ZR11

OBD2
Code Reader

OWNER'S MANUAL

The easiest and best way to troubleshoot 1996 and newer OBD2 vehicles!

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IMPORTANT SAFETY INFORMATION

⚠WARNING

Read all safety warnings and all instructions.
Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

1. Operating a vehicle indoors CAN KILL YOU IN MINUTES. Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell. NEVER operate vehicle inside a home or garage, EVEN IF doors and windows are open. Only use OUTSIDE and far away from windows, doors, and vents.
2. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to heart pacemaker could cause pacemaker interference or pacemaker failure. Caution is necessary when near coil, spark plug cables, or distributor of running engine. Engine should be off during distributor adjustment.
3. Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts.
4. Put the transmission in PARK (for automatic transmission) or NEUTRAL (for manual transmission) and make sure the parking brake is engaged.
5. Put blocks in front of and behind the drive wheels.
6. Read vehicle service manual before inspecting, maintaining, or repairing a vehicle.
7. Wear ANSI-approved safety goggles.
8. Never leave the vehicle unattended while running tests.
9. Keep a fire extinguisher suitable for gasoline/chemical/electrical fires nearby.
10. Don't connect or disconnect any test equipment while the ignition is on or the engine is running.
11. This product is not a toy. Keep it out of reach of children.
12. Keep the Scan Tool dry, clean, free from oil, water or grease. Use a mild detergent on a clean cloth to clean the outside of the Scan Tool, when necessary.
13. The warnings, precautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

SAVE THESE INSTRUCTIONS.

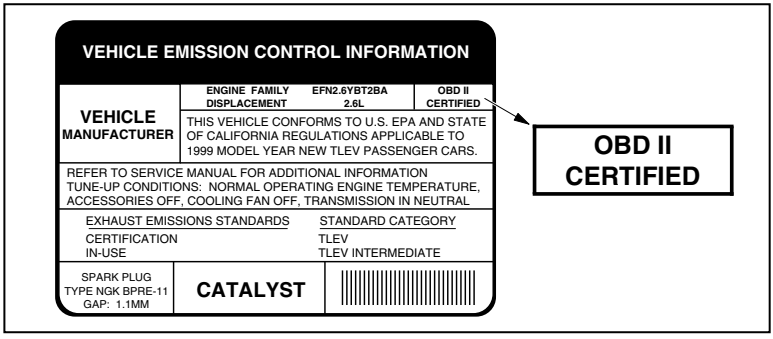
VEHICLES COVERED

All 1996 and newer vehicles (cars and light trucks) sold in the United States are OBD2 compliant. Coverage for new model vehicles may be limited and will be available once released by the automaker. Availability is typically 12 to 24 months after the release of the model year.

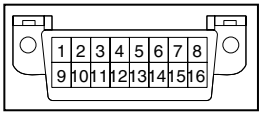
Federal law requires that all 1996 and newer cars and light trucks sold in the United States must be OBD2 compliant; this includes all Domestic, Asian and European vehicles.

Some 1994 and 1995 vehicles are OBD2 compliant. To find out if a 1994 or 1995 vehicle is OBD2 compliant, check the following:

1. **The Vehicle Emissions Control Information (VECI) Label**. This label is located under the hood or by the radiator of most vehicles. If the vehicle is OBD2 compliant, the label will state "**OBD II Certified**."



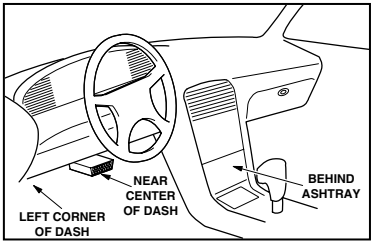
2. Government Regulations require that all OBD2 compliant vehicles **must** have a "common" sixteen-pin **Data Link Connector (DLC)**.



Some 1994 and 1995 vehicles have 16-pin connectors but are not OBD2 compliant. Only those vehicles with a Vehicle Emissions Control Label stating "OBD II Certified" are OBD2 compliant.

Data Link Connector (DLC) Location

The 16-pin DLC is usually located under the instrument panel (dash), within 12 inches (300 mm) of center of the panel, on the driver's side of most vehicles. It should be easily accessible and visible from a kneeling position outside the vehicle with the door open.



On some Asian and European vehicles the DLC is located behind the "ashtray" (the ashtray must be removed to access it) or on the far left corner of the dash. If the DLC cannot be located, consult the vehicle's service manual for the location.

BATTERY REPLACEMENT

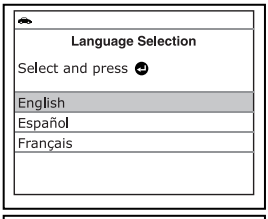
Replace batteries when the battery symbol is visible on display and/or the 3 LEDS are all lit and no other data is visible on screen.

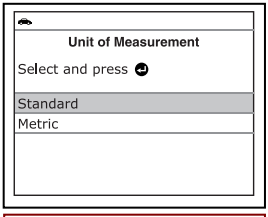
1. Locate the battery cover on the back of the Code Reader.
2. Slide the battery cover off (use your fingers).
3. Replace batteries with three AA-size batteries (for longer life, use Alkaline-type batteries).
4. Reinstall the battery cover on the back of the Code Reader.

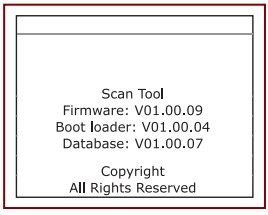
Adjustments

The first time the Code Reader is turned on, you must select the desired display language (English, French or Spanish) and unit of measurement (Standard or metric) as follows:

1. Press the **POWER/LINK** button to turn the Code Reader "ON."
   - The Select Language screen displays.
2. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired display language.
3. When the desired display language is selected, press the **ENTER** button to confirm your selection.
   - The Select Unit screen displays.
4. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired unit of measurement.
5. When the desired unit of measurement is selected, press the **ENTER** button to confirm your selection.
   - The Code Reader's Firmware Version screen displays.







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, SETTINGS AND LANGUAGE" on page 76 for further instructions.

CONTROLS AND INDICATORS

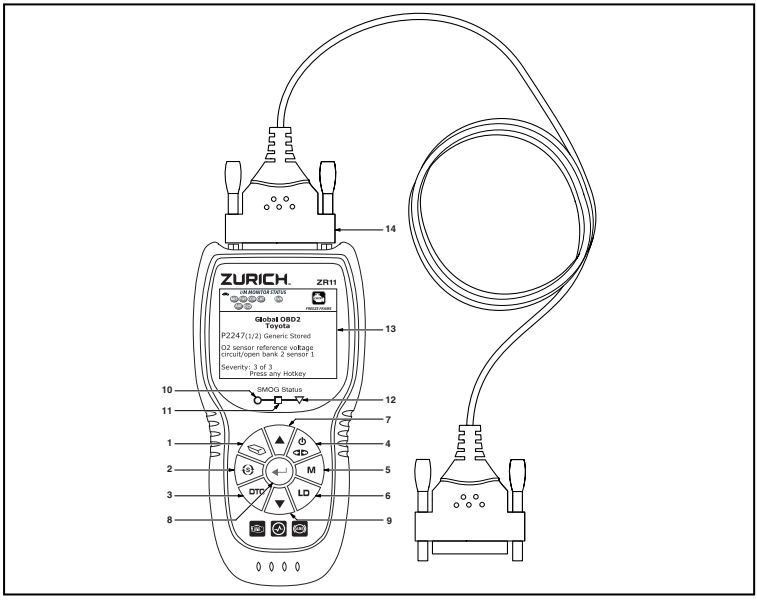


Figure 1. Controls and Indicators

See Figure 1 for the locations of items 1 through 20, 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. **POWER/LINK button** - When the Code Reader IS NOT connected to a vehicle, turns the Code Reader "**On**" and "**Off**". When the Code Reader is connected to a vehicle, links the Code Reader to the vehicle's PCM to retrieve diagnostic data from the computer's memory.

5. **M** button – When pressed, displays the Main Menu.

6. **LD button** – When pressed while linked to a vehicle, places the Code Reader in Live Data mode.

7. **UP** button – When in MENU mode, scrolls UP through the menu and submenu selection 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 and submenu selection 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 Code Reader’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, Code Reader functions and Monitor status information. See **DISPLAY FUNCTIONS** (page 9) for more details.
14. **CABLE** - Connects the Code Reader to the vehicle’s Data Link Connector (DLC).

