperature (ECT), or vehicle speed sensor (VSS) etc. This information will assist you by allowing the parameters to be duplicated for diagnostic and repair purposes.

- Select 'View Freeze Frame' from the diagnostic menu and press the 'Enter' key
- Wait until the scan tool validates the PID MAP
- Once it has finished retrieving information, scroll through to view available data



A message will appear 'No Freeze Frame Data Stored!' if no freeze frame data is available

- Press the 'Enter' key to return to previous menu

## 4.5 I/M Readiness

I/M Readiness function is used to self test the operation of the vehicles emission control system

CAUTION: Erasing the trouble codes also clears the readiness status for the individual emission system readiness tests. In order to reset these monitors, the vehicle must be driven through a complete drive cycle with no trouble codes stored in the memory. Times for reset vary depending on vehicle.

Some later model vehicles may support two types of I/M Readiness tests:

- Since DTCs Cleared - Indicates status of the monitors since the DTCs are erased
- This Drive Cycle - Indicates status of monitors since the beginning of the current drive cycle

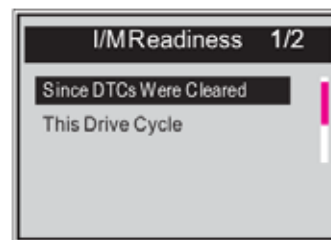
An I/M readiness status result of "NO" does not necessarily indicate that the vehicle being tested will fail. One or more monitors with the status "Not Ready" will be able to pass the emissions inspection.

**OK** - Indicates that a particular monitor being checked has completed its diagnostic testing

**INC** - Indicates that a particular monitor being checked has not completed its diagnostic testing

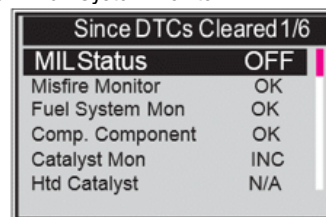
**N/A** - The monitor is not supported on that vehicle

- Scroll through and highlight the I/M Readiness from diagnostic menu and press 'Enter' key
- Wait until the scan tool validates the PID MAP
- If the vehicle supports both types of tests, both options will be available to select

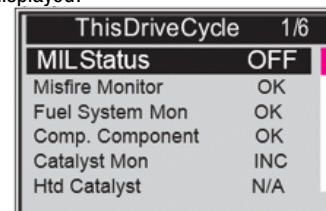


- Scroll through to view the status of the MIL light ("ON" or "OFF") and the following monitors:

- Misfire monitor - Misfire monitor
- Fuel System Mon - Fuel System Monitor
- Comp. Component - Comprehensive Components Monitor
- Catalyst Mon - Catalyst Monitor
- Htd Catalyst - Heated Catalyst Monitor
- EVAP System Mon - Evaporative System Monitor
- Sec Air System - Secondary Air Monitor
- A/C Refrig Mon - A/C system Monitor
- Oxygen Sens Mon - O2 Sensors Monitor
- Oxygen Sens Htr - O2 Sensor Heater Monitor
- EGR System Mon - EGR System Monitor



- If the vehicle supports readiness test of "This Drive Cycle" the following screen will be displayed:

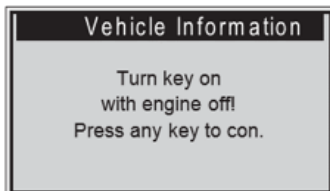


## 4. OBD II Diagnostics cont.

### 4.6 Vehicle Information

The vehicle information feature enables you to retrieve the Vehicle Identification Number (VIN), Calibration ID Number (CIN), Calibration Verification Number (CVN) and In-use Performance Tracking on 2000 and newer vehicles that support Mode 9

- 1 Select vehicle info and press the 'Enter' key  
A message will appear 'Turn key on with engine off! Press any key to con.'

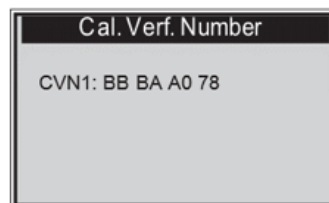


**NOTE:** If the vehicle does not support this mode, a warning message will appear that the mode is not supported

- 2 If it is not supported, scroll through and select an available option and press the 'Enter' key



- 3 View retrieved vehicle information



### 4.7 Exiting the OBDII Test

- 1 Scroll through and highlight 'Previous Menu' and press the 'Enter' key to exit
- 2 A confirmation message will appear. Press the 'Enter' key to exit.

## 5. I/M Readiness

There are two modes to show I/M readiness monitor status. You can configure work modes in the Setup menu.

### 5.1 Ready Test Mode

Scan Tool Mode is the default work mode. After the vehicle's monitors have run and completed their diagnosis and testing, the scan tool will turn to OBDII diagnostic procedures.

**NOTE:** Only in this mode can you perform the OBDII diagnostics

The green, yellow and red LEDs provide a quick way to help you determine if a vehicle is ready for an Emission Test.

