

# CarScan<sup>®</sup> Scan Tool



## OWNER'S MANUAL

RepairSolutions 2

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## SAFETY FIRST!

This manual describes common test procedures used by experienced service technicians. Many test procedures require precautions to avoid accidents that can result in personal injury, and/or damage to your vehicle or test equipment. Always read your vehicle's service manual and follow its safety precautions before and during any test or service procedure. **ALWAYS** observe the following general safety precautions:



When an engine is running, it produces carbon monoxide, a toxic and poisonous gas. To prevent serious injury or death from carbon monoxide poisoning, operate the vehicle **ONLY** in a **well-ventilated** area.



To protect your eyes from propelled objects as well as hot or caustic liquids, **always** wear **approved** safety eye protection.



When an engine is running, many parts (such as the coolant fan, pulleys, fan belt etc.) turn at high speed. To avoid serious injury, always be aware of moving parts. Keep a safe distance from these parts as well as other potentially moving objects.



Engine parts become very hot when the engine is running. To prevent severe burns, avoid contact with hot engine parts.



Before starting an engine for testing or troubleshooting, make sure the parking brake is engaged. Put the transmission in **park** (for automatic transmission) or **neutral** (for manual transmission). Block the drive wheels with suitable blocks.



Connecting or disconnecting test equipment when the ignition is **ON** can damage test equipment and the vehicle's electronic components. Turn the ignition **OFF** before connecting the Scan Tool to or disconnecting the Scan Tool from the vehicle's Data Link Connector (DLC).



To prevent damage to the on-board computer when taking vehicle electrical measurements, always use a digital multimeter with at least 10 megOhms of impedance.

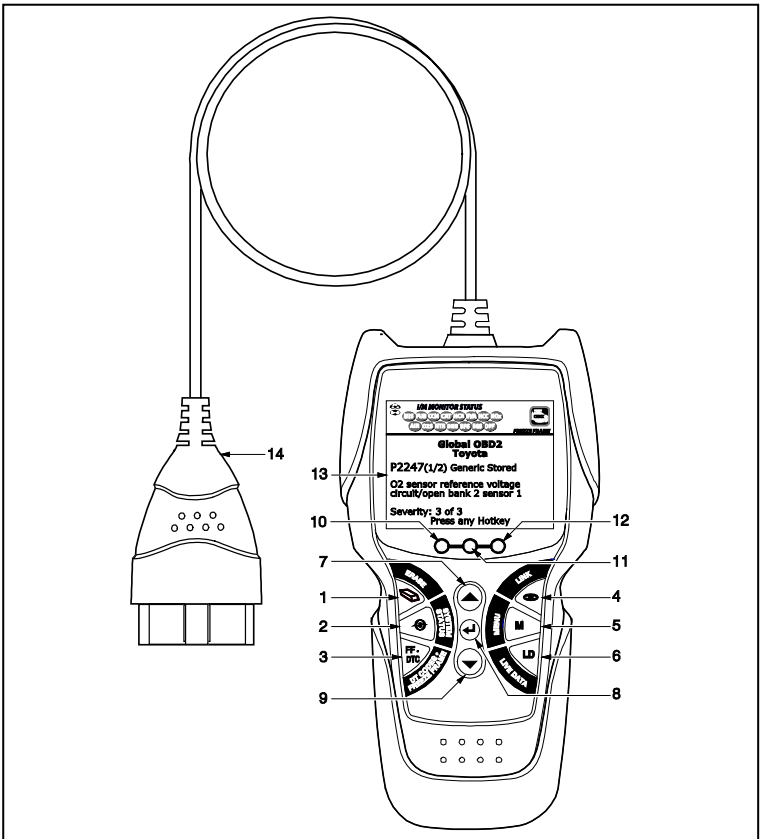


Fuel and battery vapors are highly flammable. To prevent an explosion, keep all sparks, heated items and open flames away from the battery and fuel / fuel vapors. **DO NOT SMOKE NEAR THE VEHICLE DURING TESTING.**



Don't wear loose clothing or jewelry when working on an engine. Loose clothing can become caught in the fan, pulleys, belts, etc. Jewelry is highly conductive, and can cause a severe burn if it makes contact between a power source and ground.

**CONTROLS AND INDICATORS**



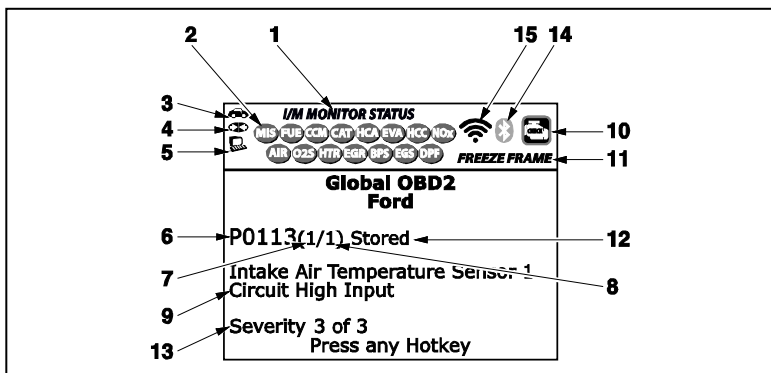
**Figure 1. Controls and Indicators**

See Figure 1 for the locations of items 1 through 14, below.

1. **ERASE button** - Erases Diagnostic Trouble Codes (DTCs), and "Freeze Frame" data from your vehicle's computer, and resets Monitor status.
2. **SYSTEM MENU button** - When pressed, displays the System Test Menu.
3. **DTC/FF button** - Displays the DTC View screen and/or scrolls the LCD display to view DTCs and Freeze Frame data.
4. **LINK button** - When connected to a vehicle, links the Scan Tool to the vehicle's PCM.
5. **M button** - When pressed, displays the Main Menu.




6. **LD button** – When pressed while linked to a vehicle, places the Scan Tool in Live Data mode.
7. **▲ UP button** – When in MENU mode, scrolls UP through the menu options. When LINKED to a vehicle, scrolls UP through the current display screen to display any additional data.
8. **◀ ENTER button** - When in MENU mode, confirms the selected option or value.
9. **▼ DOWN button** - When in MENU mode, scrolls DOWN through the menu options. When LINKED to a vehicle, scrolls DOWN through the current display screen to display any additional data.
10. **GREEN LED** - Indicates that all engine systems are running normally (all Monitors on the vehicle are active and performing their diagnostic testing, and no DTCs are present).
11. **YELLOW LED** - Indicates there is a possible problem. A “Pending” DTC is present and/or some of the vehicle’s emission monitors have not run their diagnostic testing.
12. **RED LED** - Indicates there is a problem in one or more of the vehicle’s systems. The red LED is also used to show that DTC(s) are present. DTCs are shown on the Scan Tool’s display. In this case, the Malfunction Indicator (“Check Engine”) lamp on the vehicle’s instrument panel will light steady on.
13. **Display** - Color LCD display shows menu and submenus, test results, Scan Tool functions and Monitor status information. See **DISPLAY FUNCTIONS** (page 9) for more details.
14. **CABLE** - Connects the Scan Tool to the vehicle’s Data Link Connector (DLC).

## DISPLAY FUNCTIONS



**Figure 2. Display Functions**

See Figure 2 for the locations of items 1 through 15, below.

1. **I/M MONITOR STATUS field** - Identifies the I/M Monitor status area.
2. **Monitor icons** - Indicate which Monitors are supported by the vehicle under test, and whether or not the associated Monitor has run its diagnostic testing (Monitor status). A solid green icon indicates the associated Monitor has completed its diagnostic testing. A flashing red icon indicates that the vehicle supports the associated Monitor, but the Monitor has not yet run its diagnostic testing.
3.  **Vehicle icon** - When visible, indicates that the Scan Tool is being powered through the vehicle's DLC connector.
4.  **Link icon** - When visible, indicates the Scan Tool is communicating with the vehicle's computer.
5.  **Computer icon** - When visible, indicates the Scan Tool is linked to a personal computer.
6. **DTC Display Area** - Displays the Diagnostic Trouble Code (DTC) number. Each fault is assigned a code number that is specific to that fault. The DTC number is color-coded as follows:
  - **RED** - Indicates the currently displayed DTC is a STORED OR PERMANENT DTC.
  - **YELLOW** - Indicates the currently displayed DTC is a PENDING DTC.
  - **GREEN** - In cases where no codes are retrieved, a "No DTCs are presently stored in the vehicle's computer" message is shown in green.
7. **Code Number Sequence** - The Scan Tool assigns a sequence number to each DTC that is present in the computer's memory, starting with "1." This number indicates which code is currently displayed. Code number "1" is always the highest priority code, and the one for which "Freeze Frame" data has been stored.



*If "1" is a "Pending" code, there may or may not be "Freeze Frame" data stored in memory.*

8. **Code Enumerator** - Indicates the total number of codes retrieved from the vehicle's computer.
9. **Test Data Display Area** - Displays DTC definitions, Freeze Frame data and other pertinent test information messages.
10. **SYSTEM icon** - Indicates the system with which the code is associated:



MIL icon





ABS icon





SRS icon

11. **FREEZE FRAME icon** - Indicates that there is Freeze Frame data from "Priority Code" (Code #1) stored in the vehicle's computer memory.
12. **Code type** - Indicates the type of code being displayed; **Generic Stored, Generic Pending, Generic permanent**, etc.
13. **Severity** - Indicates the level of severity for the priority code (code number "1"), as follows:

- 1 - Service should be scheduled and repairs made when convenient. This DTC typically has no immediate threat to essential system components in the short term.
  - 2 - Repair immediately if drivability issues are present. Threat to essential system components if not repaired as soon as possible.
  - 3 - Stop and repair vehicle immediately to prevent interrelated failures. Harmful and damaging to essential system components.
14.  **Bluetooth icon** – Indicates communication status with a compatible Innova mobile application (please visit [www.innova.com/apps](http://www.innova.com/apps) for more information). A solid blue icon indicates an active Bluetooth connection has been established. A solid grey icon indicates Bluetooth is not connected.
15.  **Wi-Fi icon** – Indicates Wi-Fi communication status. When ON, indicates the scan tool is linked to a Wi-Fi network. When OFF, indicates there is no Wi-Fi connection.

## INITIAL ADJUSTMENTS

The first time the unit is connected to a vehicle, you must select the desired display language (English, French or Spanish) and unit of measurement (Standard or metric) as follows:

1. Select the desired display language, then press **ENTER** .
2. Select the desired unit of measurement, then press **ENTER** .



*After the initial language and unit of measurement selections are performed, these, as well as other settings, can be changed as desired. Proceed to “ADJUSTMENTS AND SETTINGS” on page 57 for further instructions.*

## COMPUTER ENGINE CONTROLS

### The Introduction of Electronic Engine Controls

***Electronic Computer Control Systems make it possible for vehicle manufacturers to comply with the tougher emissions and fuel efficiency standards mandated by State and Federal Governments.***

As a result of increased air pollution (smog) in large cities, such as Los Angeles, the California Air Resources Board (**CARB**) and the Environmental Protection Agency (**EPA**) set new regulations and air pollution standards to deal with the problem. To further complicate matters, the energy crisis of the early 1970s caused a sharp increase in fuel prices over a short period. As a result, vehicle manufacturers were not only required to comply with the new emissions standards, they also had to make their vehicles more fuel-efficient. Most vehicles were required to meet a miles-per-gallon (MPG) standard set by the U.S. Federal Government.



Precise fuel delivery and spark timing are needed to reduce vehicle emissions. Mechanical engine controls in use at the time (such as ignition points, mechanical spark advance and the carburetor) responded too slowly to driving conditions to properly control fuel delivery and spark timing. This made it difficult for vehicle manufacturers to meet the new standards.

A new Engine Control System had to be designed and integrated with the engine controls to meet the stricter standards. The new system had to:

- Respond instantly to supply the proper mixture of air and fuel for any driving condition (idle, cruising, low-speed driving, high-speed driving, etc.).
- Calculate instantly the best time to “ignite” the air/fuel mixture for maximum engine efficiency.
- Perform both these tasks without affecting vehicle performance or fuel economy.

Vehicle Computer Control Systems can perform millions of calculations each second. This makes them an ideal substitute for the slower mechanical engine controls. By switching from mechanical to electronic engine controls, vehicle manufacturers are able to control fuel delivery and spark timing more precisely. Some newer Computer Control Systems also provide control over other vehicle functions, such as transmission, brakes, charging, body, and suspension systems.



## The Basic Engine Computer Control System

**The Computer Control System consists of an on-board computer and several related control devices (sensors, switches, and actuators).**

The on-board computer is the heart of the Computer Control System. The computer contains several programs with preset reference values for air/fuel ratio, spark or ignition timing, injector pulse width, engine speed, etc. Separate values are provided for various driving conditions, such as idle, low speed driving, high-speed driving, low load, or high load. The preset reference values represent the ideal air/fuel mixture, spark timing, transmission gear selection, etc., for any driving condition. These values are programmed by the vehicle manufacturer, and are specific to each vehicle model.

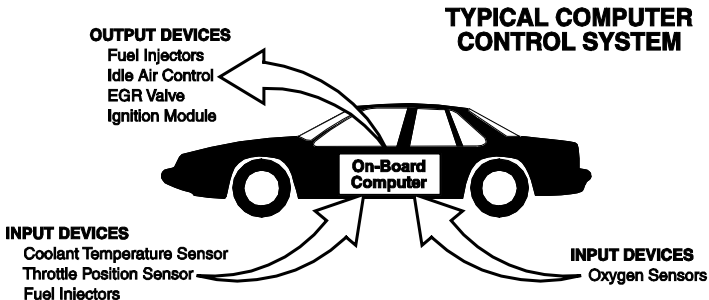


Most on-board computers are located inside the vehicle behind the dashboard, under the passenger's or driver's seat, or behind the right kick panel. However, some manufacturers may still position it in the engine compartment.

Vehicle sensors, switches, and actuators are located throughout the engine, and are connected by electrical wiring to the on-board computer. These devices include oxygen sensors, coolant temperature sensors, throttle position sensors, fuel injectors, etc. Sensors and switches are **input devices**. They provide signals representing current engine operating conditions to the computer. Actuators are **output devices**. They perform actions in response to commands received from the computer.

The on-board computer receives information inputs from sensors and switches located throughout the engine. These devices monitor critical engine conditions such as coolant temperature, engine speed, engine load, throttle position, air/fuel ratio etc.

The computer compares the values received from these sensors with its preset reference values, and makes corrective actions as needed so that the sensor values always match the preset reference values for the current driving condition. The computer makes adjustments by commanding other devices such as the fuel injectors, idle air control, EGR valve or Ignition Module to perform these actions.



Vehicle operating conditions are constantly changing. The computer continuously makes adjustments or corrections (especially to the air/fuel mixture and spark timing) to keep all the engine systems operating within the preset reference values.

### On-Board Diagnostics - First Generation (OBD1)

*With the exception of some 1994 and 1995 vehicles, most vehicles from 1982 to 1995 are equipped with some type of first generation On-Board Diagnostics.*



Beginning in 1988, California's Air Resources Board (**CARB**), and later the Environmental Protection Agency (**EPA**) required vehicle manufacturers to include a self-diagnostic program in their on-board computers. The program would be capable of identifying emissions-related faults in a system. The first generation of Onboard Diagnostics came to be known as **OBD1**.