DISPLAY FUNCTIONS

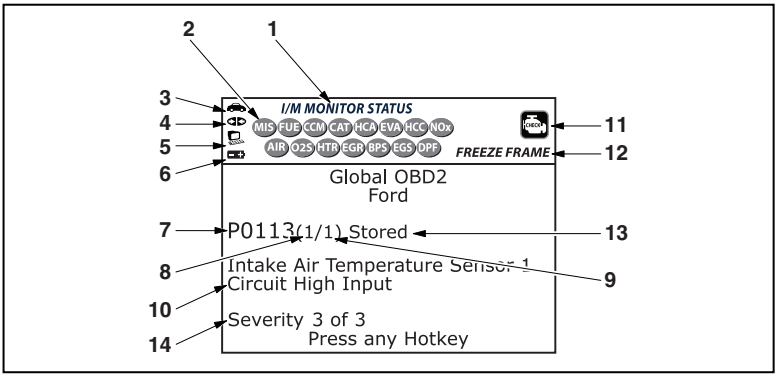


Figure 2. Display Functions

See Figure 2 for the locations of items 1 through 14, 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). When a Monitor icon is solid green, it indicates that the associated Monitor has completed its diagnostic testing. When a Monitor icon is flashing red, it indicates that the vehicle supports the associated Monitor, but the Monitor has not yet run its diagnostic testing.
3. **Vehicle icon** - Indicates whether or not the Code Reader is being properly powered through the vehicle's Data Link Connector (DLC). A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
4. **Link icon** - Indicates whether or not the Code Reader is communicating (linked) with the vehicle's on-board computer. When visible, the Code Reader is communicating with the computer. If the Link icon is not visible, the Code Reader is not communicating with the computer.
5. **Computer icon** - When this icon is visible it indicates that the Code Reader is linked to a personal computer.
6. **Code Reader Internal Battery icon** - When visible, indicates the Code Reader batteries are "low" and should be replaced. If the batteries are not replaced when the battery symbol is "on", all 3 LEDs will light up as a last resort indicator to warn you that the batteries need replacement. No data will be displayed on screen when all 3 LEDs are lit.

7. **DTC Display Area** - Displays the Diagnostic Trouble Code (DTC) number.
8. **Code Number Sequence** - The Code Reader 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.

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

MIL icon ABS icon

12. **FREEZE FRAME icon** - Indicates that there is Freeze Frame data from "Priority Code" (Code #1) stored in the vehicle's computer memory.
13. **Code type** - Indicates the type of code being displayed; **Generic Stored**, **Generic Pending**, **Generic permanent**, etc.
14. **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.

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 <u>has</u> 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 <u>has not</u> 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.

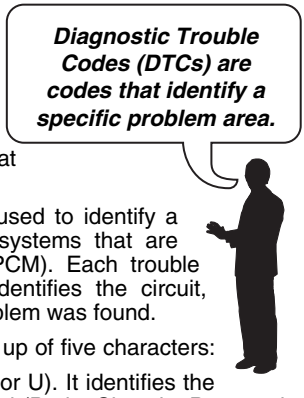
- **OBD2 Drive Cycle** - An OBD2 Drive Cycle is an extended set of driving procedures that takes into consideration the various types of driving conditions encountered in real life. These conditions may include starting the vehicle when it is cold, driving the vehicle at a steady speed (cruising), accelerating, 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).

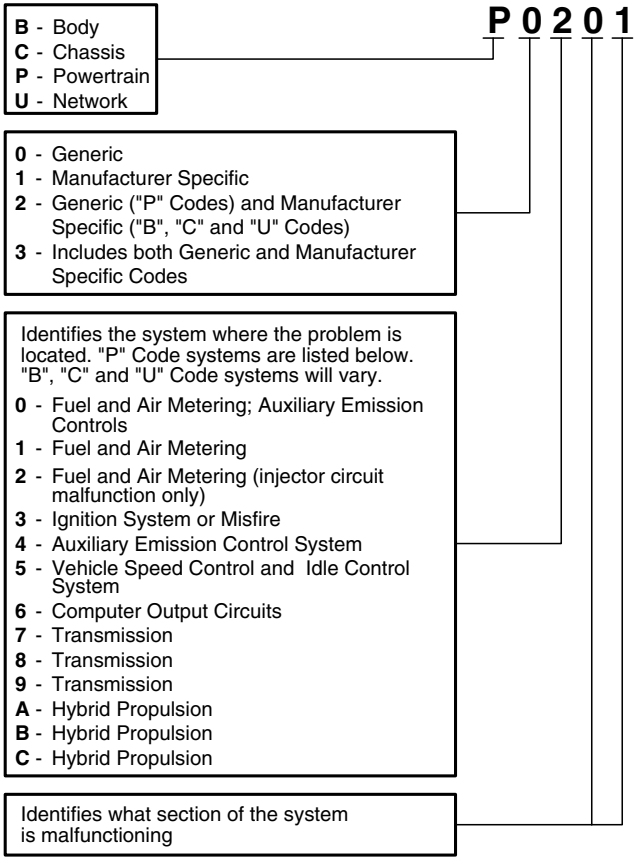
Generic DTCs *are codes that are used by all vehicle manufacturers. The standards for generic DTCs, as well as their definitions, are set by the Society of Automotive Engineers (SAE).*

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 46, 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

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:

CCM Comprehensive Component Monitor (CCM)

MIS Misfire Monitor

FUE 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:

O2S Oxygen Sensor Monitor

HTR Oxygen Sensor Heater Monitor

CAT Catalyst Monitor

HCA Heated Catalyst Monitor

EGR EGR System Monitor

EVA EVAP System Monitor

AIR 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

HCC NMHC Monitor

NOx NOx Adsorber Monitor

BPS Boost Pressure System Monitor

EGS Exhaust Gas Sensor Monitor

DPF PM Filter Monitor

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

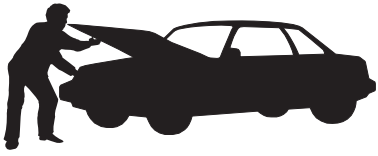
D. Number of trips needed, with no faults present, to erase a Pending DTC

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

Name of Monitor	A	B	C	D	E	F
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

BEFORE YOU BEGIN



Mechanical problems such as low oil level or damaged hoses, wiring or electrical connectors can cause poor engine performance and may also cause a fault code to set. Fix any known mechanical problems before performing any test. See your vehicle's service manual or a mechanic for more information.

Check the following areas **before** starting any test:

- Check the engine oil, power steering fluid, transmission fluid (if applicable), engine coolant and other fluids for proper levels. Top off low fluid levels if needed.
- Make sure the air filter is clean and in good condition. Make sure all air filter ducts are properly connected. Check the air filter ducts for holes, rips or cracks.
- Make sure all engine belts are in good condition. Check for cracked, torn, brittle, loose or missing belts.
- Make sure mechanical linkages to engine sensors (throttle, gearshift position, transmission, etc.) are secure and properly connected. See your vehicle's service manual for locations.
- Check all rubber hoses (radiator) and steel hoses (vacuum/fuel) for leaks, cracks, blockage or other damage. Make sure all hoses are routed and connected properly.
- Make sure all spark plugs are clean and in good condition. Check for damaged, loose, disconnected or missing spark plug wires.
- Make sure the battery terminals are clean and tight. Check for corrosion or broken connections. Check for proper battery and charging system voltages.
- Check all electrical wiring and harnesses for proper connection. Make sure wire insulation is in good condition, and there are no bare wires.
- Make sure the engine is mechanically sound. If needed, perform a compression check, engine vacuum check, timing check (if applicable), etc.

CODE RETRIEVAL PROCEDURE

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

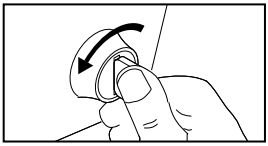
Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed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

Check your vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 15 for details.

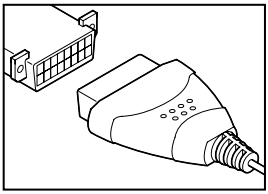
***ALWAYS** observe safety precautions whenever working on a vehicle. See IMPORTANT SAFETY INFORMATION on page 1 for more information.*

1. Turn the ignition off.

2. Locate the vehicle's 16-pin Data Link Connector (DLC). See page 2 for connector location.



Some DLCs have a plastic cover that must be removed before connecting the Code Reader cable connector.



*If the Code Reader is ON, turn it OFF by pressing the **POWER/LINK** button BEFORE connecting the Code Reader to the DLC.*

3. Connect the Code Reader cable connector 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° and try again.
- If you still have problems, check the DLC on the vehicle and on the Code Reader. Refer to your vehicle's service manual to properly check the vehicle's DLC.

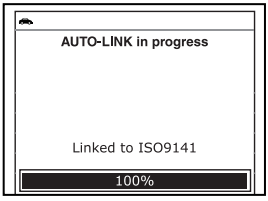
4. Turn the ignition on. **DO NOT** start the engine.

5. When the Code Reader's cable connector is properly connected to the vehicle's DLC, the unit automatically turns ON.

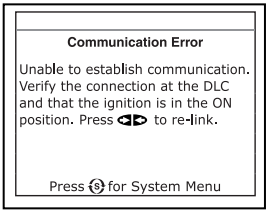
- If the unit does not power on automatically when connected to the vehicle's DLC connector, it usually indicates there is no power present at the vehicle's DLC connector. Check your fuse panel and replace any burned-out fuses.

- 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.

6. The Code Reader will automatically start a check of the vehicle's computer to determine which type of communication protocol it is using. When the Code Reader identifies the computer's communication protocol, a communication link is established.

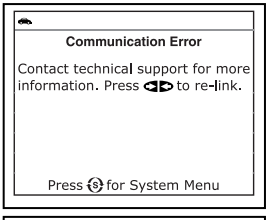


- If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.



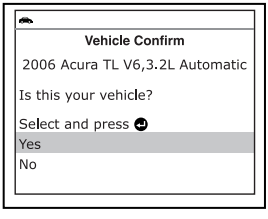
  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.
  - Verify the connection at the DLC, and verify the ignition is ON.
  - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
  - Press the **POWER/LINK** button to continue.