The LED and audio tone indications are as interpreted below:

#### LED Interpretation

- 1 GREEN LED - Indicates that engine systems are "OK" and operating normally  
The number of monitors supported by the vehicle which have run and performed their self-diagnostic testing is in the allowed limit. The MIL is off and there are no stored and pending DTCs. The vehicle is ready for an Emissions Test.
- 2 YELLOW LED - Indicates there are three or more possible conditions to cause the yellow LED to illuminate and with the MIL light off  
If the yellow light is illuminated, there is possibly a "Stored" or "Pending" Diagnostic Trouble Code that has been detected
- 3 RED LED - Indicates there is a problem with one or more of the vehicle's system.  
A vehicle displaying a red LED is definitely not ready for an emissions test. The red LED is also an indication that there are DTCs present. The MIL lamp on the vehicle's instrument panel will light steady. The problem that is causing the red LED to light must be repaired before an Emissions Test can be performed. It is also suggested that the vehicle be inspected/ repaired before driving the vehicle further.

### Audio Tone Interpretation

The audio tone could be configured according to the I/M Readiness Status. This function is invaluable when working in bright areas where LED illumination alone is not sufficient.

It is recommended to set the audio tone to Beep ON. For detailed setup information, please refer to Status Beep Set in 3.7 System Setup.

**NOTE:** The following audio tone description only works in Scan Tool mode. Different audio tone with different LED lights will indicate different I/M Readiness Status.

### 5.2 Scan Tool Mode

After the vehicle's monitors have run and completed their diagnosis and testing, the scan tool will return to the previous screen. This mode is only used to check the emission-related monitors' status

**NOTE:** This function reads off the real time data of emission-related monitoring systems readiness status every two minutes. Once the scan tool has finished other operations, for example, clearing trouble codes, and the real time data been changed, the I/M Readiness Status indication will be changed accordingly. In order to reset these monitors, the vehicle must be driven through a complete drive cycle. Times for reset vary depending on vehicle.

Repairs to the emissions control systems of a 1996 or newer vehicle cause the vehicle's computer (ECU) memory to be cleared. The vehicle must go through a drive cycle to allow the ECU to perform a series of tests to ensure that the repair was successful, and before a state mandated emissions test can be conducted.

In the Ready Test Mode it is possible to check the I/M Readiness status to determine whether an OBD II vehicle is ready for an emission test. To enter this mode simply press the One-Click (Fn) Key at any time if the One-Click function key is set to I/M readiness. Or while the scan tool in Ready Test Mode, select Diagnostics in the main screen.

If the scan tool is at idle it will show the result immediately. If it is busy it will wait till the current procedure is finished. After viewing the status press One-Click (Fn) Key or the 'ENTER' key to exit. This will take a few seconds.



## 5. I/M Readiness cont.

### LED Interpretation

In this mode only the GREEN, RED LEDs and audio tone provides an easy way to check if emission-related monitoring systems complete their self-diagnostic testing

1 GREEN LED - Indicates that engine systems are "OK" and operating normally

The number of monitors supported by the vehicle which have run and performed their self-diagnostic testing is in the allowed limit

2 RED LED - Indicates that the number of monitors supported by the vehicle which have run and performed their self-diagnostic testing is out of the allowed limit

### Audio Tone Interpretation

The audio tone could be configured according to the I/M Readiness Status. This function is invaluable when working in bright areas where LED illumination alone is not sufficient.

**OK** - Indicates that a particular monitor being checked has completed its diagnostic testing

**INC** - Indicates that a particular monitor being checked has not completed its diagnostic testing

**N/A** - The monitor is not supported on the vehicle

I/M Readiness 1/6	
MILStatus	OFF
Misfire Monitor	OK
Fuel System Mon	OK
Comp. Component	OK
Catalyst Mon	INC
Htd Catalyst	N/A

### LED and Audio tone correspondence

LED Light	Audio Tone	Beep Interval
Green LED	Beep off	
Yellow LED	Two short beeps	0.5 seconds
Red LED	Two short beeps	0.5 seconds

## 6. Troubleshooting

Problem	Possible cause	Solution
Vehicle linking error	A communication error occurs if the scan tool fails to communicate with the vehicle's ECU (Engine Control Unit)	Ensure ignition is switched on
		Check the scan tools OBD II connector is securely connected to the vehicles DLC
		Switch the ignition off and wait 30 seconds. Switch the ignition back on and continue testing
		Verify the ECU/Control module of the vehicle is not defective
		Check if the DLC pins and terminals for damage. Clean if necessary
Operating Error	Scan tool freezes or slow to respond	Reset the scan tool. Switch the ignition off and wait 30 seconds. Switch the ignition back on and continue testing
		Check if the DLC pins and terminals for damage. Clean if necessary
Scan tool not turning on	No power supply to scan tool	Ensure ignition is switched on
		Vehicle battery voltage at least 8.0 volts
		Verify the control module is not defective
LED indicator not working	Poor connection	Check the scan tools OBD II connector is securely connected to the vehicles DLC
		Ensure ignition is switched on
		Run the LED test in the system setup menu
Diagnostic function inoperative	Mode selection	The scanner maybe in ready test mode. In the system setup menu select 'Scan Tool Mode'