OBD1 is a set of self-testing and diagnostic instructions programmed into the vehicle's on-board computer. The programs are specifically designed to detect failures in the sensors, actuators, switches and wiring of the various vehicle emissions-related systems. If the computer detects a failure in any of these components or systems, it lights an indicator on the dashboard to alert the driver. The indicator lights **only** when an emissions-related problem is detected.

The computer also assigns a numeric code for each specific problem that it detects, and stores these codes in its memory for later retrieval. These codes can be retrieved from the computer's memory with the use of a "Code Reader" or a "Scan Tool."

### On-Board Diagnostics - Second Generation (OBD2)

In addition to performing all the functions of the OBD1 System, the OBD2 System has been enhanced with new Diagnostic Programs. These programs closely monitor the functions of various emissions-related components and systems (as well as other systems) and make this information readily available (with the proper equipment) to the technician for evaluation.

*The OBD2 System is an enhancement of the OBD1 System.*

The California Air Resources Board (**CARB**) conducted studies on OBD1 equipped vehicles. The information that was gathered from these studies showed the following:

- A large number of vehicles had deteriorating or degraded emissions-related components. These components were causing an increase in emissions.



- Because OBD1 systems only detect failed components, the degraded components were not setting codes.
- Some emissions problems related to degraded components only occur when the vehicle is being driven under a load. The emission checks being conducted at the time were not performed under simulated driving conditions. As a result, a significant number of vehicles with degraded components were passing Emissions Tests.
- Codes, code definitions, diagnostic connectors, communication protocols and emissions terminology were different for each manufacturer. This caused confusion for the technicians working on different make and model vehicles.

To address the problems made evident by this study, CARB and the EPA passed new laws and standardization requirements. These laws required that vehicle manufacturers to equip their new vehicles with devices capable of meeting all of the new emissions standards and regulations. It was also decided that an enhanced on-board diagnostic system, capable of addressing all of these problems, was needed. This new system is known as **"On-Board Diagnostics Generation Two (OBD2)."** The primary objective of the OBD2 system is to comply with the latest regulations and emissions standards established by CARB and the EPA.

The Main Objectives of the OBD2 System are:

- To detect degraded and/or failed emissions-related components or systems that could cause tailpipe emissions to exceed by 1.5 times the Federal Test Procedure (FTP) standard.
- To expand emissions-related system monitoring. This includes a set of computer run diagnostics called Monitors. Monitors perform diagnostics and testing to verify that all emissions-related components and/or systems are operating correctly and within the manufacturer's specifications.
- To use a standardized Diagnostic Link Connector (DLC) in all vehicles. (Before OBD2, DLCs were of different shapes and sizes.)
- To standardize the code numbers, code definitions and language used to describe faults. (Before OBD2, each vehicle manufacturer used their own code numbers, code definitions and language to describe the same faults.)
- To expand the operation of the Malfunction Indicator Lamp (MIL).
- To standardize communication procedures and protocols between the diagnostic equipment (Scan Tools, Code Readers, etc.) and the vehicle's on-board computer.

## **OBD2 Terminology**

The following terms and their definitions are related to OBD2 systems. Read and reference this list as needed to aid in the understanding of OBD2 systems.

- **Powertrain Control Module (PCM)** - The PCM is the OBD2 accepted term for the vehicle's "on-board computer." In addition to controlling the engine management and emissions systems, the PCM also participates in controlling the powertrain (transmission) operation. Most PCMs also have the ability to communicate with other computers on the vehicle (ABS, ride control, body, etc.).
- **Monitor** - Monitors are "diagnostic routines" programmed into the PCM. The PCM utilizes these programs to run diagnostic tests, and to monitor operation of the vehicle's emissions-related components or systems to ensure they are operating correctly and within the vehicle's manufacturer specifications. Currently, up to fifteen Monitors are used in OBD2 systems. Additional Monitors will be added as the OBD2 system is further developed.



*Not all vehicles support all fifteen Monitors.*

- **Enabling Criteria** - Each Monitor is designed to test and monitor the operation of a specific part of the vehicle's emissions system (EGR system, oxygen sensor, catalytic converter, etc.). A specific set of "conditions" or "driving procedures" must be met before the computer can command a Monitor to run tests on its related system. These "conditions" are known as "**Enabling Criteria.**" The requirements and procedures vary for each Monitor. Some Monitors only require the ignition key to be turned "**On**" for them to run and complete their diagnostic testing. Others may require a set of complex procedures, such as, starting the vehicle when cold, bringing it to operating temperature, and driving the vehicle under specific conditions before the Monitor can run and complete its diagnostic testing.
- **Monitor Has/Has Not Run** - The terms "Monitor has run" or "Monitor has not run" are used throughout this manual. "**Monitor has run,**" means the PCM **has** commanded a particular Monitor to perform the required diagnostic testing on a system to ensure the system is operating correctly (within factory specifications). The term "**Monitor has not run**" means the PCM **has not** yet commanded a particular Monitor to perform diagnostic testing on its associated part of the emissions system.
- **Trip** - A Trip for a particular Monitor requires that the vehicle is being driven in such a way that all the required "Enabling Criteria" for the Monitor to run and complete its diagnostic testing are met. The "Trip Drive Cycle" for a particular Monitor begins when the ignition key is turned "**On.**" It is successfully completed when all the "Enabling Criteria" for the Monitor to run and complete its diagnostic testing are met by the time the ignition key is turned "**Off.**" Since each of the fifteen monitors is designed to run diagnostics and testing on a different part of the engine or emissions system, the "Trip Drive Cycle" needed for each individual Monitor to run and complete varies.

- **OBD2 Drive Cycle** - An OBD2 Drive Cycle is an extended set of driving procedures that takes into consideration the various types of driving conditions encountered in real life. These conditions may include starting the vehicle when it is cold, driving the vehicle at a steady speed (cruising), accelerating, etc. An OBD2 Drive Cycle begins when the ignition key is turned "On" (when cold) and ends when the vehicle has been driven in such a way as to have all the "Enabling Criteria" met for all its applicable Monitors. Only those trips that provide the Enabling Criteria for all Monitors applicable to the vehicle to run and complete their individual diagnostic tests qualify as an OBD2 Drive Cycle. OBD2 Drive Cycle requirements vary from one model of vehicle to another. Vehicle manufacturers set these procedures. Consult your vehicle's service manual for OBD2 Drive Cycle procedures.



*Do not confuse a "Trip" Drive Cycle with an OBD2 Drive Cycle. A "Trip" Drive Cycle provides the "Enabling Criteria" for one specific Monitor to run and complete its diagnostic testing. An OBD2 Drive Cycle must meet the "Enabling Criteria" for all Monitors on a particular vehicle to run and complete their diagnostic testing.*

- **Warm-up Cycle** - Vehicle operation after an engine off period where engine temperature rises at least 40°F (22°C) from its temperature before starting, and reaches at least 160°F (70°C). The PCM uses warm-up cycles as a counter to automatically erase a specific code and related data from its memory. When no faults related to the original problem are detected within a specified number of warm-up cycles, the code is erased automatically.

## DIAGNOSTIC TROUBLE CODES (DTCs)

Diagnostic Trouble Codes (DTCs) are meant to guide you to the proper service procedure in the vehicle's service manual. **DO NOT** replace parts based only on DTCs without first consulting the vehicle's service manual for proper testing procedures for that particular system, circuit or component.

DTCs are alphanumeric codes that are used to identify a problem that is present in any of the systems that are monitored by the on-board computer (PCM). Each trouble code has an assigned message that identifies the circuit, component or system area where the problem was found.

OBD2 diagnostic trouble codes are made up of five characters:

- The 1st character is a **letter** (B, C, P or U). It identifies the "main system" where the fault occurred (Body, Chassis, Powertrain, or Network).
- The 2nd character is a **numeric digit** (0 thru 3). It identifies the "type" of code (Generic or Manufacturer-Specific).



**Generic DTCs** are codes that are used by all vehicle manufacturers. The standards for generic DTCs, as well as their definitions, are set by the Society of Automotive Engineers (SAE).

**Diagnostic Trouble Codes (DTCs) are codes that identify a specific problem area.**

A silhouette of a person standing and pointing towards a speech bubble that contains the text above.

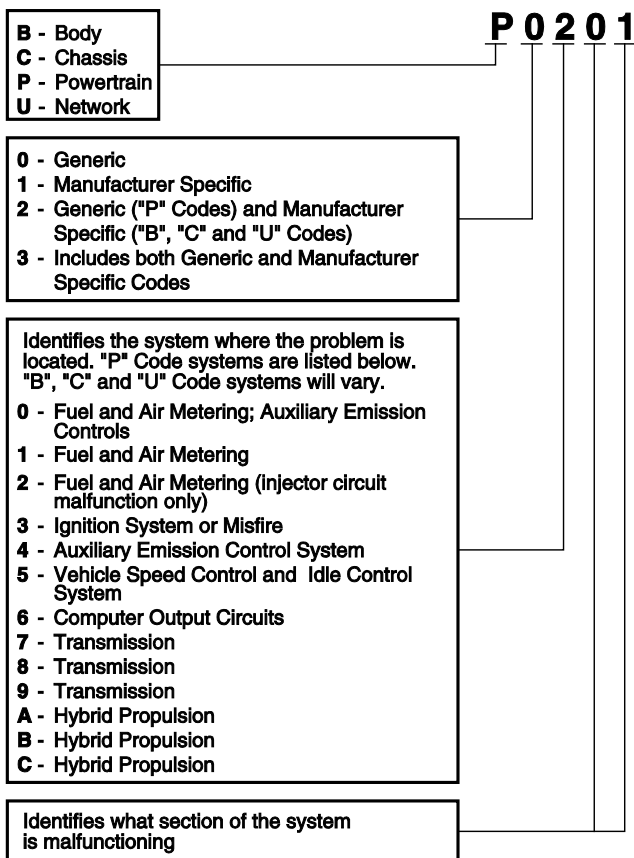


**Manufacturer-Specific DTCs** are codes that are controlled by the vehicle manufacturers. The Federal Government does not require vehicle manufacturers to go beyond the standardized generic DTCs in order to comply with the new OBD2 emissions standards. However, manufacturers are free to expand beyond the standardized codes to make their systems easier to diagnose.

- The 3rd character is a **letter** or a **numeric digit** (0 thru 9, A thru F). It identifies the specific system or sub-system where the problem is located.
- The 4th and 5th characters are **letters** or **numeric digits** (0 thru 9, A thru F). They identify the section of the system that is malfunctioning.

### OBD2 DTC EXAMPLE

P0201 - Injector Circuit Malfunction, Cylinder 1



### DTCs and MIL Status

When the vehicle's on-board computer detects a failure in an emissions-related component or system, the computer's internal diagnostic program assigns a diagnostic trouble code (DTC) that points to the system (and subsystem) where the fault was found. The diagnostic program saves the code in the computer's memory. It records a "Freeze Frame" of conditions present when the fault was found, and lights the Malfunction Indicator Lamp (MIL). Some faults require detection for two trips in a row before the MIL is turned on.



*The "Malfunction Indicator Lamp" (MIL) is the accepted term used to describe the lamp on the dashboard that lights to warn the driver that an emissions-related fault has been found. Some manufacturers may still call this lamp a "Check Engine" or "Service Engine Soon" light.*

There are two types of DTCs used for emissions-related faults: Type "A" and Type "B." Type "A" codes are "One-Trip" codes; Type "B" DTCs are usually Two-Trip DTCs.

When a **Type "A"** DTC is found on the First Trip, the following events take place:

- The computer commands the MIL "On" when the failure is first found.
- If the failure causes a severe misfire that may cause damage to the catalytic converter, the MIL "flashes" **once per second**. The MIL continues to flash as long as the condition exists. If the condition that caused the MIL to flash is no longer present, the MIL will light "steady" On.
- A DTC is saved in the computer's memory for later retrieval.
- A "Freeze Frame" of the conditions present in the engine or emissions system when the MIL was ordered "On" is saved in the computer's memory for later retrieval. This information shows fuel system status (closed loop or open loop), engine load, coolant temperature, fuel trim value, MAP vacuum, engine RPM and DTC priority.

When a **Type "B"** DTC is found on the First Trip, the following events take place:

- The computer sets a Pending DTC, but the MIL is not ordered "On." "Freeze Frame" data may or may not be saved at this time depending on manufacturer. The Pending DTC is saved in the computer's memory for later retrieval.
- If the failure **is found** on the second consecutive trip, the MIL is ordered "On." "Freeze Frame" data is saved in the computer's memory.
- If the failure **is not found** on the second Trip, the Pending DTC is erased from the computer's memory.

The MIL will stay lit for both Type "A" and Type "B" codes until one of the following conditions occurs:

- If the conditions that caused the MIL to light are no longer present for the next three trips in a row, the computer automatically turns the MIL "Off" if no other emissions-related faults are present. However, the DTCs remain in the computer's memory as a history code for 40 warm-up cycles (80 warm-up cycles for fuel and misfire faults). The DTCs are automatically erased if the fault that caused them to be set is not detected again during that period.
- Misfire and fuel system faults require three trips with "similar conditions" before the MIL is turned "Off." These are trips where the engine load, RPM and temperature are similar to the conditions present when the fault was first found.



*After the MIL has been turned off, DTCs and Freeze Frame data stay in the computer's memory.*

- Erasing the DTCs from the computer's memory can also turn off the MIL. See ERASING DIAGNOSTIC TROUBLE CODES (DTCs) on page 33, before erasing codes from the computer's memory. If a Diagnostic Tool or Scan Tool is used to erase the codes, Freeze Frame data will also be erased.

## OBD2 MONITORS

To ensure the correct operation of the various emissions-related components and systems, a diagnostic program was developed and installed in the vehicle's on-board computer. The program has several procedures and diagnostic strategies. Each procedure or diagnostic strategy is made to monitor the operation of, and run diagnostic tests on, a specific emissions-related component or system. These tests ensure the system is running correctly and is within the manufacturer's specifications. On OBD2 systems, these procedures and diagnostic strategies are called "Monitors."

Currently, fifteen Monitors are supported by OBD2 systems. Additional monitors may be added as a result of Government regulations as the OBD2 system grows and matures. Not all vehicles support all fifteen Monitors. Additionally, some Monitors are supported by "spark ignition" vehicles only, while others are supported by "compression ignition" vehicles only.

Monitor operation is either "**Continuous**" or "**Non-Continuous**," depending on the specific monitor.