- If the Code Reader **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 Code Reader.
  - Contact Technical Support for assistance.

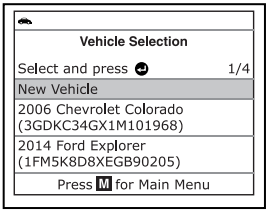
7. If the Code Reader can decode the Vehicle Identification Number (VIN) for the vehicle under test, the Vehicle Information screen displays.



- If the information shown is correct for the vehicle under test, use the **UP** and **DOWN** buttons, as necessary, to highlight **Yes**, then press the **ENTER** button. Proceed to step **10**.
- If the information shown is not correct for the vehicle under text, or if you wish to manually select the vehicle, use **UP** and **DOWN** buttons, as necessary, to highlight **No**, then press the **ENTER** button. Proceed to step **8**.

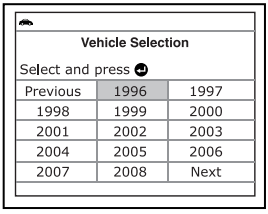
- If the Code Reader **cannot** decode the Vehicle Identification Number (VIN) for the vehicle under test, the Select Vehicle screen displays. Proceed to step **8**.

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, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle, then press the **ENTER** ↵ button. Proceed to step **10**.

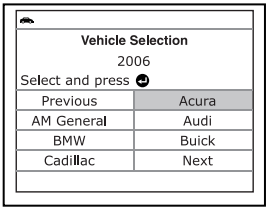
- To select a new vehicle, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **New Vehicle**, then press the **ENTER** ↵ button. Proceed to step **9**.



9. When **New Vehicle** is chosen from the Select Vehicle screen, the Select Year screen displays.

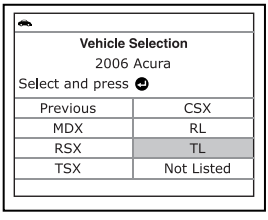
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle model year, then press the **ENTER** ↵ button to continue. If necessary, select **Next** to view additional options.

  - The Select Make screen displays.



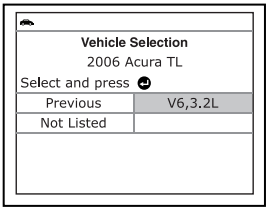
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle make, then press the **ENTER** ↵ button to continue. If necessary, select **Next** to view additional options.

  - The Select Model screen displays.

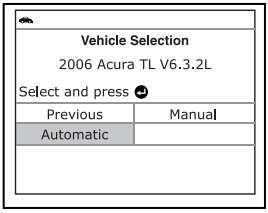


- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle model, then press the **ENTER** ↵ button to continue. If necessary, select **Next** to view additional options.

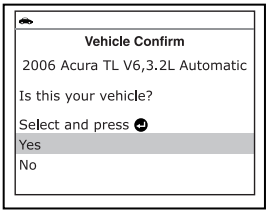
  - The Select Engine screen displays.



- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle engine size, then press the **ENTER** ↵ button to continue. If necessary, select **Next** to view additional options.
  - The Select Transmission screen displays.



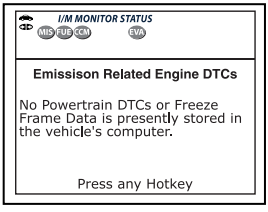
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired transmission type, then press the **ENTER** ↵ button to continue. If necessary, select **ENTER** ↵ to view additional options. The Vehicle Information screen displays.



- If the information shown is correct for the vehicle under test, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button. Proceed to step **10**.
- If the information shown is not correct for the vehicle under text, or if you wish to reselect the vehicle, use **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to return to the Select Year screen.

10. After approximately 10~60 seconds, the Code Reader will **retrieve** and **display** any Diagnostic Trouble Codes, Monitor Status and Freeze Frame Data retrieved from the vehicle's computer memory.

- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, the message "No Powertrain DTCs or Freeze Frame Data presently stored in the vehicle's computer."

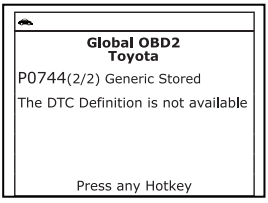


- The Code Reader is capable of retrieving and storing up to 32 codes in memory, for immediate or later viewing.

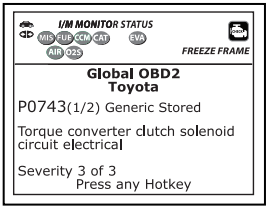
11. To read the display:

Refer to DISPLAY FUNCTIONS on page 6 for a description of display elements.

- Press the **DTC/FF** button to scroll to the next DTC.



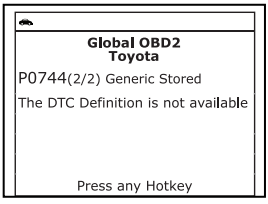
- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Code Reader is linked to (communicating with) the vehicle's computer.
- The I/M Monitor Status icons indicate the type and number of Monitors the vehicle supports, and provides indications of the current status of the vehicle's Monitors. A **solid** Monitor icon indicates the associated Monitor **has run** and completed its testing. A **blinking** Monitor icon indicates the associated Monitor **has not** run and completed its testing.
- The upper left hand corner of the display shows the DTC and number of the code currently being displayed and the total number of codes retrieved. The upper right hand corner shows whether or not the displayed code commanded the MIL on. If the code being displayed is a PENDING code, the PENDING icon is shown. If the code being displayed is a PERMANENT code, the PERMANENT icon is shown.



- The Diagnostic Trouble Code (DTC) and related code definition are shown in the lower section of the display.

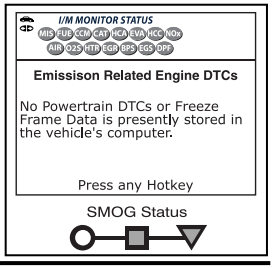
In the case of long code definitions, a small arrow is shown in the upper/lower right-hand corner of the Code Reader display area to indicate the presence of additional information. Use the ▲ and ▼ buttons, as necessary, to view the additional information.

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



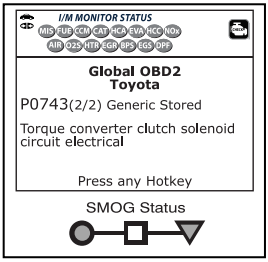
12. Read and interpret Diagnostic Trouble Codes/system condition using the display and the green, yellow and red LEDs.

- **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.

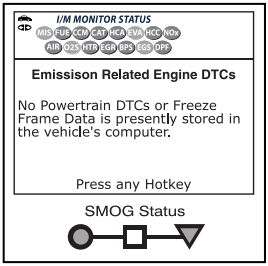


- **Yellow LED** – Indicates one of the following conditions:

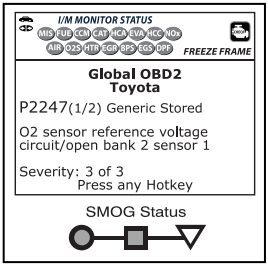
A. A PENDING CODE IS PRESENT – If the yellow LED is illuminated, it may indicate a Pending code is present. Check the Code Reader's display for confirmation. A Pending code is confirmed by the presence of a numeric code and the word PENDING on the Code Reader's display.



B. MONITOR NOT RUN STATUS – If the Code Reader's 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 Code Reader's 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.



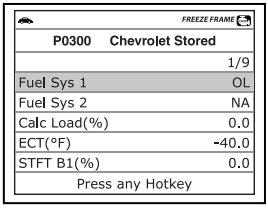
- **Red LED** – Indicates there is a problem with one or more of the vehicle's systems. The red LED is also used to indicate that DTC(s) are present (displayed on the Code Reader's screen). In this case, the Malfunction Indicator (Check Engine) lamp on the vehicle's instrument panel will be illuminated.



- 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 Code Reader 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 the **DTC/FF** button, as necessary.

- Each time the **DTC/FF** button is pressed and released, the Code Reader 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.

*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 Code Reader 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 the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.

15. Determine engine system(s) condition by viewing the Code Reader's display for any retrieved Diagnostic Trouble Codes, code definitions and Freeze Frame data, interpreting the green, yellow and red LEDs.

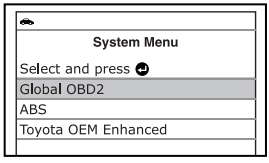
- If DTC's were retrieved and you are going to perform the repairs yourself, proceed by consulting the Vehicle's Service Repair Manual for testing instructions, testing procedures, and flow charts related to retrieved code(s).
- To prolong battery life, the Code Reader automatically shuts "Off" approximately three minutes after it is disconnected from the vehicle. The DTCs retrieved, Monitor Status and Freeze Frame data (if any) will remain in the Code Reader's memory, and may be viewed at any time by turning the unit "On". If the Code Reader's batteries are removed, or if the Code Reader is re-linked to a vehicle to retrieve codes/data, any prior codes/data in its memory are automatically cleared.

THE SYSTEM MENU

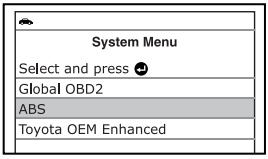
The System Menu provides the ability to retrieve "enhanced" DTCs and Anti-Lock Brake System (ABS) DTCs for most BMW, Chrysler/Jeep, Ford/Mazda, GM/Isuzu, Honda/Acura, Hyundai, Mercedes Benz, Nissan, Toyota/Lexus, Volkswagen and Volvo vehicles. The types of enhanced data available depends on the vehicle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

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

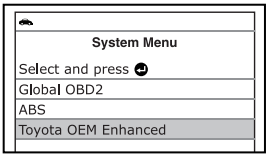
- To access the System Menu, press the **SYSTEM MENU** button. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired option, then press the **ENTER** button to view the selected information.



To view ABS DTCs: Select **ABS** from the System Menu. Refer to VIEWING ABS DTCs on page 44 to view ABS DTCs for your vehicle.



To view OEM enhanced DTCs: Select **OEM Enhanced** from the System Menu. Refer to VIEWING OEM ENHANCED DTCs on page 23 to view OEM enhanced DTCs for your vehicle.



VIEWING OEM ENHANCED DTCs

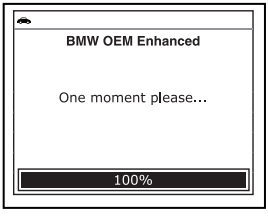
Refer to the appropriate paragraph to view enhanced data for your vehicle:

- BMW ..... page 23
- Chrysler/Jeep ..... page 25
- Ford/Mazda ..... page 27
- GM/Isuzu ..... page 29
- Honda/Acura ..... page 31
- Hyundai ..... page 33
- Mercedes Benz ..... page 35
- Nissan ..... page 37
- Toyota/Lexus ..... page 39
- Volkswagen ..... page 40
- Volvo ..... page 42

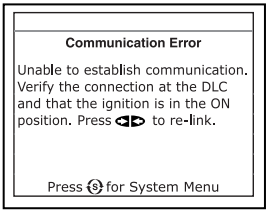
BMW Enhanced DTCs

When **BMW OEM Enhanced** is chosen from the System Menu, the Code Reader retrieves OEM enhanced DTCs from the vehicle's computer.

1. A "One moment please" message displays while the Code Reader retrieves the selected DTCs.

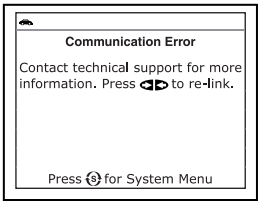


- If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.



  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.
  - 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 the **POWER/LINK** button to continue.

- If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.

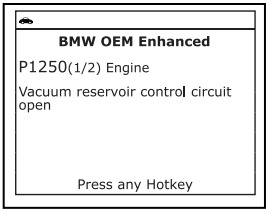


  - Press the **SYSTEM MENU** button to return to the System Menu.
  - Turn the ignition off, and disconnect the Code Reader.
  - Contact Technical Support for assistance.

2. To read the display:

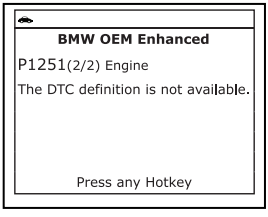
Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Code Reader is linked to (communicating with) the vehicle's computer.
- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.
- The related code definition is shown in the lower section of the LCD display.



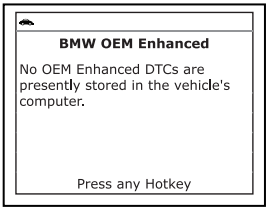
If the definition for the currently displayed code is not available, an advisory message shows on the Code Reader's LCD display.

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. Use the **UP** and **DOWN** buttons, as necessary, to view the additional information.*

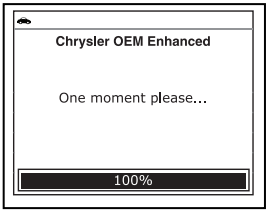
- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No OEM Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **SYSTEM MENU** button to return to the System Menu.



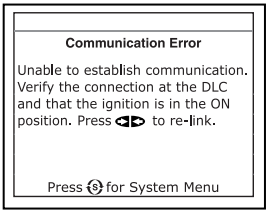
3. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/LINK** button again.
4. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.
   - To view *additional* enhanced DTCs, repeat steps **1** through **4**, above.
   - To exit the enhanced mode, press the **SYSTEM MENU** button to return to the System Menu. Use the **UP** and **DOWN** buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** button to return to the Global OBD2 mode.

Chrysler/Jeep Enhanced DTCs

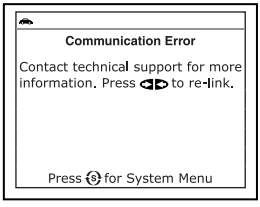
When **Chrysler OEM Enhanced** is chosen from the System Menu, the Code Reader retrieves OEM enhanced DTCs from the vehicle's computer.



1. A "One moment please" message displays while the Code Reader retrieves the selected DTCs.
   - If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.



     - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.
     - 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 the **POWER/LINK** button to continue.
   - If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.

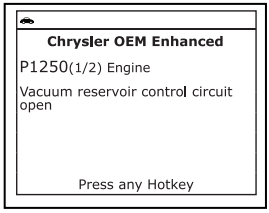


     - Press the **SYSTEM MENU** button to return to the System Menu.
     - Turn the ignition off, and disconnect the Code Reader.
     - Contact Technical Support for assistance.

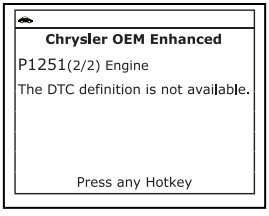
2. To read the display:

Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.
- The related code definition is shown in the lower section of the LCD display.



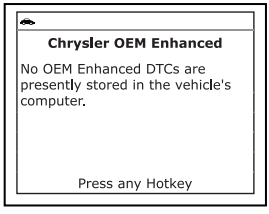
If the definition for the currently displayed code is not available, an advisory message shows on the Code Readers LCD display.



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. Use the **UP** and **DOWN** buttons, as necessary, to view the additional information.*

- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No OEM Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **SYSTEM MENU** button to return to the System Menu.



3. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.

- Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/LINK** button again.

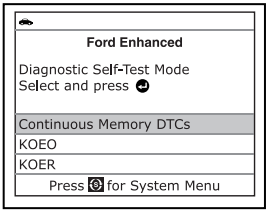
4. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.

- To exit the enhanced mode, press the **SYSTEM MENU** button to return to the System Menu. Use the **UP** and **DOWN** buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** button to return to the Global OBD2 mode.

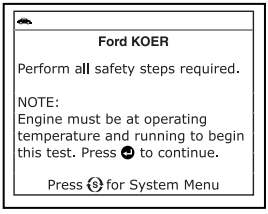
Ford/Mazda Enhanced DTCs

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

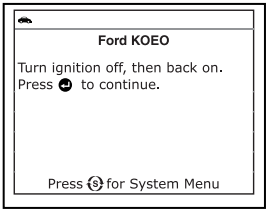
When **Ford OEM Enhanced** is chosen from the System Menu, the Ford Enhanced menu displays. You may view DTCs for either the "Continuous Memory Test", "KOEO (Key On Engine Off) Test" or "KOER (Key On Engine Running) Test."



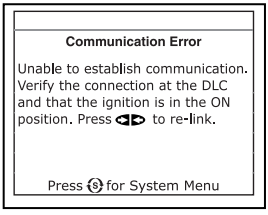
1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button.
   - If **KOER** is selected, an advisory message shows on the Code Reader's display.
     - Start and warm the engine to normal operating temperature, then press the **ENTER** ↵ button. Proceed to step **3**.



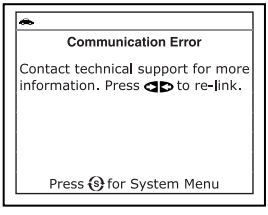
2. If **KOEO** or **Continuous Memory** is selected, an "instructional" message shows on the Code Reader's display.
   - Turn the ignition OFF, then back ON. Press the **ENTER** ↵ button. Proceed to step **3**.



3. A "One moment please" message displays while the test is in progress.
   - If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.
     - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.

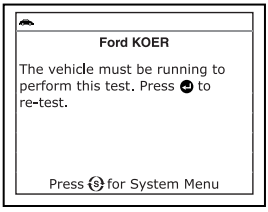


     - Verify the connection at the DLC, and verify the ignition is ON.
     - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
     - Press the **POWER/LINK** button to continue.
   - If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.

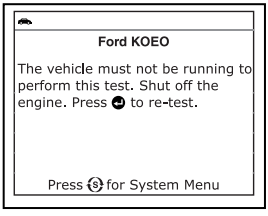


- Press the **SYSTEM MENU** button to return to the System Menu.
- Turn the ignition off, and disconnect the Code Reader.
- Contact Technical Support for assistance.

- If the **KOER** Test was selected, and the vehicle's engine *is not* running, an advisory message shows on the Code Reader's display.
  - Press the **SYSTEM MENU** button to return to the System Menu.

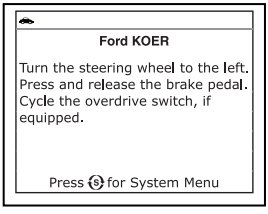


- If the **KOEO** Test was selected, and the vehicle's engine *is running*, an advisory message shows on the Code Reader's display.
  - Press the **SYSTEM MENU** button to return to the System Menu.