### Continuous Monitors

Three of these Monitors are designed to constantly monitor their associated components and/or systems for proper operation. Continuous Monitors run constantly when the engine is running. The Continuous Monitors are:

 Comprehensive Component Monitor (CCM)








 Misfire Monitor

 Fuel System Monitor








## Non-Continuous Monitors

The other twelve Monitors are “non-continuous” Monitors. “Non-continuous” Monitors perform and complete their testing once per trip. The “non-continuous” Monitors are:

-  Oxygen Sensor Monitor
-  Oxygen Sensor Heater Monitor
-  Catalyst Monitor
-  Heated Catalyst Monitor
-  EGR System Monitor
-  EVAP System Monitor
-  Secondary Air System Monitor



*The following Monitors became standard beginning in 2010. The majority of vehicles produced before this time will not support these Monitors*

-  NMHC Monitor
-  NOx Adsorber Monitor
-  Boost Pressure System Monitor
-  Exhaust Gas Sensor Monitor
-  PM Filter Monitor

The following provides a brief explanation of the function of each Monitor:



**Comprehensive Component Monitor (CCM)** - This Monitor continuously checks all inputs and outputs from sensors, actuators, switches and other devices that provide a signal to the computer. The Monitor checks for shorts, opens, out of range value, functionality and “rationality.”



**Rationality:** Each input signal is compared against all other inputs and against information in the computer’s memory to see if it makes sense under the current operating conditions. Example: The signal from the throttle position sensor indicates the vehicle is in a wide-open throttle condition, but the vehicle is really at idle, and the idle condition is confirmed by the signals from all other sensors. Based on the input data, the computer determines that the signal from the throttle position sensor is not rational (does not make sense when compared to the other inputs). In this case, the signal would fail the rationality test.

The CCM is supported by both “spark ignition” vehicles and “compression ignition” vehicles. The CCM may be either a “One-Trip” or a “Two-Trip” Monitor, depending on the component.



**Fuel System Monitor** - This Monitor uses a Fuel System Correction program, called Fuel Trim, inside the on-board computer. Fuel Trim is a set of positive and negative values that represent adding or subtracting fuel from the engine. This program is used to correct for a lean (too much air/not enough fuel) or rich (too much fuel/not enough air) air-fuel mixture. The program is designed to add or subtract fuel, as needed, up to a certain percent. If the correction needed is too large and exceeds the time and percent allowed by the program, a fault is indicated by the computer.

The Fuel System Monitor is supported by both "spark ignition" vehicles and "compression ignition" vehicles. The Fuel System Monitor may be a "One-Trip" or "Two-Trip" Monitor, depending on the severity of the problem.



**Misfire Monitor** - This Monitor continuously checks for engine misfires. A misfire occurs when the air-fuel mixture in the cylinder does not ignite. The misfire Monitor uses changes in crankshaft speed to sense an engine misfire. When a cylinder misfires, it no longer contributes to the speed of the engine, and engine speed decreases each time the affected cylinder(s) misfire. The misfire Monitor is designed to sense engine speed fluctuations and determine from which cylinder(s) the misfire is coming, as well as how bad the misfire is. There are three types of engine misfires, Types 1, 2, and 3.

- Type 1 and Type 3 misfires are two-trip monitor faults. If a fault is sensed on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The MIL is not commanded on at this time. If the fault is found again on the second trip, under similar conditions of engine speed, load and temperature, the computer commands the MIL "On," and the code is saved in its long term memory.
- Type 2 misfires are the most severe type of misfire. When a Type 2 misfire is sensed on the first trip, the computer commands the MIL to light when the misfire is sensed. If the computer determines that a Type 2 misfire is severe, and may cause catalytic converter damage, it commands the MIL to "flash" once per second as soon as the misfire is sensed. When the misfire is no longer present, the MIL reverts to steady "On" condition.

The Misfire Monitor is supported by both "spark ignition" vehicles and "compression ignition" vehicles.



**Catalyst Monitor** - The catalytic converter is a device that is installed downstream of the exhaust manifold. It helps to oxidize (burn) the unburned fuel (hydrocarbons) and partially burned fuel (carbon monoxide) left over from the combustion process. To accomplish this, heat and catalyst materials inside the converter react with the exhaust gases to burn the remaining fuel. Some materials inside the catalytic converter also have the ability to store oxygen, and release it as needed to oxidize hydrocarbons and carbon monoxide. In the process, it reduces vehicle emissions by converting the polluting gases into carbon dioxide and water.

The computer checks the efficiency of the catalytic converter by monitoring the oxygen sensors used by the system. One sensor is located before (upstream of) the converter; the other is located after (downstream of) the converter. If the catalytic converter loses its ability to store oxygen,

the downstream sensor signal voltage becomes almost the same as the upstream sensor signal. In this case, the monitor fails the test.

The Catalyst Monitor is supported by “spark ignition” vehicles only. The Catalyst Monitor is a “Two-Trip” Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL “On” and saves the code in its long-term memory.



**Heated Catalyst Monitor** - Operation of the “heated” catalytic converter is similar to the catalytic converter. The main difference is that a heater is added to bring the catalytic converter to its operating temperature more quickly. This helps reduce emissions by reducing the converter’s down time when the engine is cold. The Heated Catalyst Monitor performs the same diagnostic tests as the catalyst Monitor, and also tests the catalytic converter’s heater for proper operation.

The Heated Catalyst Monitor is supported by “spark ignition” vehicles only. This Monitor is also a “Two-Trip” Monitor.



**Exhaust Gas Recirculation (EGR) Monitor** - The Exhaust Gas Recirculation (EGR) system helps reduce the formation of Oxides of Nitrogen during combustion. Temperatures above 2500°F cause nitrogen and oxygen to combine and form Oxides of Nitrogen in the combustion chamber. To reduce the formation of Oxides of Nitrogen, combustion temperatures must be kept below 2500°F. The EGR system recirculates small amounts of exhaust gas back into the intake manifold, where it is mixed with the incoming air/fuel mixture. This reduces combustion temperatures by up to 500°F. The computer determines when, for how long, and how much exhaust gas is recirculated back to the intake manifold. The EGR Monitor performs EGR system function tests at preset times during vehicle operation.

The EGR Monitor is supported by both “spark ignition” vehicles and “compression ignition” vehicles. The EGR Monitor is a “Two-Trip” Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL “On,” and saves the code in its long-term memory.



**Evaporative System (EVAP) Monitor** - OBD2 vehicles are equipped with a fuel Evaporative system (EVAP) that helps prevent fuel vapors from evaporating into the air. The EVAP system carries fumes from the fuel tank to the engine where they are burned during combustion. The EVAP system may consist of a charcoal canister, fuel tank cap, purge solenoid, vent solenoid, flow monitor, leak detector and connecting tubes, lines and hoses.

Fumes are carried from the fuel tank to the charcoal canister by hoses or tubes. The fumes are stored in the charcoal canister. The computer controls the flow of fuel vapors from the charcoal canister to the engine via a purge solenoid. The computer energizes or de-energizes the purge solenoid (depending on solenoid design). The purge solenoid opens a

valve to allow engine vacuum to draw the fuel vapors from the canister into the engine where the vapors are burned. The EVAP Monitor checks for proper fuel vapor flow to the engine, and pressurizes the system to test for leaks. The computer runs this Monitor once per trip.

The EVAP Monitor is supported by "spark ignition" vehicles only. The EVAP Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the PCM commands the MIL "On," and saves the code in its long-term memory.



**Oxygen Sensor Heater Monitor** - The Oxygen Sensor Heater Monitor tests the operation of the oxygen sensor's heater. There are two modes of operation on a computer-controlled vehicle: "open-loop" and "closed-loop." The vehicle operates in open-loop when the engine is cold, before it reaches normal operating temperature. The vehicle also goes to open-loop mode at other times, such as heavy load and full throttle conditions. When the vehicle is running in open-loop, the oxygen sensor signal is ignored by the computer for air/fuel mixture corrections. Engine efficiency during open-loop operation is very low, and results in the production of more vehicle emissions.

Closed-loop operation is the best condition for both vehicle emissions and vehicle operation. When the vehicle is operating in closed-loop, the computer uses the oxygen sensor signal for air/fuel mixture corrections.

In order for the computer to enter closed-loop operation, the oxygen sensor must reach a temperature of at least 600°F. The oxygen sensor heater helps the oxygen sensor reach and maintain its minimum operating temperature (600°F) more quickly, to bring the vehicle into closed-loop operation as soon as possible.

The Oxygen Sensor Heater Monitor is supported by "spark ignition" vehicles only. The Oxygen Sensor Heater Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.



**Oxygen Sensor Monitor** - The Oxygen Sensor monitors how much oxygen is in the vehicle's exhaust. It generates a varying voltage of up to one volt, based on how much oxygen is in the exhaust gas, and sends the signal to the computer. The computer uses this signal to make corrections to the air/fuel mixture. If the exhaust gas has a large amount of oxygen (a lean air/fuel mixture), the oxygen sensor generates a "low" voltage signal. If the exhaust gas has very little oxygen (a rich mixture condition), the oxygen sensor generates a "high" voltage signal. A 450mV signal indicates the most efficient, and least polluting, air/fuel ratio of 14.7 parts of air to one part of fuel.

The oxygen sensor must reach a temperature of at least 600-650°F, and the engine must reach normal operating temperature, for the computer to enter into closed-loop operation. The oxygen sensor only functions when the computer is in closed-loop. A properly operating

oxygen sensor reacts quickly to any change in oxygen content in the exhaust stream. A faulty oxygen sensor reacts slowly, or its voltage signal is weak or missing.

The Oxygen Sensor Monitor is supported by “spark ignition” vehicles only. The Oxygen Sensor Monitor is a “Two-Trip” monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL “On,” and saves the code in its long-term memory.



**Secondary Air System Monitor** - When a cold engine is first started, it runs in open-loop mode. During open-loop operation, the engine usually runs rich. A vehicle running rich wastes fuel and creates increased emissions, such as carbon monoxide and some hydrocarbons. A Secondary Air System injects air into the exhaust stream to aid catalytic converter operation:

3. It supplies the catalytic converter with the oxygen it needs to oxidize the carbon monoxide and hydrocarbons left over from the combustion process during engine warm-up.
4. The extra oxygen injected into the exhaust stream also helps the catalytic converter reach operating temperature more quickly during warm-up periods. The catalytic converter must heat to operating temperature to work properly.

The Secondary Air System Monitor checks for component integrity and system operation, and tests for faults in the system. The computer runs this Monitor once per trip.

The Secondary Air System Monitor is a “Two-Trip” monitor. If a fault is found on the first trip, the computer temporarily saves this fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL “On,” and saves the code in its long-term memory.



**Non-Methane Hydrocarbon Catalyst (NMHC) Monitor** - The non-methane hydrocarbon catalyst is a type of catalytic converter. It helps to remove non-methane hydrocarbons (NMH) left over from the combustion process from the exhaust stream. To accomplish this, heat and catalyst materials react with the exhaust gases to convert NMH to less harmful compounds. The computer checks the efficiency of the catalyst by monitoring the quantity of NMH in the exhaust stream. The monitor also verifies that sufficient temperature is present to aid in particulate matter (PM) filter regeneration.

The NMHC Monitor is supported by “compression ignition” vehicles only. The NMHC Monitor is a “Two-Trip” Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL “On,” and saves the code in its long-term memory.



**NOx Aftertreatment Monitor** - NOx aftertreatment is based on a catalytic converter support that has been coated with a special washcoat containing zeolites. NOx Aftertreatment is designed to reduce oxides of nitrogen emitted in the exhaust stream. The zeolite acts as a molecular "sponge" to trap the NO and NO<sub>2</sub> molecules in the exhaust stream. In some implementations, injection of a reactant before the aftertreatment purges it. NO<sub>2</sub> in particular is unstable, and will join with hydrocarbons to produce H<sub>2</sub>O and N<sub>2</sub>. The NOx Aftertreatment Monitor monitors the function of the NOx aftertreatment to ensure that tailpipe emissions remain within acceptable limits.

The NOx Aftertreatment Monitor is supported by "compression ignition" vehicles only. The NOx Aftertreatment Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.



**Boost Pressure System Monitor** - The boost pressure system serves to increase the pressure produced inside the intake manifold to a level greater than atmospheric pressure. This increase in pressure helps to ensure complete combustion of the air-fuel mixture. The Boost Pressure System Monitor checks for component integrity and system operation, and tests for faults in the system. The computer runs this Monitor once per trip.

The Boost Pressure System Monitor is supported by "compression ignition" vehicles only. The Boost Pressure System Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.



**Exhaust Gas Sensor Monitor** - The exhaust gas sensor is used by a number of systems/monitors to determine the content of the exhaust stream. The computer checks for component integrity, system operation, and tests for faults in the system, as well as feedback faults that may affect other emission control systems.

The Exhaust Gas Sensor Monitor is supported by "compression ignition" vehicles only. The Exhaust Gas Sensor Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.



**PM Filter Monitor** - The particulate matter (PM) filter removes particulate matter from the exhaust stream by filtration. The filter has a honeycomb structure similar to a catalyst substrate, but with the channels blocked at alternate ends. This forces the exhaust gas to flow through the walls between the channels, filtering the particulate matter out. The filters are self-cleaning by periodic modification of the exhaust gas concentration in order to burn off the trapped particles (oxidizing the particles to form CO<sub>2</sub> and water). The computer monitors the efficiency of the filter in trapping particulate matter, as well as the ability of the filter to regenerate (self-clean).

The PM Filter Monitor is supported by “compression ignition” vehicles only. The PM Filter Monitor is a “Two-Trip” Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL “On,” and saves the code in its long-term memory.

### OBD2 Reference Table

The table below lists current OBD2 Monitors, and indicates the following for each Monitor:

- A. Monitor Type (how often does the Monitor run; Continuous or Once per trip)
- B. Number of trips needed, with a fault present, to set a pending DTC
- C. Number of consecutive trips needed, with a fault present, to command the MIL “On” and store a DTC
- D. Number of trips needed, with no faults present, to erase a Pending DTC
- E. Number and type of trips or drive cycles needed, with no faults present, to turn off the MIL
- F. Number of warm-up periods needed to erase the DTC from the computer’s memory after the MIL is turned off

<b>Name of Monitor</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
Comprehensive Component Monitor	Continuous	1	2	1	3	40
Misfire Monitor (Type 1 and 3)	Continuous	1	2	1	3 - similar conditions	80
Misfire Monitor (Type 2)	Continuous		1		3 - similar conditions	80
Fuel System Monitor	Continuous	1	1 or 2	1	3 - similar conditions	80
Catalytic Converter Monitor	Once per trip	1	2	1	3 trips	40
Oxygen Sensor Monitor	Once per trip	1	2	1	3 trips	40
Oxygen Sensor Heater Monitor	Once per trip	1	2	1	3 trips	40
Exhaust Gas Recirculation (EGR) Monitor	Once per trip	1	2	1	3 trips	40
Evaporative Emissions Controls Monitor	Once per trip	1	2	1	3 trips	40
Secondary Air System (AIR) Monitor	Once per trip	1	2	1	3 trips	40
NMHC Monitor	Once per trip	1	2	1	3 trips	40
Nox Adsorber Monitor	Once per trip	1	2	1	3 trips	40
Boost Pressure System Monitor	Once per trip	1	2	1	3 trips	40
Exhaust Gas Sensor Monitor	Once per trip	1	2	1	3 trips	40
PM Filter Monitor	Once per trip	1	2	1	3 trips	40



## CODE RETRIEVAL PROCEDURE

**Retrieving and using Diagnostic Trouble Codes (DTCs) for troubleshooting vehicle operation is only one part of an overall diagnostic strategy.**

**Never** replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. Always refer to the vehicle's service manual for detailed testing instructions.