4. If the **KOER** test was selected, an "instructional" message shows on the Code Reader's display.

- Turn the steering wheel to the right, then release.
- Press and release the brake pedal.
- Cycle the overdrive switch (if equipped).

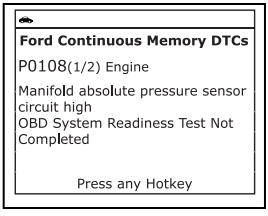


- A "One moment please" message displays while the test is in progress.

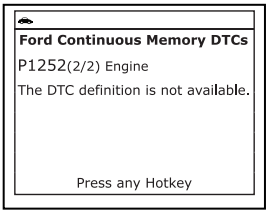
5. To read the display:

Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.
- The related code definition is shown in the lower section of the LCD display.



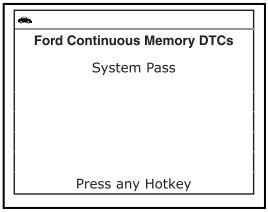
If the definition for the currently displayed code is not available, an advisory message shows on the Code Reader's LCD display.



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. Use the ▲ and ▼ buttons, as necessary, to view the additional information.

- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "System Pass" message is displayed. Press the **SYSTEM MENU** Ⓢ button to return to the System Menu.

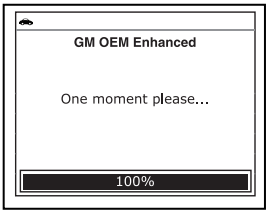


6. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/LINK** ⏻ button again.
7. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.
   - To view *additional* enhanced DTCs, repeat steps **1** through **5**, above.
   - To exit the enhanced mode, press the **SYSTEM MENU** Ⓢ button to return to the System Menu. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** ↵ button to return to the Global OBD2 mode.

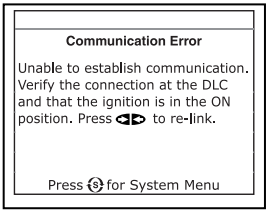
General Motors/Isuzu Enhanced DTCs

When **GM OEM Enhanced** is chosen from the System Menu, the Code Reader retrieves OEM enhanced DTCs from the vehicle's computer.

1. A "One moment please" message displays while the Code Reader retrieves the selected DTCs.

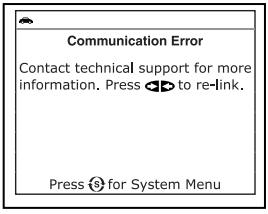


- If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.



  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.
  - 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 the **POWER/LINK** button to continue.

- If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.

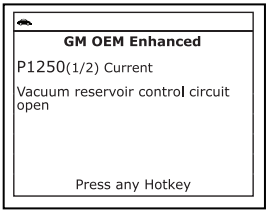


  - Press the **SYSTEM MENU** button to return to the System Menu.
  - Turn the ignition off, and disconnect the Code Reader.
  - Contact Technical Support for assistance.

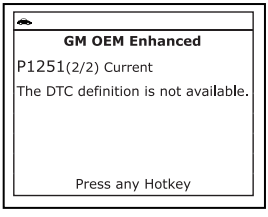
2. To read the display:

Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.
- The related code definition is shown in the lower section of the LCD display.



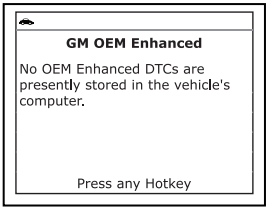
If the definition for the currently displayed code is not available, an advisory message shows on the Code Reader's LCD display.



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. Use the ▲ and ▼ buttons, as necessary, to view the additional information.

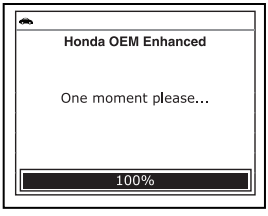
- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No OEM Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **SYSTEM MENU** Ⓢ button to return to the System Menu.



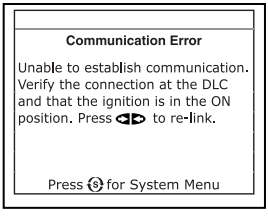
3. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/LINK** ⏻ button again.
4. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.
   - To exit the enhanced mode, press the **SYSTEM MENU** Ⓢ button to return to the System Menu. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** ↵ button to return to the Global OBD2 mode.

Honda/Acura Enhanced DTCs

When **Honda OEM Enhanced** is chosen from the System Menu, the Code Reader retrieves OEM enhanced DTCs from the vehicle's computer.

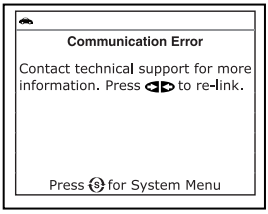


1. A "One moment please" message displays while the Code Reader retrieves the selected DTCs.
   - If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.
     - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.
     - 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 the **POWER/LINK** button to continue.

- If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.

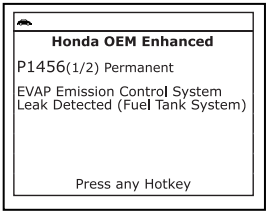


  - Press the **SYSTEM MENU** button to return to the System Menu.
  - Turn the ignition off, and disconnect the Code Reader.
  - Contact Technical Support for assistance.

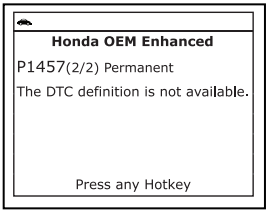
2. To read the display:

Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.
- The related code definition is shown in the lower section of the LCD display.



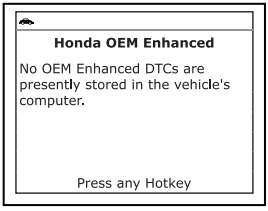
If the definition for the currently displayed code is not available, an advisory message shows on the Code Reader's LCD display.



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. Use the ▲ and ▼ buttons, as necessary, to view the additional information.

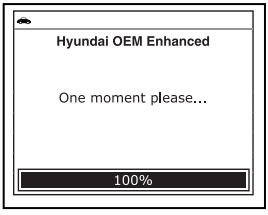
- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No OEM Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **SYSTEM MENU** button to return to the System Menu.



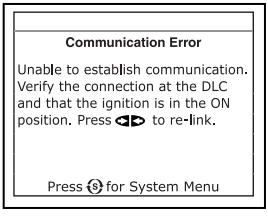
3. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/LINK** button again.
4. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.
   - To exit the enhanced mode, press the **SYSTEM MENU** button to return to the System Menu. Use the **UP** and **DOWN** buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** button to return to the Global OBD2 mode.

Hyundai Enhanced DTCs

When **Hyundai OEM Enhanced** is chosen from the System Menu, the Code Reader retrieves OEM enhanced DTCs from the vehicle's computer.

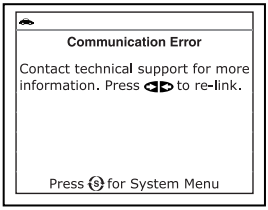


1. A "One moment please" message displays while the Code Reader retrieves the selected DTCs.
   - If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.
     - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.



   - 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 the **POWER/LINK** button to continue.

- If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.

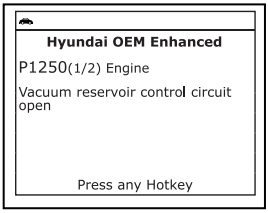


  - Press the **SYSTEM MENU** button to return to the System Menu.
  - Turn the ignition off, and disconnect the Code Reader.
  - Contact Technical Support for assistance.

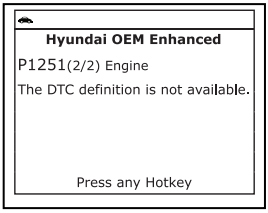
2. To read the display:

Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Code Reader is linked to (communicating with) the vehicle's computer.
- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.
- The related code definition is shown in the lower section of the LCD display.



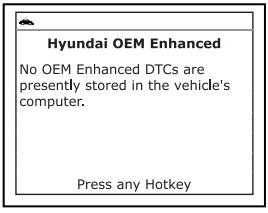
If the definition for the currently displayed code is not available, an advisory message shows on the Code Reader's LCD display.



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. Use the **UP** and **DOWN** buttons, as necessary, to view the additional information.*

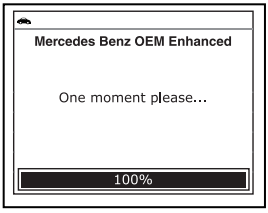
- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No OEM Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **SYSTEM MENU** button to return to the System Menu.



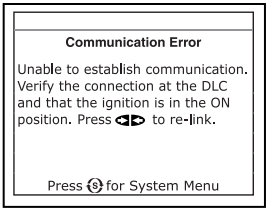
3. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/ LINK** button again.
4. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.
   - To view *additional* enhanced DTCs, repeat steps **1** through **4**, above.
   - To exit the enhanced mode, press the **SYSTEM MENU** button to return to the System Menu. Use the **UP** and **DOWN** buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** button to return to the Global OBD2 mode.

Mercedes Benz Enhanced DTCs

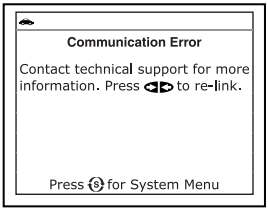
When **Mercedes Benz OEM Enhanced** is chosen from the System Menu, the Code Reader retrieves OEM enhanced DTCs from the vehicle's computer.



1. A "One moment please" message displays while the Code Reader retrieves the selected DTCs.
   - If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.



     - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.
     - 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 the **POWER/LINK** button to continue.
   - If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.

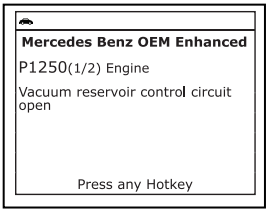


     - Press the **SYSTEM MENU** button to return to the System Menu.
     - Turn the ignition off, and disconnect the Code Reader.
     - Contact Technical Support for assistance.

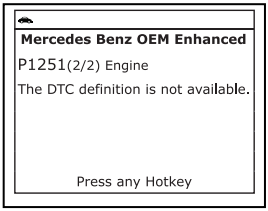
2. To read the display:

Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Code Reader is linked to (communicating with) the vehicle's computer.
- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.
- The related code definition is shown in the lower section of the LCD display.



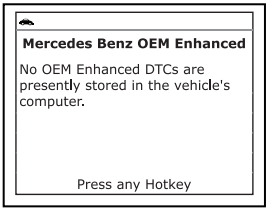
If the definition for the currently displayed code is not available, an advisory message shows on the Code Reader's LCD display.



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. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the additional information.*

- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No OEM Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **SYSTEM MENU** Ⓢ button to return to the System Menu.



3. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.

- Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/ LINK** button again.

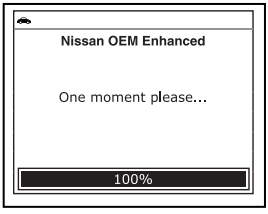
4. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.

- To view *additional* enhanced DTCs, repeat steps **1** through **4**, above.

- To exit the enhanced mode, press the **SYSTEM MENU** button to return to the System Menu. Use the **UP** and **DOWN** buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** button to return to the Global OBD2 mode.

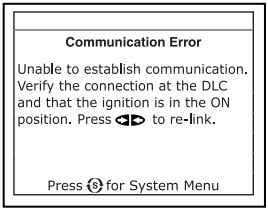
Nissan Enhanced DTCs

When **Nissan OEM Enhanced** is chosen from the System Menu, the Code Reader retrieves OEM enhanced DTCs from the vehicle's computer.



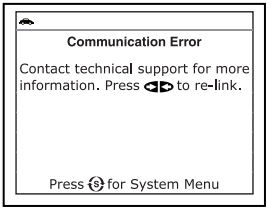
1. A "One moment please" message displays while the Code Reader retrieves the selected DTCs.

- If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.



  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.
  - 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 the **POWER/LINK** button to continue.

- If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.



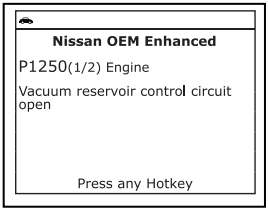
  - Press the **SYSTEM MENU** button to return to the System Menu.
  - Turn the ignition off, and disconnect the Code Reader.
  - Contact Technical Support for assistance.

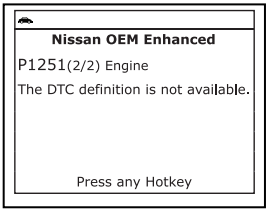
2. To read the display:

Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Code Reader is linked to (communicating with) the vehicle's computer.

- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.
- The related code definition is shown in the lower section of the LCD display.



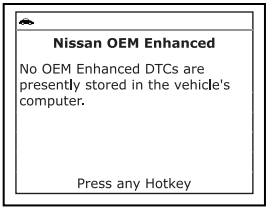


If the definition for the currently displayed code is not available, an advisory message shows on the Code Reader's LCD display.

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. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the additional information.*

- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No OEM Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **SYSTEM MENU** Ⓢ button to return to the System Menu.



3. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.

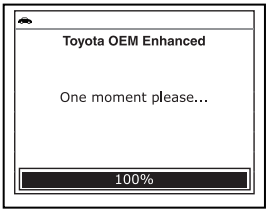
- Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/LINK** ⏻ button again.

4. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.

- To view *additional* enhanced DTCs, repeat steps **1** through **4**, above.
- To exit the enhanced mode, press the **SYSTEM MENU** Ⓢ button to return to the System Menu. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** ↵ button to return to the Global OBD2 mode.

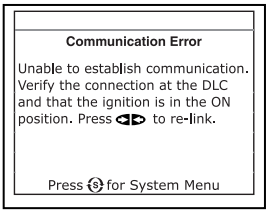
Toyota/Lexus Enhanced DTCs

When **Toyota OEM Enhanced** is chosen from the System Menu, the Code Reader retrieves OEM enhanced DTCs from the vehicle's computer.

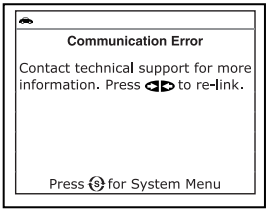


1. A "One moment please" message displays while the Code Reader retrieves the selected DTCs.

- If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.
  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.
  - 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 the **POWER/LINK** button to continue.



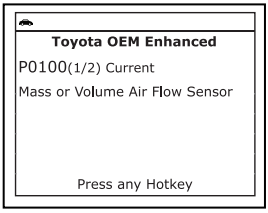
- If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.
  - Press the **SYSTEM MENU** button to return to the System Menu.
  - Turn the ignition off, and disconnect the Code Reader.
  - Contact Technical Support for assistance.



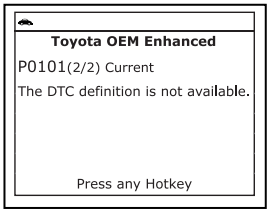
2. To read the display:

Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.
- The related code definition is shown in the lower section of the LCD display.



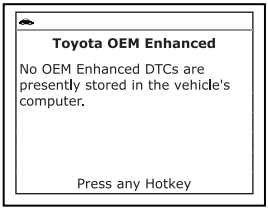
If the definition for the currently displayed code is not available, an advisory message shows on the Code Reader's LCD display.



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. Use the ▲ and ▼ buttons, as necessary, to view the additional information.

- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No OEM Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **SYSTEM MENU** Ⓢ button to return to the System Menu.



3. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.

   - Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/LINK** ⏻ button again.

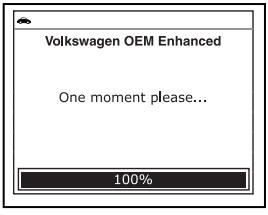
4. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.

   - To exit the enhanced mode, press the **SYSTEM MENU** Ⓢ button to return to the System Menu. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** ↵ button to return to the Global OBD2 mode.

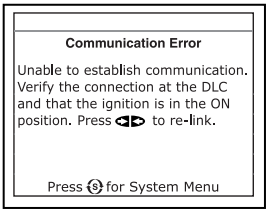
Volkswagen Enhanced DTCs

When **Volkswagen OEM Enhanced** is chosen from the System Menu, the Code Reader retrieves OEM enhanced DTCs from the vehicle's computer.

1. A "One moment please" message displays while the Code Reader retrieves the selected DTCs.

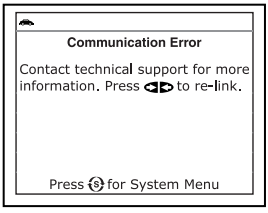


- If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.



  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.
  - 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 the **POWER/LINK** button to continue.

- If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.

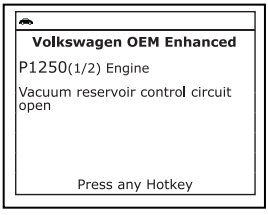


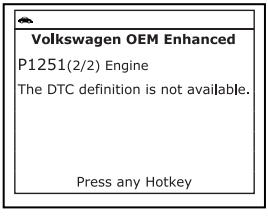
  - Press the **SYSTEM MENU** button to return to the System Menu.
  - Turn the ignition off, and disconnect the Code Reader.
  - Contact Technical Support for assistance.

2. To read the display:

Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Code Reader is linked to (communicating with) the vehicle's computer.
- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.
- The related code definition is shown in the lower section of the LCD display.



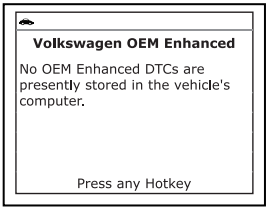


If the definition for the currently displayed code is not available, an advisory message shows on the Code Reader's LCD display.

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. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the additional information.*

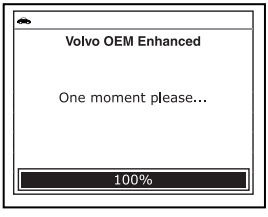
- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No OEM Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **SYSTEM MENU** Ⓢ button to return to the System Menu.



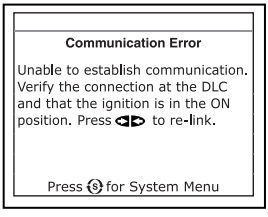
3. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/LINK** ⏻ button again.
4. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.
   - To view *additional* enhanced DTCs, repeat steps **1** through **4**, above.
   - To exit the enhanced mode, press the **SYSTEM MENU** Ⓢ button to return to the System Menu. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** ↵ button to return to the Global OBD2 mode.

Volvo Enhanced DTCs

When **Volvo OEM Enhanced** is chosen from the System Menu, the Code Reader retrieves OEM enhanced DTCs from the vehicle's computer.