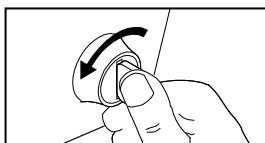


*Check your vehicle thoroughly before performing any test.*



**ALWAYS** observe safety precautions whenever working on a vehicle.

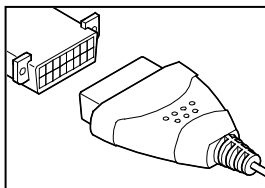
1. Turn the ignition off.
2. Locate the vehicle's 16-pin Data Link Connector (DLC).



*Some DLCs have a plastic cover that must be removed before connecting the Scan Tool cable connector.*



*If the Scan Tool is ON, turn it OFF BEFORE connecting the Scan Tool to the DLC.*





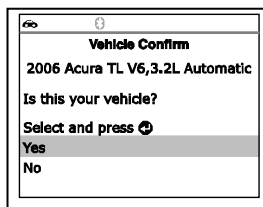
3. Connect the Scan Tool to the vehicle's DLC. The cable connector is keyed and will only fit one way.
  - If you have problems connecting the cable connector to the DLC, rotate the connector 180°.
  - If you still have problems, check the DLC on the vehicle and on the Scan Tool.
4. Turn the ignition on. **DO NOT** start the engine.
5. When the Scan Tool is properly connected to the vehicle's DLC, the unit automatically turns ON.
  - If the unit does not power on automatically, it may indicate there is no power present at the vehicle's DLC connector. Check the fuse panel and replace any burned-out fuses.
  - If replacing the fuse(s) does not correct the problem, consult your vehicle's repair manual to identify the proper computer (PCM) fuse/circuit, and perform any necessary repairs before proceeding.



- The Scan Tool automatically starts a check of the vehicle's computer to determine which type of communication protocol it is using. When the Scan Tool identifies the computer's communication protocol, a communication link is established.

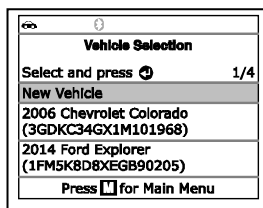


A **PROTOCOL** is a set of rules and procedures for regulating data transmission between computers, and between testing equipment and computers. As of this writing, five different types of protocols (ISO 9141, Keyword 2000, J1850 PWM, J1850 VPW and CAN) are in use by vehicle manufacturers.

- If the Scan Tool fails to link to the vehicle's computer, a "Communication Error" message shows.
    - Ensure your vehicle is OBD2 compliant.
    - Verify the connection at the DLC, and verify the ignition is ON.
    - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
    - Press **LINK**  to continue.
  - If the Scan Tool **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.
    - Press the **SYSTEM MENU**  button to return to the System Menu.
    - Turn the ignition off, and disconnect the Scan Tool.
    - Contact Technical Support for assistance.
- If the Scan Tool can decode the Vehicle Identification Number (VIN) for the vehicle under test, the Confirm Vehicle screen displays.



- If the information shown is correct for the vehicle under test, select **Yes**, then press **ENTER** . Proceed to step 10.
  - If the information shown is not correct for the vehicle under test, or if you wish to manually select the vehicle, select **No**, then press **ENTER** . Proceed to step 8.
  - If the Scan Tool **cannot** decode the Vehicle Identification Number (VIN) for the vehicle under test, the Select Vehicle screen displays. Proceed to step 8.
- When **No** is selected from the Vehicle information screen, the Select Vehicle screen displays. The Select Vehicle screen lists the three most recently tested vehicles.



- To select a previously tested vehicle, select the desired vehicle, then press **ENTER** . Proceed to step 10.
  - To select a new vehicle, select **New Vehicle**, then press **ENTER** . Proceed to step 9.
9. When **New Vehicle** is chosen from the Select Vehicle screen, the Select Year screen displays.
- Select the desired vehicle model year, then press **ENTER** to continue.
    - The Select Make screen displays.
  - Select the desired vehicle make, then press **ENTER** to continue.
    - The Select Model screen displays.
  - Select the desired vehicle model, then press **ENTER** to continue.
    - The Select Engine screen displays.
  - Select the desired vehicle engine size, then press **ENTER** to continue.
    - The Select Transmission screen displays.
  - Select the desired transmission type, then press **ENTER** to continue. The Vehicle Information screen displays.
  - If the information shown is correct for the vehicle under test, select **Yes**, then press **ENTER** . Proceed to step 10.
  - If the information shown is not correct for the vehicle under test, or if you wish to reselect the vehicle, select **No**, then press **ENTER** to return to the Select Year screen.
10. After approximately 10~60 seconds, the Scan Tool will **retrieve** and **display** any Diagnostic Trouble Codes, Monitor Status and Freeze Frame Data retrieved from the vehicle's computer memory.
- The Scan Tool will display a code only if codes are present. If no codes are present, the message "No Powertrain DTCs or Freeze Frame Data presently stored in the vehicle's computer" displays.

Vehicle Selection		
Select and press		
Previous	1996	1997
1998	1999	2000
2001	2002	2003
2004	2005	2006
2007	2008	Next

Vehicle Selection	
2006	
Select and press	
Previous	Acura
AM General	Audi
BMW	Bulck
Cadillac	Next

Vehicle Selection	
2006 Acura	
Select and press	
Previous	CSX
MDX	RL
RSX	TL
TSX	Not Listed

Vehicle Selection	
2006 Acura TL	
Select and press	
Previous	V6,3.2L
Not Listed	

Vehicle Selection	
2006 Acura TL V6,3.2L	
Select and press	
Previous	Manual
Automatic	

# Using the Scan Tool

## CODE RETRIEVAL PROCEDURE

- The Scan Tool is capable of retrieving and storing up to 32 codes in memory, for immediate or later viewing.

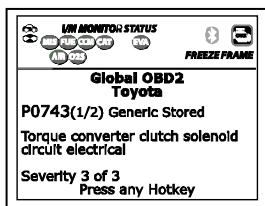
11. Refer to DISPLAY FUNCTIONS on page 3 for a description of display elements.



*In the case of long code definitions, a small arrow is shown in the upper/lower right-hand corner of the Scan Tool display area to indicate the presence of additional information.*



*If a definition for the currently displayed code is not available, an advisory message shows on the Scan Tool's display.*



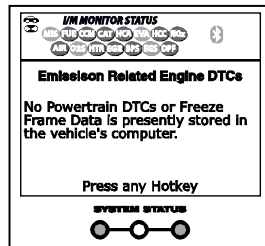
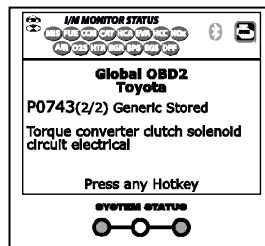
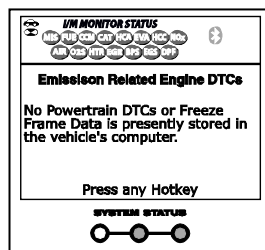
12. Read and interpret Diagnostic Trouble Codes/system condition using the display and the green, yellow and red LEDs.



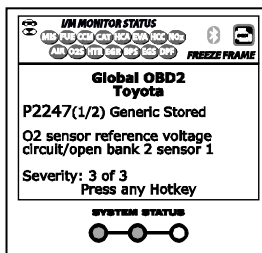
*The green, yellow and red LEDs are used (with the display) as visual aids to make it easier to determine engine system conditions.*

- **Green LED** – Indicates that all engine systems are “OK” and operating normally. All monitors supported by the vehicle have run and performed their diagnostic testing, and no trouble codes are present. All Monitor icons will be solid.
- **Yellow LED** – Indicates one of the following conditions:

- A. **PENDING CODE IS PRESENT** – If the yellow LED is illuminated, it may indicate a Pending code is present. Check the display for confirmation. A Pending code is confirmed by the presence of a numeric code and the word PENDING.
- B. **MONITOR NOT RUN STATUS** – If the display shows a zero (indicating there are no DTC's present in the vehicle's computer memory), but the yellow LED is illuminated, it may be an indication that some of the Monitors supported by the vehicle have not yet run and completed their diagnostic testing. Check the display for confirmation. All Monitor icons that are **blinking** have not yet run and completed their diagnostic testing; all Monitor icons that are **solid** have run and completed their diagnostic testing.

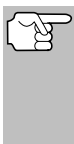
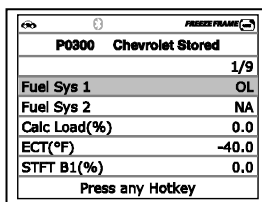


- **Red LED** – Indicates there is a problem with one or more of the vehicle's systems. The red LED is also used to indicate that DTC(s) are present. In this case, the Malfunction Indicator (Check Engine) lamp on the vehicle's instrument panel will be illuminated.
- DTC's that start with "P0", "P2" and some "P3" are considered Generic (Universal). All Generic DTC definitions are the same on all OBD2 equipped vehicles. The Scan Tool automatically displays the code definitions (if available) for Generic DTC's.
- DTC's that start with "P1" and some "P3" are Manufacturer specific codes and their code definitions vary with each vehicle manufacturer.



**13.** If more than one DTC was retrieved, and to view Freeze Frame Data, press and release **DTC/FF** as necessary.

- Each time **DTC/FF** is pressed and released, the Scan Tool will scroll and display the next DTC in sequence until all DTCs in its memory have displayed.
- Freeze Frame Data (if available) will display after DTC #1.
- In OBD2 systems, when an emissions-related engine malfunction occurs that causes a DTC to set, a record or snapshot of engine conditions at the time that the malfunction occurred is also saved in the vehicle's computer memory. The record saved is called Freeze Frame data. Saved engine conditions include, but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate, and intake manifold pressure.



*If more than one malfunction is present that causes more than one DTC to be set, only the code with the highest priority will contain Freeze Frame data. The code designated "01" on the Scan Tool display is referred to as the PRIORITY code, and Freeze Frame data always refers to this code. The priority code is also the one that has commanded the MIL on.*



- 14.** When the last retrieved DTC has been displayed and **DTC/FF** is pressed, the Scan Tool returns to the "Priority" Code.
- 15.** Determine engine system(s) condition by viewing the Scan Tool's display for any retrieved Diagnostic Trouble Codes, code definitions and Freeze Frame data, interpreting the green, yellow and red LEDs.
- If DTC's were retrieved and you are going to perform the repairs yourself, proceed by consulting the Vehicle's Service Repair Manual for testing instructions, testing procedures, and flow charts related to retrieved code(s).

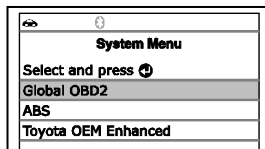
### THE SYSTEM MENU

The System Menu provides the ability to retrieve “enhanced” DTCs and Anti-Lock Brake System (ABS) DTCs for most BMW, Chrysler/Jeep, Ford/Mazda, GM/Isuzu, Honda/Acura, Hyundai, Mercedes Benz, Nissan, Toyota/Lexus, Volkswagen and Volvo vehicles. The types of enhanced data available depends on the vehicle make. You can also return to the Global OBD2 mode.



*Depending on the vehicle under test, some features and functions may not be available.*

- To access the System Menu, press **SYSTEM MENU** . Select the desired option, then press **ENTER**  to view the selected information.





**To view ABS DTCs:** Select **ABS** from the System Menu. Refer to VIEWING ABS DTCs on page 31 to view ABS DTCs for your vehicle.

**To view SRS DTCs:** Select **SRS** from the System Menu. Refer to VIEWING SRS DTCs on page 32 to view SRS DTCs for your vehicle.

**To view OEM enhanced DTCs:** Select **OEM Enhanced** from the System Menu. Refer to VIEWING OEM ENHANCED DTCs on page 28 to view OEM enhanced DTCs for your vehicle.

### VIEWING OEM ENHANCED DTCs (except Ford/Mazda)

When (**make**) **OEM Enhanced** is chosen from the System Menu, the Scan Tool retrieves OEM enhanced DTCs from the vehicle's computer.

1. A “One moment please” message displays while the Scan Tool retrieves the selected DTCs.
  - If the Scan Tool fails to link to the vehicle's computer, a “Communication Error” message shows.
    - Ensure your vehicle is OBD2 compliant.
    - Verify the connection at the DLC, and verify the ignition is ON.
    - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
    - Press **LINK**  to continue.
  - If the Scan Tool **cannot** link to the vehicle's computer after three attempts, the message “Contact Technical Support” displays.
    - Press **SYSTEM MENU**  to return to the System Menu.
    - Turn the ignition off, and disconnect the Scan Tool.
    - Contact Technical Support for assistance.
2. Refer to DISPLAY FUNCTIONS on page 3 for a description of LCD display elements.



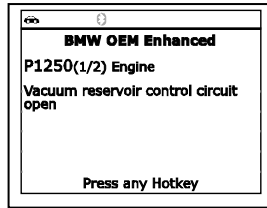
If the definition for the currently displayed code is not available, an advisory message shows.



I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.



In the case of long code definitions, a small arrow is shown in the upper/lower right-hand corner of the code display area to indicate the presence of additional information.



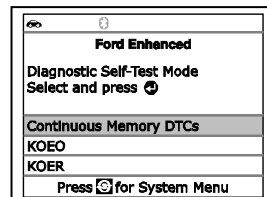
- If no codes are present, the message “No OEM Enhanced DTC’s are presently stored in the vehicle’s computer” shows. Press **SYSTEM MENU** to return to the System Menu.
3. If more than one code was retrieved press **DTC/FF**, as necessary, to display additional codes one at a time.
    - Whenever the Scroll function is used to view additional codes, the Scan Tool’s communication link with the vehicle’s computer disconnects. To re-establish communication, press **LINK** again.
  4. When the last retrieved DTC has been displayed and **DTC/FF** is pressed, the Scan Tool returns to the “Priority” Code.
    - To exit the enhanced mode, press **SYSTEM MENU** to return to the System Menu. Select **Global OBD**, then press **ENTER** to return to the Global OBD2 mode.

## VIEWING OEM ENHANCED DTCs (Ford/Mazda only)



Mazda Enhanced DTCs are available for Mazda-branded Ford vehicles only.







When **Ford OEM Enhanced** is chosen from the System Menu, the Ford Enhanced menu displays. You may view OEM DTCs for either the “Continuous Memory Test”, “KOEO (Key On Engine Off) Test” or “KOER (Key On Engine Running) Test.”



1. Select the desired option, then press **ENTER** .

  - If **KOER** is selected, an advisory message shows.
    - Start and warm the engine to normal operating temperature, then press **ENTER** . Proceed to step 3.

2. If **KOEO** or **Continuous Memory** is selected, an “instructional” message shows.
  - Turn the ignition OFF, then back ON. Press **ENTER** . Proceed to step 3.