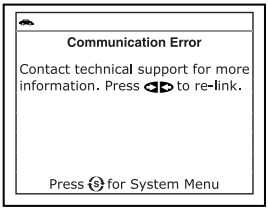


1. A "One moment please" message displays while the Code Reader retrieves the selected DTCs.
   - If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.
     - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.



- 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 the **POWER/LINK** button to continue.

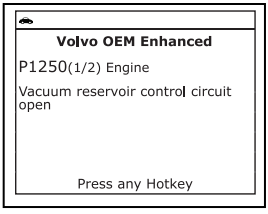
- If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.
  - Press the **SYSTEM MENU** button to return to the System Menu.
  - Turn the ignition off, and disconnect the Code Reader.
  - Contact Technical Support for assistance.

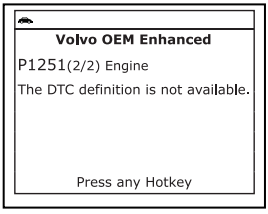


2. To read the display:

Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Code Reader is linked to (communicating with) the vehicle's computer.
- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.
- The related code definition is shown in the lower section of the LCD display.



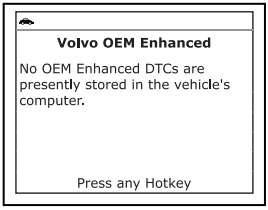


If the definition for the currently displayed code is not available, an advisory message shows on the Code Reader's LCD display.

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. Use the **UP** and **DOWN** buttons, as necessary, to view the additional information.*

- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No OEM Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **SYSTEM MENU** button to return to the System Menu.



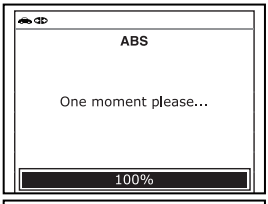
3. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/LINK** button again.
4. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.
   - To view *additional* enhanced DTCs, repeat steps **1** through **4**, above.
   - To exit the enhanced mode, press the **SYSTEM MENU** button to return to the System Menu. Use the **UP** and **DOWN** buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** button to return to the Global OBD2 mode.

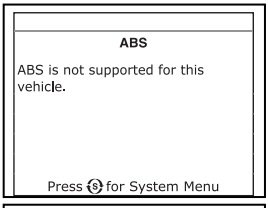
VIEWING ABS DTCs

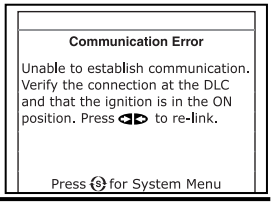
Refer to Vehicle Applications - ABS on page 88 for vehicle makes covered.

Reading ABS DTCs

1. When **ABS** is chosen from the System Menu, a "One moment please" message displays while the Code Reader retrieves the selected DTCs.
   - If ABS functionality is not supported by the vehicle under test, an advisory message shows on the Code Reader's display. Press the **SYSTEM MENU** button to return to the System Menu.
   - If the Code Reader fails to link to the vehicle's computer, a "Communication Error" message shows on the Code Reader's display.
     - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.

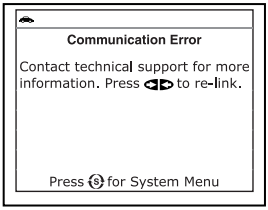






- Verify the connection at the DLC, and verify the ignition is ON.
- Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.
- Press the **POWER/LINK** button to continue.

- If the Code Reader **cannot** link to the vehicle's computer after three attempts, the message "Contact Technical Support" displays.

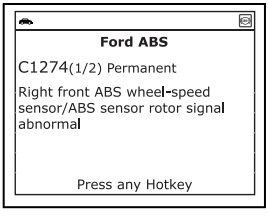


  - Press the **SYSTEM MENU** button to return to the System Menu.
  - Turn the ignition off, and disconnect the Code Reader.
  - Contact Technical Support for assistance.

2. To read the display:

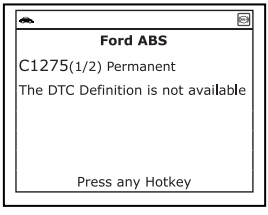
Refer to DISPLAY FUNCTIONS on page 6 for a description of LCD display elements.

- A visible icon indicates that the Code Reader is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Code Reader is linked to (communicating with) the vehicle's computer.
- The upper left corner of the display shows the Diagnostic Trouble Code (DTC), the number of the code currently being displayed and the total number of codes retrieved, and the type of code.



- The related code definition is shown in the lower section of the LCD display.

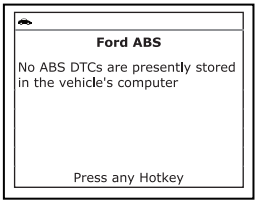
If the definition for the currently displayed code is not available, an advisory message shows on the Code Reader's LCD display.



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. Use the **UP** and **DOWN** buttons, as necessary, to view the additional information.*

- The Code Reader will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No ABS DTC's are presently stored in the vehicle's computer" is displayed. Press the **SYSTEM MENU** button to return to the System Menu.



3. If more than one code was retrieved press the **DTC/FF** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Code Reader's communication link with the vehicle's computer disconnects. To re-establish communication, press the **POWER/LINK** button again.
4. When the last retrieved DTC has been displayed and the **DTC/FF** button is pressed, the Code Reader returns to the "Priority" Code.
   - To exit the enhanced mode, press the **SYSTEM MENU** button to return to the System Menu. Use the **UP** and **DOWN** buttons, as necessary, to highlight **Global OBD**, then press the **ENTER** button to return to the Global OBD2 mode.

ERASING DIAGNOSTIC TROUBLE CODES (DTCs)

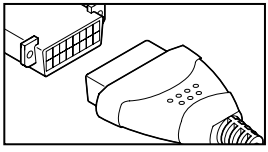
When the Code Reader's ERASE function is used to erase DTCs from the vehicle's on-board computer, "Freeze Frame" data and manufacturer-specific-enhanced data are also erased. Unlike other codes which can be removed from the vehicle's control module, PERMANENT codes cannot. This holds true regardless of the tool being used or color of the status LED display. PERMANENT codes will automatically erase when the control module no longer detects the fault that originally caused the code.

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.

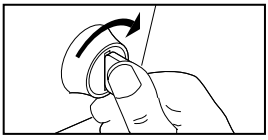
Erase DTCs from the computer's memory as follows:

When DTCs are erased from the vehicle's computer memory, the I/M Readiness Monitor Status program resets the status of all Monitors to a not run "flashing" condition. To set all of the Monitors to a DONE status, an OBD2 Drive Cycle must be performed. Refer to your vehicle's service manual for information on how to perform an OBD2 Drive Cycle for the vehicle under test.

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

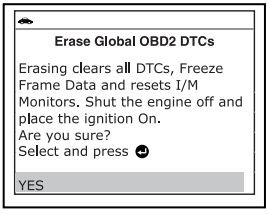


2. Perform the Code Retrieval procedure as described on page 16.



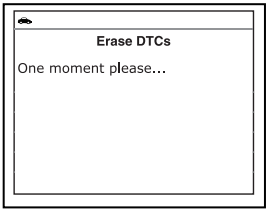
- **To erase OBD2 DTCs:** Wait until the codes are displayed on the Code Reader's LCD and then proceed to step 3.
- **To erase enhanced or ABS DTCs:** Press the **SYSTEM MENU** Ⓢ button to display the System Menu. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button. Perform the appropriate Code Retrieval procedure (see page 16 for more information) and then proceed to step 3.

3. Press and release the **ERASE** button. A confirmation message shows on the LCD display.

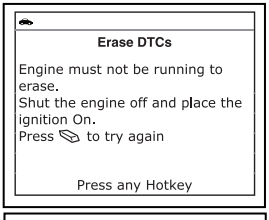


- If you are sure you want to proceed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to continue.
- If you do not want to proceed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to cancel the erase procedure.

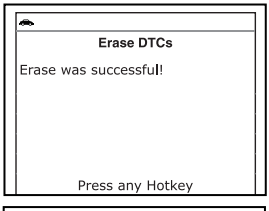
4. If you chose to erase DTCs, a "One moment please…" message displays while the erase function is in progress.



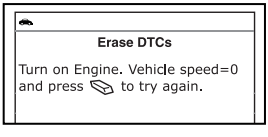
*If the vehicle's engine is running, an advisory message shows on the Code Reader's display. Turn the engine OFF, then turn the ignition back to ON. DO NOT start the engine. Press the **ENTER** ↵ button to continue.*



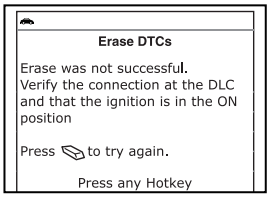
- If the erase was successful, a confirmation message shows on the display. Press the **SYSTEM MENU** Ⓢ button to return to the System Menu.



*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 the **ERASE** button to try again.*



- If the erase was not successful, an advisory message shows on the display indicating the erase request was sent to the vehicle's computer. Press the **SYSTEM MENU** button to return to the System Menu.



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.

I/M READINESS TESTING

I/M is an Inspection and Maintenance program legislated by the Government to meet federal clean-air standards.