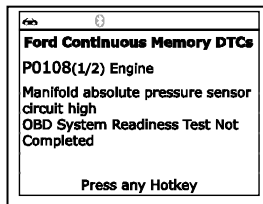
- A "One moment please" message displays while the test is in progress.
  - If the Scan Tool fails to link to the vehicle's computer, a "Communication Error" message shows.
    - Ensure your vehicle is OBD2 compliant.
    - Verify the connection at the DLC, and verify the ignition is ON.
    - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
    - Press **LINK**  to continue.
  - If the Scan Tool **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.
    - Press **SYSTEM MENU**  to return to the System Menu.
    - Turn the ignition off, and disconnect the Scan Tool.
    - Contact Technical Support for assistance.
  - If the **KOER** Test was selected, and the vehicle's engine *is not* running, an advisory message shows.
    - Start the engine and press **ENTER**  to try again, or, press **SYSTEM MENU**  to return to the System Menu.
  - If the **KOEO** Test was selected, and the vehicle's engine *is running*, an advisory message shows.
    - Turn the ignition OFF then back ON and press **ENTER**  to try again, or, press **SYSTEM MENU**  to return to the System Menu.
- If the **KOER** test was selected, an "instructional" message shows.
  - Turn the steering wheel to the left, then release.
  - Press and release the brake pedal.
  - Cycle the overdrive switch (if equipped).
  - A "One moment please" message displays while the test is in progress.
- Refer to DISPLAY FUNCTIONS on page 3 for a description of LCD display elements.





*I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.*

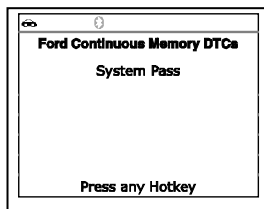


*In the case of long code definitions, a small arrow is shown in the upper/ lower right-hand corner of the code display area to indicate the presence of additional information.*





- If no codes are present, a "System Pass" message displays. Press any Hotkey.
6. If more than one code was retrieved press **DTC/FF** to display additional codes one at a time.
  7. When the last retrieved DTC has been displayed and **DTC/FF** is pressed, the Scan Tool returns to the "Priority" Code.
    - To view *additional* enhanced DTCs, repeat steps 1 through 5, above.
    - To exit the enhanced mode, press **SYSTEM MENU**  to return to the System Menu. Select **Global OBD**, then press **ENTER**  to return to the Global OBD2 mode.






## VIEWING ABS DTCs



Refer to the manufacturer's website for vehicle makes covered.

## Reading ABS DTCs

1. When **ABS** is chosen from the System Menu, a "One moment please" message displays while the Scan Tool retrieves the selected DTCs.
  - If ABS functionality is not supported, an advisory message shows. Press **SYSTEM MENU**  to return to the System Menu.
  - If the Scan Tool fails to link to the vehicle's computer, a "Communication Error" message shows.
    - Ensure your vehicle is OBD2 compliant.
    - Verify the connection at the DLC, and verify the ignition is ON.
    - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
    - Press **LINK**  to continue.
  - If the Scan Tool **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.
    - Press **SYSTEM MENU**  to return to the System Menu.
    - Turn the ignition off, and disconnect the Scan Tool.
    - Contact Technical Support for assistance.
2. Refer to DISPLAY FUNCTIONS on page 3 for a description of LCD display elements.



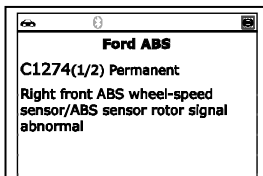
If the definition for the currently displayed code is not available, an advisory message shows.



I/M MONITOR STATUS icons are not displayed when viewing ABS DTCs.



In the case of long code definitions, a small arrow is shown in the upper/lower right-hand corner of the code display area to indicate the presence of additional information.



- If no codes are present, the message "No ABS DTC's are presently stored in the vehicle's computer" shows. Press **SYSTEM MENU** to return to the System Menu.
3. If more than one code was retrieved press **DTC/FF** to display additional codes one at a time.
    - Whenever the Scroll function is used to view additional codes, the Scan Tool's communication link with the vehicle's computer disconnects. To re-establish communication, press **LINK** again.
  4. When the last retrieved DTC has been displayed and **DTC/FF** is pressed, the Scan Tool returns to the "Priority" Code.
    - To exit the enhanced mode, press **SYSTEM MENU** to return to the System Menu. Select **Global OBD**, then press **ENTER** to return to the Global OBD2 mode.


## VIEWING SRS DTCs



Refer to the manufacturer's website for vehicle makes covered.

## Reading SRS DTCs

1. When **SRS** is chosen from the System Menu, a "One moment please" message displays while the Scan Tool retrieves the selected DTCs.
  - If SRS functionality is not supported, an advisory message shows. Press **SYSTEM MENU** to return to the System Menu.
  - If the Scan Tool fails to link to the vehicle's computer, a "Communication Error" message shows.
    - Ensure your vehicle is OBD2 compliant.
    - Verify the connection at the DLC, and verify the ignition is ON.
    - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
    - Press **LINK** to continue.

- If the Scan Tool **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.
    - Press **SYSTEM MENU**  to return to the System Menu.
    - Turn the ignition off, and disconnect the Scan Tool.
    - Contact Technical Support for assistance.
2. Refer to DISPLAY FUNCTIONS on page 3 for a description of LCD display elements.



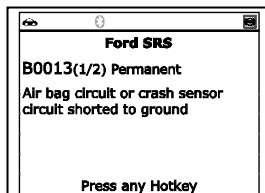
*If the definition for the currently displayed code is not available, an advisory message shows*







*I/M MONITOR STATUS icons are not displayed when viewing SRS DTCs.*



*In the case of long code definitions, a small arrow is shown in the upper/lower right-hand corner of the code display area to indicate the presence of additional information.*



- If no codes are present, the message "No SRS DTC's are presently stored in the vehicle's computer" shows. Press **SYSTEM MENU**  to return to the System Menu.
3. If more than one code was retrieved press **DTC** to display additional codes one at a time.
- Whenever the Scroll function is used to view additional codes, the Scan Tool's communication link with the vehicle's computer disconnects. To re-establish communication, press **LINK**  again.
4. When the last retrieved DTC has been displayed and **DTC/FF** is pressed, the Scan Tool returns to the "Priority" code.
- To exit the enhanced mode, press **SYSTEM MENU**  to return to the System Menu. Select **Global OBD**, then press **ENTER**  to return to the Global OBD2 mode.

## ERASING DIAGNOSTIC TROUBLE CODES (DTCs)



*When the Scan Tool's ERASE function is used to erase DTCs from the vehicle's on-board computer, "Freeze Frame" data and manufacturer-specific-enhanced data are also erased. "Permanent" DTCs ARE NOT erased by the ERASE function.*

If you plan to take the vehicle to a Service Center for repair, **DO NOT** erase the codes from the vehicle's computer. If the codes are erased, valuable information that might help the technician troubleshoot the problem will also be erased.

Erase DTCs from the computer's memory as follows:

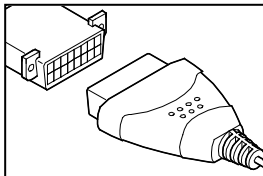
# Using the Scan Tool

## ERASING DIAGNOSTIC TROUBLE CODES (DTCs)



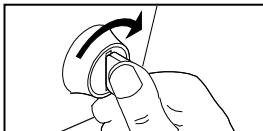
When DTCs are erased, the I/M Readiness Monitor Status program resets the status of all Monitors to a not run condition. To set all Monitors to a DONE status, an OBD2 Drive Cycle must be performed.

1. If not connected already, connect the Scan Tool to the vehicle's DLC, and turn the ignition "On." (If the Scan Tool is already connected and linked to the vehicle's computer, proceed directly to step 3. If not, continue to step 2.)



2. Perform the Code Retrieval procedure as described on page 23.

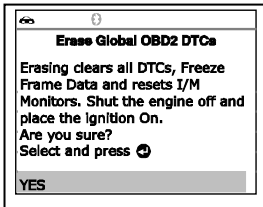
- **To erase OBD2 DTCs:** Wait until the codes are displayed, then proceed to step 3.



- **To erase enhanced, ABS or SRS DTCs:** Press **SYSTEM MENU** to display the System Menu. Select the desired option, then press **ENTER** . Perform the appropriate Code Retrieval procedure and then proceed to step 3.

3. Press and release **ERASE** . A confirmation message shows.

- If you are sure you want to proceed, select **Yes**, then press **ENTER** .
- If you do not want to proceed, select **No**, then press **ENTER** to cancel the erase procedure.

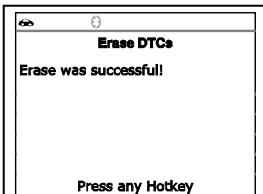


4. If you chose to erase DTCs, a "One moment please..." message displays while the erase function is in progress.



If the vehicle's engine is running, an advisory message shows. Turn the engine OFF, then turn the ignition back to ON. DO NOT start the engine. Press **ENTER** to continue.

- If the erase was successful, a confirmation message shows. The Scan Tool automatically relinks to the vehicle's computer after 3 seconds.



If the erase was not successful and ECU error code \$22 is present, an advisory message displays. Start the engine and maintain vehicle speed at 0, then press **ERASE** to try again.

- If the erase was not successful, an advisory message shows indicating the erase request was sent to the vehicle's computer. The Scan Tool automatically relinks to the vehicle's computer after 3 seconds.



*Erasing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again (and the Check Engine Light will illuminate) as soon as the vehicle is driven long enough for its Monitors to complete their testing.*

## ABOUT REPAIRSOLUTIONS®

RepairSolutions 2® is a web-based service created to assist both Do-It-Yourself and Professional technicians in quickly and accurately diagnosing and repairing today's vehicles. RepairSolutions 2 allows you to view and save the diagnostic data retrieved from a vehicle's on-board computer(s) using your Code Reader. At the core of RepairSolutions 2 is an extensive knowledge database, developed by compiling and analyzing years worth of "real world" vehicle service data. RepairSolutions 2 builds on manufacturer-recommended diagnostic and repair information by providing verified, vehicle-specific fixes supplied by ASE technicians across the country. RepairSolutions 2 also provides access to an extensive knowledge database including:

- **Verified Fixes** – Find the most likely fixes reported and verified by ASE Technicians for the retrieved DTCs.
- **Repair Instructions** – View available repair instructions to properly perform the fix.
- **Video Tutorials** – Watch repair video tutorials for valuable repair tips.
- **Technical Service Bulletins** – Research known problems reported by vehicle manufacturers.
- **Safety Recalls** – Research known safety concerns applicable to a vehicle.

And much more. Please visit [www.innova.com](http://www.innova.com) for additional information.

### Hardware Requirements:

- Innova Scan Tool with Bluetooth/WiFi
- Android or iOS Smart Device

### Accessing RepairSolutions 2®

1. Download and install the RepairSolutions 2® app from the App Store (for iOS devices) or Google Play (for Android devices).
2. Launch the RepairSolutions 2 app and log in to your account.
  - If you have not yet established an account, you must register for a FREE RepairSolutions 2 account before proceeding.
  - Connect the Code Reader to a vehicle and establish a Bluetooth or WiFi connection with your Smart Device (refer to CONNECTING TO BLUETOOTH / WIFI, below). Be sure your Smart Device is connected to an available WiFi network.

- The RepairSolutions 2 app will store two WiFi configurations only.
- 3. Retrieve diagnostic data (refer to CODE RETRIEVAL PROCEDURE on page 23 for details).
- 4. The RepairSolutions 2 app automatically displays a report based on the retrieved diagnostic data.
  - If the Code Reader is not connected to WiFi or Bluetooth, vehicle data will not be saved.

## CONNECTING TO BLUETOOTH / WIFI

Launch the RepairSolutions2 app and follow the prompts to establish Bluetooth and (optionally) WiFi connections, as follows:

1. Launch the RepairSolutions2 app. Select **Wifi Tools Settings** from the menu. Power on your Code Reader, then select from the list of available devices.
2. When Bluetooth pairing is complete, a confirmation screen displays. Click **Continue**.
  - If a Bluetooth connection cannot be established, an advisory message displays. Tap **Try Again** to repeat the pairing process.
3. Follow the on-screen prompts to connect to an available WiFi network.
  - You can automatically connect to the network your Smart Device is currently connected to, or you can manually connect to another available network.
  - Note that only 2.4GHz networks are supported.
  - If you do not wish to connect to a WiFi network at this time, tap **SKIP**.
4. When WiFi pairing is complete, a confirmation screen displays. Click **Continue** to view the "Setup Complete" message, then click **Continue** to enter RepairSolutions2.
  - If a WiFi connection cannot be established, an advisory message displays. Tap **Try Again** to repeat the pairing process.

The Scan Tool lets you view "real-time" Live Data. This information includes values (volts, rpm, temperature, speed etc.) and system status information (open loop, closed loop, fuel system status, etc.) generated by the various vehicle sensors, switches and actuators. These are the same signal values generated by the sensors, actuators, switches and/or vehicle system status information used by the vehicle's computer when calculating and conducting system adjustments and corrections.



The real time (Live Data) vehicle operating information (values/status) that the computer supplies to the Scan Tool for each sensor, actuator, switch, etc. is called Parameter Identification (PID) Data.

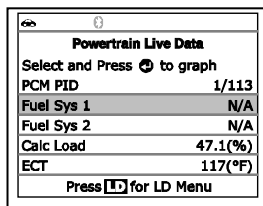
Each PID (sensor, actuator switch, status, etc.) has a set of operating characteristics and features (parameters) that serve to identify it. The Scan Tool displays this information for each sensor, actuator, switch or status that is supported by the vehicle under test.




**WARNING:** If the vehicle must be driven in order to perform a troubleshooting procedure, **ALWAYS** have a second person help you. One person should drive the vehicle while the other person observes the Scan Tool data. Trying to drive and operate the Scan Tool at the same time is dangerous, and could cause a serious traffic accident.

## VIEWING LIVE DATA



1. While linked to the vehicle, start the engine, then press **LD**.
2. A "One moment please . . ." message displays while the Scan Tool establishes communication with the vehicle.
  - If the Scan Tool fails to establish communication with the vehicle, a "Communication Error" message displays.
    - Ensure your vehicle is OBD2 compliant.
    - Verify the connection at the DLC, and verify the ignition is ON.
    - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
    - Press **ENTER**  to continue.
3. Real-time Live Data (PID) information supported by the vehicle under test displays.
  - If Live Data is not supported by the vehicle under test, an advisory message displays. Press **SYSTEM MENU**  to return to the System Menu. Live Data is not available for your vehicle.



Powertrain Live Data	
Select and Press  to graph	
PCM PID	1/113
Fuel Sys 1	N/A
Fuel Sys 2	N/A
Calc Load	47.1(%)
ECT	117(°F)
Press [LD] for LD Menu	






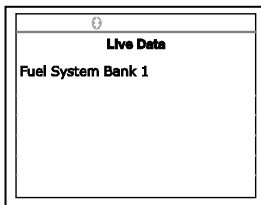
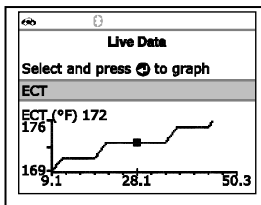
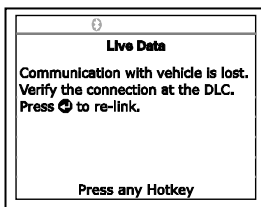
*The values for the various PIDS displayed may change as the vehicle's operating conditions change.*

4. Only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow is shown on the display. Press **UP**  and **DOWN** , as necessary, to view all available PID data.

# Live Data Mode

## CUSTOMIZING LIVE DATA (PIDs)



- If communication with the vehicle is lost while viewing Live Data, an advisory message displays.
5. Press and release **ENTER**  to view the currently selected PID in "graph" mode. Press and release **ENTER**  again to return to the PID list.
    - You can display a maximum of two PIDs in "graph" mode at any given time.
    - With two PID shown in "graph" mode, press and hold **LD** to superimpose one graph on the other. Release **LD** to separate the graphs.
  6. Press and hold **ENTER**  to view the "expanded" definition for the currently selected PID. Release to return to the PID list.
  7. If you experience vehicle problems, view and/or compare the Live Data (PID) information displayed on the Scan Tool to specifications in the vehicle's repair manual.

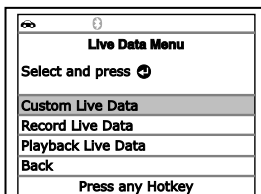


If desired, you can "customize" the Live Data display to show only those PIDs you are interested in viewing. See **Customizing Live Data (PIDs)** below for details.










## CUSTOMIZING LIVE DATA (PIDs)

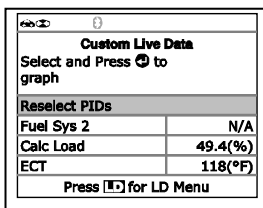
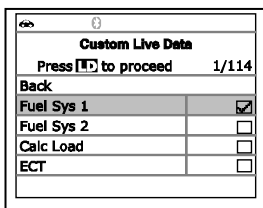
You can customize the Live Data display by placing the Scan Tool in "Custom Live Data" mode and selecting only the PIDs that you wish to display.

1. With the Scan Tool in Live Data mode (see VIEWING LIVE DATA on page 37), press and hold **LD** until the Live Data Menu displays, then release
  2. Select **Custom Live Data**, then press **ENTER** .
- If the Scan Tool fails to establish communication with the vehicle, a "Communication Error" message displays.
    - Ensure your vehicle is OBD2 compliant.
    - Verify the connection at the DLC, and verify the ignition is ON.
    - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
    - Press **LINK**  to continue.





- If Live Data is not supported by the vehicle under test, an advisory message displays. Press **SYSTEM MENU**  to return to the System Menu.
  - If custom Live Data was previously configured, the Select PIDs to Use screen displays.
    - To use the *existing* custom Live data selections, select **Use existing PIDs**, then press **ENTER** . Proceed to step 5.
    - To configure *new* custom Live Data, select **Select new PIDs**, then press **ENTER** . The Custom Live Data menu displays. Proceed to step 3.
  - If custom Live Data was not previously selected, the Custom Live Data menu displays. Proceed to step 3.
3. Press **UP**  and **DOWN**  to scroll through the available PIDs. When a PID you wish to display is highlighted, press **ENTER**  (a "checkmark" shows to confirm your selection). Repeat until only the PIDs you want to display are selected.
- To deselect a PID, highlight the PID, then press **ENTER** . The checkmark is removed.
4. When you are finished making your selection(s), press **LD** to continue.
- If *no PIDs* have been selected, an advisory message displays. Press **ENTER**  to return to the Custom Live Data menu.
5. The Scan Tool is now in "Custom Live Data" mode. Only the PIDs you selected are shown.
- To change the current custom Live Data selections, select **Reselect PIDs**, then press **ENTER**  to return to the Custom Live Data menu. Repeat step 3.
6. To exit the "Custom Live Data" mode, press **LD** to return to the Live Data Menu.




## RECORDING (CAPTURING) LIVE DATA

You can record and save several frames of Live Data information for each PID supported by the vehicle in the Scan Tool's memory.

There are two ways that the Scan Tool can record Live Data:




- Record by DTC Trigger
- Record by Manual Trigger






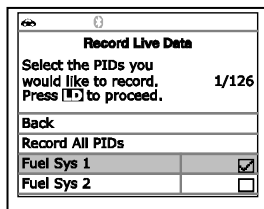
If **LINK**  is pressed at any time while in Live Data mode, any recorded Live Data will be erased from the Scan Tool's memory.


### Record by DTC Trigger

This function automatically records Live Data information when a DTC sets and saves it in the Scan Tool's memory. The recorded (captured) data can be a valuable troubleshooting aid, particularly if you are experiencing a fault that is causing a DTC to set. The Scan Tool can record approximately 100 frames of Live Data.

1. With the Scan Tool in Live Data mode (see VIEWING LIVE DATA on page 37), press and hold the **LD** button until the Live Data Menu displays, then release the **LD** button.
2. Select **Record Live Data**, then press **ENTER** .
  - The Record Live Data Menu displays.
  - If the Scan Tool fails to establish communication with the vehicle, a "Communication Error" message displays.
    - Ensure your vehicle is OBD2 compliant.
    - Verify the connection at the DLC, and verify the ignition is ON.
    - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
    - Press **LINK**  to continue.
3. Select **Record by DTC Trigger**, then press **ENTER** .


- The Select PIDs to Record screen displays.
4. Press **UP**  and **DOWN**  to scroll through the available PIDs. When a PID you wish to record is highlighted, press **ENTER**  (a "checkmark" shows to confirm your selection). Repeat the procedure until only the PIDs you want to record are selected.

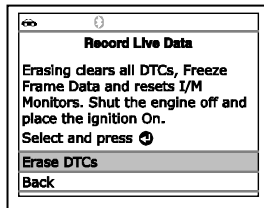




- To deselect a currently selected PID, highlight the PID, then press **ENTER** . The checkmark is removed.

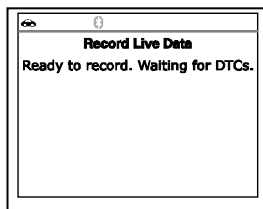
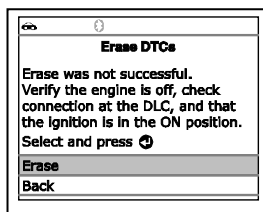


To record all PIDs, select **Record All PIDs**, then press **LD** to continue.

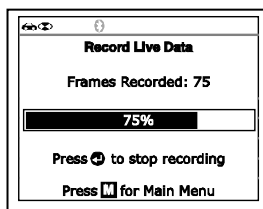
5. When you are finished making your selections, press **LD** to continue.
  - If DTCs are presently stored in the vehicle's computer, an advisory message displays. Select **Erase DTCs**, then press **ENTER** . A "One moment please..." message displays while DTCs are erased from the vehicle's computer.







- If the erase was not successful, an advisory message displays.
  - To retry the erase process, verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on. Select **Erase**, then press **ENTER** .
  - To exit the record function, select **Back**, then press **ENTER**  to return to the Record Live Data menu.
- 6. Put the engine in the operating condition that causes the DTC to set.
  - If necessary, drive the vehicle until you reach the vehicle speed at which the problem occurs.




7. When the Scan Tool detects a fault that causes a DTC to set, it automatically records and saves approximately 100 frames of Live Data information in its memory for each PID selected.



- A progress message shows on the display.
  - You can stop and save recorded Live Data at any time by pressing **ENTER** .
- When recording is complete, a confirmation screen displays. Select **Yes** and press **ENTER**  to playback Live Data (see LIVE DATA PLAYBACK on page 43 for details) or select **No** and press **ENTER**  to return to the Live Data menu, as desired.
- If recording was not successful, an advisory message displays. Press **ENTER**  to return to the Record Live Data menu.



### Record by Manual Trigger




This option lets you select the precise time at which the Live Data recording will occur. Record by Manual Trigger can be a very valuable tool when troubleshooting intermittent problems that do not meet the requirements for a DTC to set. The Scan Tool can record approximately 100 frames of Live Data.

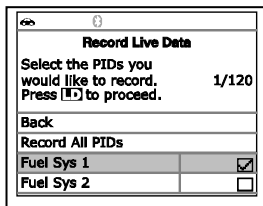
1. With the Scan Tool in Live Data mode (see VIEWING LIVE DATA on page 37), press and hold **LD** until the Live Data Menu displays, then release.
2. Select **Record Live Data**, then press **ENTER** 
  - The Record Live Data Menu displays.


# Live Data Mode

## RECORDING (CAPTURING) LIVE DATA

- If the Scan Tool fails to establish communication with the vehicle, a “Communication Error” message displays.
    - Ensure your vehicle is OBD2 compliant.
    - Verify the connection at the DLC, and verify the ignition is ON.
    - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
    - Press **LINK**  to continue.
3. Select **Record Manually**, then press **ENTER** .

- The Select PIDs to Record screen displays.
4. Press **UP**  and **DOWN**  to scroll through the available PIDs. When a PID you wish to record is highlighted, press **ENTER**  (a “checkmark” shows to confirm your selection). Repeat until only the PIDs you want to record have all been selected.



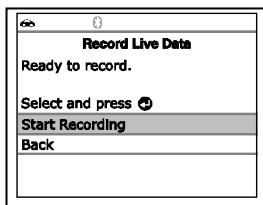
- To deselect a PID, highlight the PID, then press **ENTER** . The checkmark is removed.




To record all PIDs, select **Record All PIDs**, then press **LD** to continue.

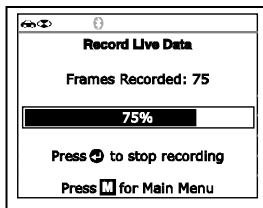
5. When you are finished making your selections, press **LD** to continue.




- The Record Live Data screen displays.
- Highlight **Start Recording**. Put the engine in the operating condition where the problem manifests itself.
  - If necessary, drive the vehicle until you reach the vehicle speed at which the problem occurs.



6. When the problem occurs, press and release **LD**.

- A progress message shows on the display.
  - You can stop and save recorded Live Data at any time by pressing **ENTER** .



- When recording is complete, a confirmation screen displays. Select **Yes** and press **ENTER**  to playback Live Data (see LIVE DATA PLAYBACK on page 43 for details) or select **No** and press **ENTER**  to return to the Live Data menu, as desired.
- If recording was not successful, an advisory message displays. Press **ENTER**  to return to the Record Live Data menu.

### LIVE DATA PLAYBACK

Once Live Data has been recorded, it is saved in the Scan Tool's memory. You can view recorded Live Data immediately after recording by selecting **Yes** from the Record Live Data confirmation screen (see RECORDING (CAPTURING) LIVE DATA on page 39 for more information), or you can view it later using the "Playback" function.


1. With the Scan Tool connected to the vehicle and in Live Data mode (see VIEWING LIVE DATA on page 37), press and hold **LD** until the Live Data Menu displays, then release.



2. Select **Playback Live Data**, then press **ENTER** .



- The Playback Live Data menu displays.



*When you select **Yes** from the Record Live Data confirmation screen, the Scan Tool enters the "Live Data Playback" mode, and the Playback Live Data menu displays.*


3. Select **Continuous Playback** or **Frame by Frame**, as desired, then press **ENTER** .



- Only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow is shown on the display. Press **UP**  and **DOWN** , as necessary, to view all available PID data.


Playback Live Data	
Select and Press  to graph	
Frame 2/34	PID 1/108
Fuel Sys 1	N/A
Fuel Sys 2	N/A
Calc Load	46.7(%)
ECT	117(°F)
Press  for LD Menu	

- When viewing recorded Live Data, look for any irregularities in any of the PID values/signal information (LTFT %, RPM, MAP, TEMP, etc.). If any PIDs are not within specification, or irregularities are detected, follow the procedures in the vehicle's service repair manual to perform additional troubleshooting and repair.


4. When you select **Continuous Playback**, the Scan Tool plays recorded data at a rate of one frame / 15 seconds. When playback is finished, a Playback Complete message displays.

- To play the data back again, select **Continuous Playback** or **Frame by Frame**, as desired, then press **ENTER** .

Playback Live Data	
Continuous Playback is complete.	
Select and press  to graph	
Continuous Playback	
Frame by Frame	
Exit Playback	
Press  for LD Menu	


- To exit Live Data Playback mode and return to Live Data mode, select **Exit Playback**, then press **ENTER** .

5. When **Frame by Frame** is selected, you must scroll the individual frames manually.

- When you have viewed all PID information for the current frame of Live Data, select **Next Frame** or **Previous Frame**, as desired, then press **ENTER** .

## **Live Data Mode**

### **LIVE DATA PLAYBACK**

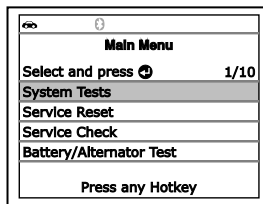
- To exit Live Data Playback mode, select **Exit Playback**, then press **ENTER** .



*If there is no Live Data currently stored in the Scan Tool's memory, an advisory message shows on the display. Press **LD** to exit the "Live Data Playback" mode.*

In addition to retrieving Diagnostic Trouble Codes (DTCs), you can use the Scan Tool to perform additional diagnostic tests, to view diagnostic and vehicle information stored in your vehicle's on-board computer, and to configure the Scan Tool for your particular needs. Additional tests and related functions are accessed through the Main Menu. The following functions are available:

- **System Tests** – Displays the System Test menu, which lets you retrieve and view results for the O2 Sensor Test and OBD Monitor Test, and lets you initiate a test of the vehicle's EVAP system.
- **Service Reset** – Lets you reset the Oil Maintenance Light.
- **Service Check** – Lets you view the current engine oil level and oil life remaining.
- **Battery/Alternator Test** – Performs a check of the vehicle's battery and alternator system to ensure the system is operating within acceptable limits.
- **DLC Locator** – Lets you find the location of the Data Link Connector (DLC) for a specified vehicle.
- **Vehicle Information** – Displays the Vehicle Info menu, which lets you retrieve and view reference information for the vehicle under test.
- **Firmware Version** – Displays the Scan Tool's firmware version.
- **Tool Library** – Displays the Tool Library menu, which provides access to OBD1 and OBD2 DTC libraries and to definitions for Monitor icons and LED indications.
- **Tool Settings** – Displays the Tool Settings menu, which lets you make several adjustments and settings to configure the Scan Tool to your particular needs.




*The **System Tests** and **Vehicle Information** options are shown only when the Scan Tool is in Global OBD2 mode.*

## SYSTEM TEST MENU

Additional tests are accessed through the Mode Test menu. The following functions are available:

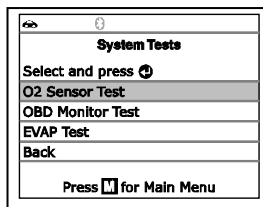
- **O2 Sensor Test** - Retrieves and displays O2 sensor monitor test results from your vehicle's on-board computer.
- **OBD Monitor Test** - Retrieves and displays test results for emission-related powertrain components and systems that are not continuously monitored.
- **EVAP Test** - Performs a leak test for the vehicle's EVAP system.

1. While linked to the vehicle, press **M**.

- The Main Menu displays.
2. Select **System Tests**, then press **ENTER** 



If **System Tests** is not shown on the Main Menu, the System Tests functions are not available for your vehicle.




## O2 Sensor Test

OBD2 regulations require that applicable vehicles monitor and test operation of the oxygen (O<sub>2</sub>) sensors to identify problems that can affect fuel efficiency and vehicle emissions. These tests are performed automatically when engine operating conditions are within predefined limits. Results of these tests are stored in the on-board computer's memory.

The **O<sub>2</sub> Sensor Test** function lets you retrieve and view O<sub>2</sub> sensor monitor test results for the most recently completed tests from your vehicle's on-board computer.

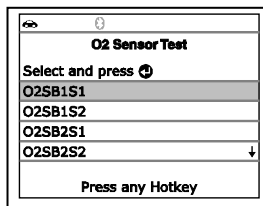


The scan tool does not perform O<sub>2</sub> sensor tests, but retrieves results from the most recently performed O<sub>2</sub> sensor tests from the on-board computer's memory. You may retrieve O<sub>2</sub> sensor test results for only one test of one sensor at any given time.


1. From the System Test menu, select **O<sub>2</sub> Sensor Test**, then press **ENTER** 
2. A "One moment please..." message displays, followed by the select sensor screen.

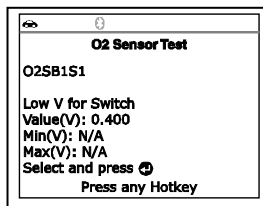




If O<sub>2</sub> sensor test data is not presently stored in the vehicle's computer, an advisory message displays. Press **M** to return to the Main Menu.




If O<sub>2</sub> sensor tests are not supported by the vehicle under test, an advisory message displays. Press **M** to return to the Main Menu.

3. Select the O<sub>2</sub> sensor for which you wish to view test results, then press **ENTER** 
4. When test results have been retrieved, data for the selected sensor test will show on the Scan Tool's display.



5. When you have finished viewing the retrieved test data:
  - To view test results for the next sensor, select **Next**, then press **ENTER** 
  - To return to the Select Sensor screen, select **Back**, then press **ENTER** 




- When you have finished viewing test data for all desired sensors, select **Back**, then press **ENTER**  to return to the System Test menu; or, press **M** to return to the Main Menu.

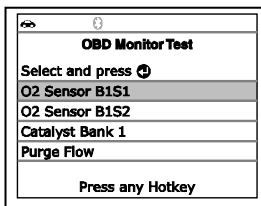
### OBD Monitor Test

The **OBD Monitor Test** function retrieves and displays test results for emission-related powertrain components and systems that are not continuously monitored. The tests available are determined by the vehicle manufacturer.



*The Scan Tool does not perform the OBD monitor test, but retrieves results from the most recently performed tests from the on-board computer's memory. You may retrieve OBD monitor test results for only one test at any given time.*


- From the System Test menu, select **OBD Monitor Test**, then press **ENTER** .
- A "One moment please. . ." message displays, followed by the Select Test screen. (Refer to the vehicle's service repair manual for information related to non-continuous tests.)



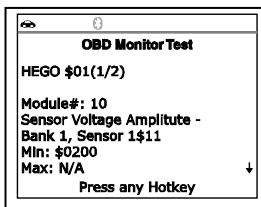
*If OBD monitor test data is not presently stored in the vehicle's computer, an advisory message displays. Press **M** to return to the Main Menu.*




*If OBD monitor tests are not supported by the vehicle under test, an advisory message displays. Press **M** to return to the Main Menu.*

- Select the desired test, then press **ENTER**  to display the test results. The display shows the following information:

- **Test ID** number
- **Module ID** number
- **Component ID** number
- **Min** or **Max** test limit (Only one test limit, either **Min** or **Max**, is shown for any given test.)
- **Test Value** and status



*Status is calculated by the Scan Tool by comparing the **Test Value** against the displayed test limit (either **Min** or **Max**). Status is shown as either **Low**, **High** or **OK**.*

- When you have finished viewing the retrieved test data, select **Back** on the Select Test screen, then press **ENTER**  to return to the System Test menu; or, press **M** to return to the Main Menu.

### EVAP Test

The **EVAP Test** function lets you initiate a leak test for the vehicle's EVAP system.

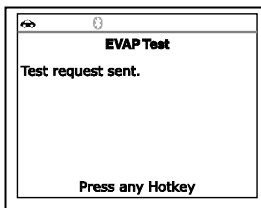
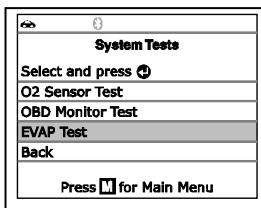


*The Scan Tool does not perform the leak test, but signals to vehicle's on-board computer to initiate the test. The vehicle manufacturer determines the criteria and method for stopping the test once it has been started. Refer to the vehicle's service repair manual to determine the procedures necessary to stop the test.*

1. From the System Test menu, select **EVAP Test**, then press **ENTER**
2. A "One moment please..." message displays.
3. When the EVAP leak test has been initiated by the vehicle's on-board computer, a confirmation message displays. Select **Back**, then press **ENTER** to return to the System Test menu; or, press **M** to return to the Main Menu.

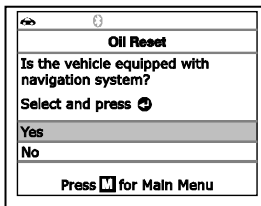
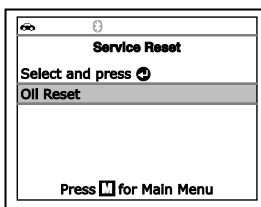


*Some vehicle manufacturers do not allow diagnostic tools or other external devices to control vehicle systems. If the **EVAP Test** is not supported by the vehicle under test, an advisory message displays. Press the **M** button to return to the Main Menu.*



### RESETTING THE OIL MAINTENANCE LIGHT

1. While linked to the vehicle, press **M**.
  - The Main Menu displays.
2. Select **Service Reset**, then press **ENTER** to continue.
  - The Service Reset screen displays.
3. Select **Oil Reset**, then press **ENTER** .
  - The Oil Reset screen displays.
  - If the vehicle under test is equipped with a navigation system, select **Yes**, then press **ENTER** to continue.
  - If the vehicle under test is not equipped with a navigation system, select **No**, then press **ENTER** to continue.





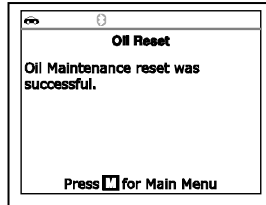
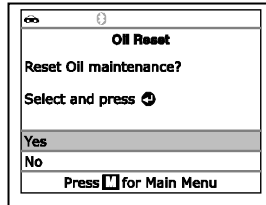
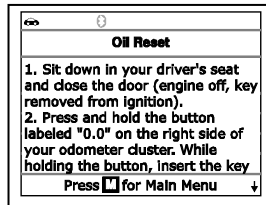
If the Scan Tool cannot reset the Oil Maintenance Light, an “instructional” dialog displays, showing the manual procedures for resetting the indicator light. When finished viewing the instructions, press **M** to return to the Main Menu.

4. The Reset Oil Maintenance Indicator screen displays.

- If you do not wish to proceed with the reset process, select **No**, then press **ENTER** to return to the System Menu.
- If you wish to proceed with the reset process, select **Yes**, then press **ENTER** to continue.

5. When the reset process has completed, a confirmation message displays. Press **M** to return to the Main Menu.

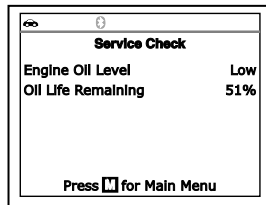
- If the oil reset was not successful, an advisory message displays.
- To perform the oil reset by procedure, select **Yes**, then press **ENTER** . An “instructional” message displays, showing the manual procedures for resetting the indicator light.
- If you do not wish to perform the oil reset by procedure, select **No**, then press **ENTER** to return to the Main Menu.



## PERFORMING A SERVICE CHECK

The **Service Check** function lets you check the current oil level and oil life.








1. While linked to the vehicle, press **M**.
  - The Main Menu displays.
2. Select **Service Check**, then press **ENTER** .
  - The Service Check screen displays.
  - The screen shows the current **Engine Oil Level** and **Oil Life Remaining**.
3. When you have finished viewing the information, press **M** to return to the Main Menu.

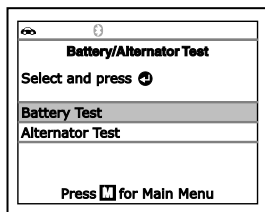


### BATTERY/ALTERNATOR TEST

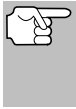
The Scan Tool can perform a check of the vehicle's battery and alternator system to ensure the system is operating within acceptable limits. You can perform a battery check only, or an alternator system (battery and alternator) check.


#### To perform a battery check ONLY:

1. Press **M** and release.
  - The Main Menu displays.
2. Select **Battery/Alternator Test**, then press **ENTER** 
  - The Battery/Alternator Monitor Test displays.
3. Select **Battery Test**, then press **ENTER** 
  - An "instructional" message displays, showing the procedures to prepare the vehicle for the battery check.
4. Prepare the vehicle for the battery check:
  - Turn the engine off.
  - Place the transmission in PARK or NEUTRAL, and set the parking brake.
  - Make a visual check of the battery's condition. If the battery terminals are corroded or other damage is present, clean or replace the battery as appropriate.
  - For "unsealed" batteries, make sure the water level in each cell is above the battery plates.
  - Turn the ignition on. **DO NOT** start the engine.
5. Press **ENTER**  to begin the battery check.
  -  *If the engine is running, an advisory message shows. Turn the engine off, then turn the ignition on. **DO NOT** start the engine. Press **ENTER**  to continue.*
  - An "instructional" message shows.
6. Turn the vehicle's headlights on, then press **ENTER**  to continue.
  - A "countdown" message shows while the battery check is in process.
  - If battery voltage is *less than* 12.1 volts, an advisory message shows. Press **M** to return to the Main Menu. Turn the ignition off and disconnect the Scan Tool from the vehicle. Fully charge the battery, then repeat the battery check.
  - If battery voltage is *greater than* 12.1 volts, an "instructional" message shows.
7. Turn the vehicle's headlights off, then press **ENTER**  to continue.



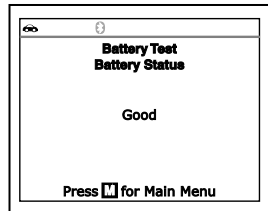
- An “instructional” message shows.
8. Start the vehicle’s engine. Allow the engine to run for several seconds, then turn the engine off. Repeat for a total of three “start/stop” cycles.



*If the Scan Tool did not detect “cranking status” for the vehicle’s engine, an advisory message shows. Press **ENTER**  to repeat the battery check, or, press **M** to return to the Main Menu.*

9. When the battery check is complete, a results screen displays the battery status. The System Status LEDs provide a PASS/FAIL indication, as follows:

- Green = Good
- Yellow = Normal
- Red = Warning/Bad



10. Press **M** to return to the Main Menu.

### To perform a charging system check:

1. Press **M** and release.


- The Main Menu displays.

2. Select **Battery/Alternator Monitor**, then press **ENTER** .

- The Battery/Alternator Test Menu displays.

3. Select **Alternator Monitor**, then press **ENTER** .

- An “instructional” message shows.

4. Start and warm the engine to normal operating temperature. Turn on the headlights. Press **ENTER**  to continue.

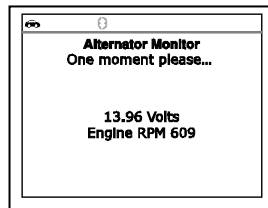
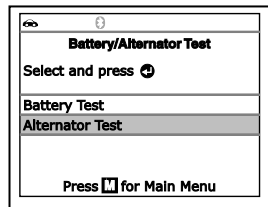
- An “instructional” message shows.

5. Press the accelerator pedal to raise engine speed to 2000 RPM, and maintain the engine speed.

- When engine speed is within the required range, the alternator test begins. A progress screen shows.
- When the “countdown” timer expires, an “instructional” message shows.

6. Turn the vehicle’s headlights off, and return the engine to idle speed.

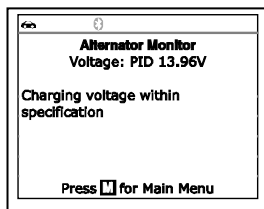
- A “One moment please...” message displays while the test results are retrieved.







# Additional Tests

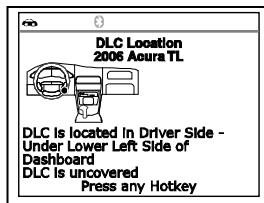
## USING THE DLC LOCATOR - VIEWING VEHICLE INFORMATION

- When the alternator check is complete, a results screen shows charging system voltage and indicates whether or not the charging system is within acceptable limits. The System Status LEDs provide a PASS/FAIL indication, as follows:
  - Green = System within limits
  - Yellow = Over charging or under charging
  - Red = Excessive over charging or under charging
  - If the alternator voltage is less than 9 V, the red, yellow and green SYSTEM STATUS LEDs will flash on and off.
- Press **M** to return to the Main Menu.



## USING THE DLC LOCATOR

- Select **DLC Locator** in the **Main Menu**, then press **ENTER** 
  - The Select Vehicle Model Year screen displays.
- Select the desired vehicle model year, then press **ENTER** 
  - The Select Vehicle Manufacturer screen displays.
- Select the desired vehicle manufacturer, then press **ENTER** 
  - The Select Vehicle Model screen displays.
- Select the desired model, then press **ENTER** 
  - The DLC Location screen for the selected vehicle displays.
  - The DLC Location screen shows the selected vehicle make and model, a description of the DLC location and whether the DLC is "covered" or "uncovered," and includes a picture of the DLC location.
- When you have finished viewing the DLC location, press any hotkey to exit the DLC Locator.



## VIEWING VEHICLE INFORMATION

The **Vehicle Information** function offers three options for retrieving reference information for the vehicle under test; **Vehicle ID**, **Available Modules** and **IPT** (In-Use Performance Tracking).

### Retrieving Vehicle ID Information



*The Vehicle ID function is applicable to model year 2000 and newer OBD2-compliant vehicles.*

The Scan Tool can retrieve a list of information (provided by the vehicle manufacturer), unique to the vehicle under test, from the vehicle's on-board computer. This information may include:


- The vehicle's VIN number
- The control module identification number
- The vehicle's calibration ID(s). These IDs uniquely identify the software version(s) for the vehicle's control module(s).
- The Vehicle's Calibration Verification Number(s) (CVNs) required by OBD2 regulations. CVNs are used to determine if emission-related calibrations for the vehicle under test have been changed. One or more CVNs may be returned by the vehicle's computer.

1. With the Scan Tool in OBD2 mode, press **M**.

- The Main Menu displays.

2. Select **Vehicle Information**, then press **ENTER** .

- The Vehicle Information menu displays.

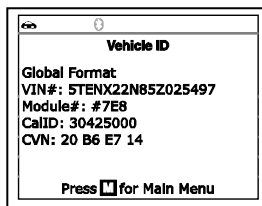
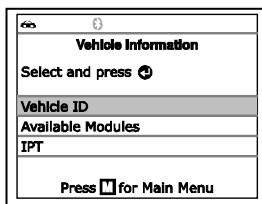
3. Select **Vehicle ID**, then press **ENTER** .



*The first time the **Vehicle ID** function is used, it may take several minutes to retrieve the information from the vehicle's computer.*

4. When the retrieval process is completed, the vehicle ID information displays.

5. When you have finished viewing the retrieved vehicle ID information, press **M** to return to the Main Menu.



### Viewing Available Modules

The Scan Tool can retrieve a list of modules supported by the vehicle under test.

1. With the Scan Tool in OBD2 mode, press **M**.

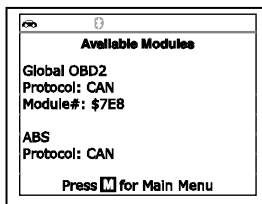
- The Main Menu displays.

2. Select **Vehicle Information**, then press **ENTER** .

- The Vehicle Information menu displays.

3. Select **Available Modules**, then press **ENTER** .


4. When the retrieval process is completed, a complete list of modules supported by the vehicle under test displays.




- When you have finished viewing the list of available modules, press **M** to return to the Main Menu.

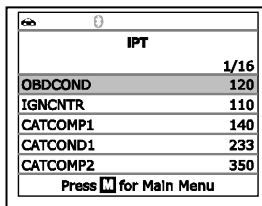
### Viewing In-use Performance Tracking (IPT)

The Scan Tool can retrieve In-use Performance Tracking (IPT) statistics for monitors supported by the vehicle under test. Two values are returned for each monitor; the number of times that all conditions necessary for a specific monitor to detect a malfunction have been encountered (XXXCOND), and the number of times that the vehicle has been operated under the specific conditions for the monitor (XXXCOMP). Statistics are also provided for the number of times the vehicle has been operated in OBD monitoring conditions (OBDCOND), and the number of times the vehicle's engine has been started (IGNCNTR).

- With the Scan Tool in OBD2 mode, press **M**.
  - The Main Menu displays.
- Select **Vehicle Information**, then press the **ENTER**  button.
  - The Vehicle Information menu displays.

- Select **IPT**, then press **ENTER** .
- When the retrieval process is completed, the In-use Performance Tracking statistics for the vehicle under test display.

- If In-use Performance Tracking is not available for your vehicle, an advisory message shows on the Scan Tool's display. Press **M** to return to the Main Menu.




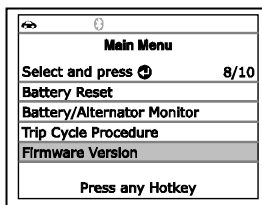
	1/16
OBDCOND	120
IGNCNTR	110
CATCOMP1	140
CATCOND1	233
CATCOMP2	350


Press **M** for Main Menu

- When you have finished viewing the statistics, press **M** to return to the Main Menu.

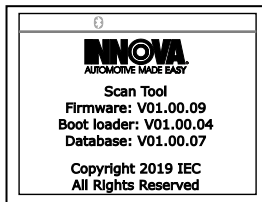
## VIEWING THE FIRMWARE VERSION

- Select **Firmware Version** in the Main Menu, then press **ENTER** 
  - The Firmware Version screen displays for four seconds.
  - The screen shows the Scan Tool's current firmware version, bootloader version and database version.
- The display returns to the Main Menu.



Main Menu	
Select and press 	8/10
Battery Reset	
Battery/Alternator Monitor	
Trip Cycle Procedure	
Firmware Version	

Press any Hotkey



**NOVA**  
AUTOMOTIVE MADE EASY


Scan Tool  
Firmware: V01.00.09  
Boot loader: V01.00.04  
Database: V01.00.07

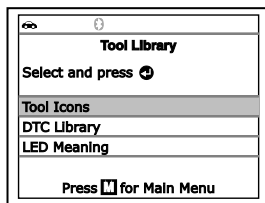
Copyright 2019 IEC  
All Rights Reserved



## THE TOOL LIBRARY




The Tool Library contains valuable reference information for the Scan Tool. The following functions are available:

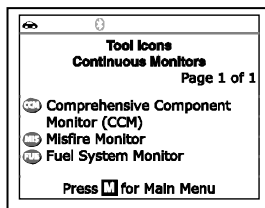
- **Tool Icons** – Shows the full names for the **I/M MONITOR STATUS** icons shown and descriptions of informational icons on the Scan Tool's display.
  - **DTC Library** – Provides access to libraries of OBD2 DTC definitions.
  - **LED Meaning** – Provides descriptions of the meaning of the Scan Tool **SYSTEM STATUS** LEDs.
1. While linked to the vehicle, press **M**.
    - The Main Menu displays.
  2. Select **Tool Library**, then press **ENTER** 
    - The Tool Library menu displays.





### Viewing Tool Icon Descriptions

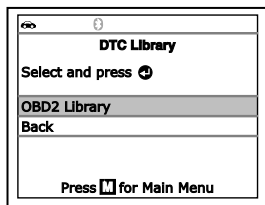
The **I/M MONITOR STATUS** icons on the Scan Tool's LCD display provide an indication of the "Completed / Not Complete" status for all I/M Monitors supported by the vehicle under test. The **Tool Icons** function displays the full name for each Monitor icon, as well as descriptions of the meanings of other informational icons shown on the Scan Tool's display.






1. From the Tool Library menu, select **Tool Icons**, then press **ENTER** 
  - The Tool Icons screen displays.
  - The screen shows a list of the 15 Monitor icons, along with the full name for each icon, as well as descriptions of the meanings of other informational icons. Use the **UP**  and **DOWN**  buttons, as necessary, to scroll the list.
2. When you have finished viewing the tool icon descriptions, press **M** to return to the Main Menu.

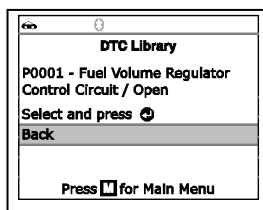
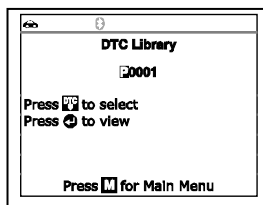
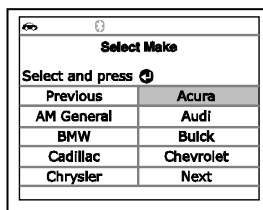



### Using the DTC Library

1. From the Tool Library menu, select **DTC Library**, then press **ENTER** 
  - The Select Library screen displays.
2. Select **OBD2 Library**, then press **ENTER** .




- The Select Manufacturer screen displays.
3. Select the desired vehicle manufacturer, then press **ENTER** 
    - The Enter DTC screen displays. The screen shows the code "P0001," with the "P" highlighted.
  4. Use the **UP**  and **DOWN**  buttons, as necessary, to scroll to the desired DTC type (P=Powertrain, U=Network, B=Body, C=Chassis), then press the **DTC/FF** button.
    - The selected character displays solid, and the next character is highlighted.
  5. Select the remaining digits in the DTC in the same way. When you have selected all the DTC digits, press **ENTER**  to view the DTC definition.
  6. When you have finished viewing the DTC definition, highlight **Back**, then press **ENTER**  to return to the Enter DTC screen and enter additional DTCs; or, press **M** to return to the Main Menu.

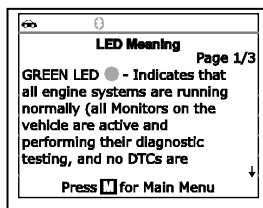


If a definition for the DTC you entered is not available, an advisory message shows. Highlight **Back**, then press **ENTER**  to return to the Enter DTC screen and enter additional DTCs; or, press **M** to return to the Main Menu.

## Viewing LED Meaning

The **SYSTEM STATUS** LEDs on the Scan Tool provide a visual indication of the I/M Readiness status of the vehicle under test. The **LED Meaning** function provides a description of the meanings of the green, yellow and red **SYSTEM STATUS** LEDs.

1. From the Tool Library menu, select **LED Meaning**, then press **ENTER** 
  - The LED Meaning screen displays.
  - The screen provides a description of the meanings of the green, yellow and red **SYSTEM STATUS** LEDs.
2. When you have finished viewing the LED meanings, press **M** to return to the Main Menu.



### ADJUSTMENTS AND SETTINGS

The Scan Tool lets you make several adjustments and settings to configure the Scan Tool to your particular needs. The following adjustments and settings are available:

- **Adjust Brightness:** Adjusts the brightness of the display screen.
- **Audible Tone:** Turns the Scan Tool's audible tone "on" and "off." When turned "on," a tone sounds each time a button is pressed.
- **Footer Messages:** Turns the navigational "footers" at the bottom of most display screens "on" and "off."
- **Hotkey Legend:** Shows functional descriptions for the Scan Tool's hotkeys.
- **Language Selection:** Sets the display language for the Scan Tool to English, French or Spanish.
- **Unit of Measurement:** Sets the Unit of Measurement for the Scan Tool's display to USA or metric.

#### To enter the Tool Settings mode:

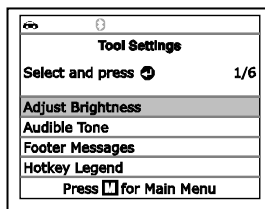
1. While linked to the vehicle, press and release **M**.

- The Main Menu displays.


2. Select **Tool Settings**, then press **ENTER** .

- The Tool Setting menu displays.




3. Make adjustments and settings as follows.

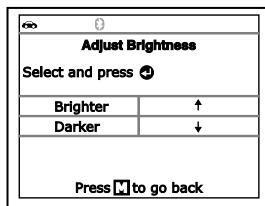


#### Adjusting Display Brightness

1. Select **Adjust Brightness** in the Tool Settings menu, then press **ENTER** .


- The Adjust Brightness screen displays.

2. Press **UP**  and **DOWN**  to make the display lighter or darker, then press **ENTER**  to save your changes.




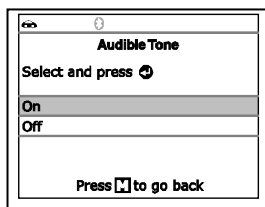
To return to the Tool Settings menu without making changes, press **M**.

#### Enabling/Disabling the Audible Tone

1. Select **Audible Tone** in the Tool Settings menu, then press **ENTER** .

- The Audible Tone screen displays.

2. Select **On** or **Off** as desired, then press **ENTER**  to save your changes.

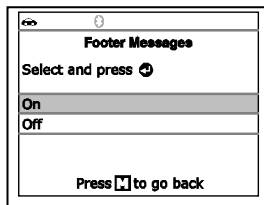




To return to the Tool Settings menu without making changes, press **M**.

### Enabling/Disabling Navigational Footers

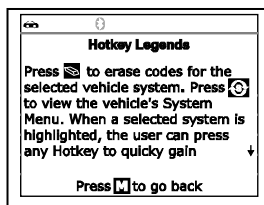
1. Select **Footer Messages** in the Tool Settings menu, then press **ENTER** .
  - The Footer Messages screen displays.
2. Select **On** or **Off** as desired, then press **ENTER** to save your changes.



To return to the Tool Settings menu without making changes, press **M**.

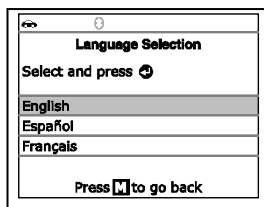
### Viewing the Hotkey Legend

1. Select **Hotkey Legend** in the Tool Settings menu, then press **ENTER** .
  - The Hotkey Legend screen displays.
  - The screen shows a functional description of each of the Scan Tool's hotkeys.
2. When you have finished viewing the Hotkey Legend, press **ENTER** to return to the Tool Settings menu.



### Selecting the Display Language

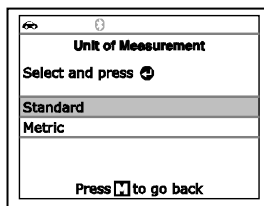
1. Select **Language Selection** in the Tool Settings menu, then press **ENTER** .
  - The Language Selection screen displays.
2. Select the desired display language, then press **ENTER** to save your changes.



To return to the Tool Settings menu without making changes, press **M**.

### Setting the Unit of Measurement

1. Select **Unit of Measurement** in the Tool Settings menu, then press **ENTER** .
  - The Unit of Measurement screen displays.



2. Select the desired unit of measurement, then choose **Save** to save your changes.



*To return to the Tool Settings menu without making changes, press **M**.*

#### **Exiting the MENU Mode**

- Press **M** to return to the Main Menu.



## LIMITED ONE YEAR WARRANTY

The Manufacturer warrants to the original purchaser that this unit is free of defects in materials and workmanship under normal use and maintenance for a period of one (1) year from the date of original purchase.

If the unit fails within the one (1) year period, it will be repaired or replaced, at the Manufacturer's option, at no charge, when returned prepaid to the Service Center with Proof of Purchase. The sales receipt may be used for this purpose. Installation labor is not covered under this warranty. All replacement parts, whether new or remanufactured, assume as their warranty period only the remaining time of this warranty.

This warranty does not apply to damage caused by improper use, accident, abuse, improper voltage, service, fire, flood, lightning, or other acts of God, or if the product was altered or repaired by anyone other than the Manufacturer's Service Center.

The Manufacturer, under no circumstances shall be liable for any consequential damages for breach of any written warranty of this unit. This warranty gives you specific legal rights, and you may also have rights, which vary from state to state. This manual is copyrighted with all rights reserved. No portion of this document may be copied or reproduced by any means without the express written permission of the Manufacturer. **THIS WARRANTY IS NOT TRANSFERABLE.** For service, send via U.P.S. (if possible) prepaid to Manufacturer. Allow 3-4 weeks for service/repair.

## SERVICE PROCEDURES

If you have any questions, require technical support or information on UPDATES and OPTIONAL ACCESSORIES, please contact your local store, distributor or the Service Center.

### **USA & Canada:**

(800) 544-4124 (6:00 AM-6:00 PM PST, Monday through Saturday)

**All others:** (714) 241-6802 (6:00 AM-6:00 PM PST, Monday through Saturday)

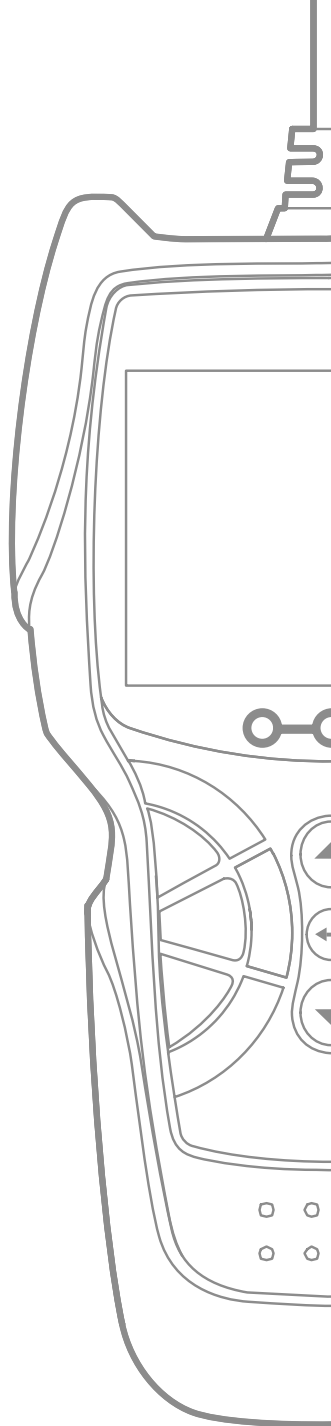
**FAX:** (714) 241-3979 (24 hr.)

**Web:** [www.innova.com](http://www.innova.com)



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