The program requires that a vehicle be taken periodically to an Emissions Station for an "Emissions Test" or "Smog Check," where the emissions-related components and systems are inspected and tested for proper operation. Emissions Tests are generally performed once a year, or once every two years.

On OBD2 systems, the I/M program is enhanced by requiring vehicles to meet stricter test standards. One of the tests instituted by the Federal Government is called I/M 240. On I/M 240, the vehicle under test is driven under different speeds and load conditions on a dynamometer for 240 seconds, while the vehicle's emissions are measured.

Emissions tests vary depending on the geographic or regional area in which the vehicle is registered. If the vehicle is registered in a highly urbanized area, the I/M 240 is probably the type of test required. If the vehicle is registered in a rural area, the stricter "dynamometer type" test may not be required.

I/M Readiness Monitors

I/M Readiness shows whether the various emissions-related systems on the vehicle are operating properly and are ready for Inspection and Maintenance testing.

Emissions Inspection and Maintenance (I/M) Readiness

Monitor Status Information

I/M Readiness Monitor Status shows which of the vehicle's Monitors have run and completed their diagnosis and testing, and which ones have not yet run and completed testing and diagnosis of their designated sections of the vehicle's emissions system.

- If a Monitor was able to meet all the conditions required to enable it to perform the self-diagnosis and testing of its assigned engine system, it means the monitor "HAS RUN."

- If a Monitor has not yet met all the conditions required for it to perform the self-diagnosis and testing of its assigned engine system; it means the Monitor "HAS NOT RUN."

The Monitor Run/Not Run status does not show whether or not a problem exists in a system. Monitor status only indicates whether a particular Monitor has or has not run and performed the self-diagnosis and testing of its associated system.

Performing I/M Readiness Quick Check

When a vehicle first comes from the factory, all Monitors indicate a "HAVE RUN" status. This indicates that all Monitors have run and completed their diagnostic testing. The "HAVE RUN" status remains in the computer's memory, unless the Diagnostic Trouble Codes are erased or the vehicle's computer memory is cleared.

The Code Reader allows you to retrieve Monitor/System Status Information to help you determine if the vehicle is ready for an Emissions Test (Smog Check). In addition to retrieving Diagnostic Trouble Codes, the Code Reader also retrieves Monitor Run/Not Run status. This information is very important since different areas of the state/country have different emissions laws and regulations concerning Monitor Run/Not Run status.

Before an Emissions Test (Smog Check) can be performed, your vehicle must meet certain rules, requirements and procedures legislated by the Federal and state (country) governments where you live.

1. In most areas, one of the requirements that must be met before a vehicle is allowed to be Emissions Tested (Smog Checked) is that the vehicle does not have any Diagnostic Trouble Codes present (with the exception of PENDING Diagnostic Trouble Codes).
2. In addition to the requirement that no Diagnostic Trouble Codes be present, some areas also require that all the Monitors that a particular vehicle supports indicate a "Has Run" status condition before an Emissions Check may be performed.
3. Other areas may only require that some (but not all) Monitors indicate a "Has Run" status before an Emissions Test (Smog Check) may be performed.

Monitors with a "Has Run" status indicate that all the required conditions they needed to perform diagnosis and testing of their assigned engine area (system) have been met, and all diagnostic testing has completed successfully.

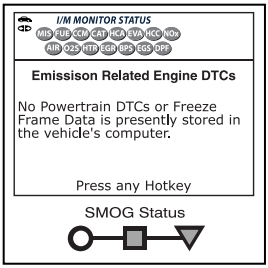
Monitors with a "Has Not Run" status have not yet met the conditions they need to perform diagnosis and testing of their assigned engine area (system), and have not been able to perform diagnostic testing on that system.

The green, yellow and red LEDs provide a quick way to help you determine if a vehicle is ready for an Emissions Test (Smog Check). Follow the instructions below to perform the Quick Check.

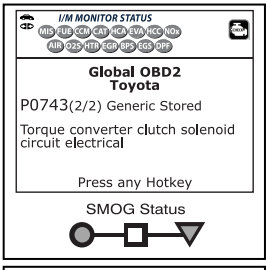
Perform the CODE RETRIEVAL PROCEDURE as described on page 16, then interpret the LED indications as follows:

Interpreting I/M Readiness Test Results

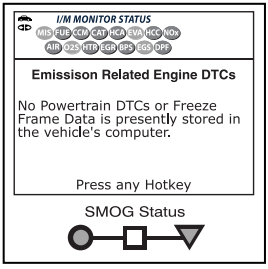
1. **GREEN LED** - Indicates that all engine systems are "OK" and operating normally (all Monitors supported by the vehicle have run and performed their self-diagnostic testing). The vehicle is ready for an Emissions Test (Smog Check), and there is a good possibility that it can be certified.



2. **YELLOW LED** - Determine from the CODE RETRIEVAL PROCEDURE (page 16) which of the two possible conditions is causing the yellow LED to light.



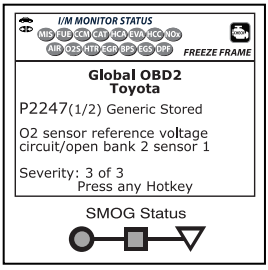
   - If a "PENDING" Diagnostic Trouble Code is causing the yellow LED to light, it is possible that the vehicle will be allowed to be tested for emissions and certified. Currently, most areas (states / countries) will allow an Emissions Test (Smog Check) to be performed if the only code in the vehicle's computer is a "PENDING" Diagnostic Trouble Code.



   - If the illumination of the Yellow LED is being caused by monitors that “have not run” their diagnostic testing, then the issue of the vehicle being ready for an Emissions Test (Smog Check) depends on the emissions regulations and laws of your local area.

   - From the code retrieval procedure, determine the status of each Monitor (a solid Monitor icon shows Monitor "Has Run" status, a flashing Monitor icon indicates "Has Not Run" status). Take this information to an emissions professional to determine (based on your test results) if your vehicle is ready for an Emissions Test (Smog Check).

3. **RED LED** - Indicates there is a problem with one or more of the vehicle's systems. A vehicle displaying a red LED is definitely not ready for an Emissions Test (Smog Check). The red LED is also an indication that there are Diagnostic Trouble Code(s) present (displayed on the Code Reader's screen). The Malfunction Indicator (Check Engine) Lamp on the vehicle's



instrument panel will light steady. The problem that is causing the red LED to light must be repaired before an Emissions Test (Smog Check) can be performed. It is also suggested that the vehicle be inspected/repaired before driving the vehicle further.

If the Red LED was obtained, there is a definite problem present in the system(s). In these cases, you have the following options.

- Repair the vehicle yourself. If you are going to perform the repairs yourself, proceed by reading the vehicle service manual and following all its procedures and recommendations.
- Take the vehicle to a professional to have it serviced. The problem(s) causing the red LED to light must be repaired before the vehicle is ready for an Emissions Test (Smog Check).

Using the I/M Readiness Monitor Status to Confirm a Repair

The I/M Readiness Monitor Status function can be used (after repair of a fault has been performed) to confirm that the repair has been performed correctly, and/or to check for Monitor Run Status. Use the following procedure to determine I/M Readiness Monitor Status:

1. Using retrieved Diagnostic Trouble Codes (DTCs) and code definitions as a guide, and following manufacturer's repair procedures, repair the fault or faults as instructed.
2. After the fault or faults have been repaired, connect the Code Reader to the vehicle's DLC and erase the code or codes from the vehicle's computer memory.
   - See page 46 for procedures for ERASING DIAGNOSTIC TROUBLE CODES (DTCs) from the vehicle's on-board computer.
   - Write the codes down on a piece of paper for reference before erasing.
3. After the erase procedure is performed, most of the Monitor icons on the Code Reader's display will be flashing. Leave the Code Reader connected to the vehicle, and perform a Trip Drive Cycle for each "flashing" Monitor:

Misfire, Fuel and Comprehensive Component Monitors run continuously and their icons will always be on solid, even after the erase function is performed.

   - Each DTC is associated with a specific Monitor. Consult the vehicle's service manual to identify the Monitor (or Monitors) associated with the faults that were repaired. Follow the manufacturer's procedures to perform a Trip Drive Cycle for the appropriate Monitors.
   - While observing the Monitor icons on the Code Reader's display, perform a Trip Drive Cycle for the appropriate Monitor or Monitors.

4. When a Monitor's Trip Drive Cycle is performed properly, the Monitor icon on the Code Reader's display changes from "flashing" to "solid," indicating that the Monitor has run and finished its diagnostic testing.
   - If, after the Monitor has run, the MIL on the vehicle's dash is not lit, and no stored or pending codes associated with that particular Monitor are present in the vehicle's computer, the repair was successful.
   - If, after the Monitor has run, the MIL on the vehicle's dash lights and/or a DTC associated with that Monitor is present in the vehicle's computer, the repair was unsuccessful. Refer to the vehicle's service manual and recheck repair procedures.

The Code Reader is a special tool that communicates with the vehicle's computer. The Code Reader lets you view and/or "capture" (record) "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.

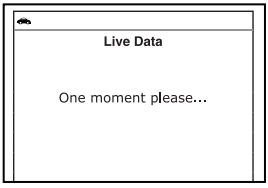
In effect the Code Reader lets you view, in "real time", the same signal values generated by the sensors, actuators, switches and/or vehicle system status information used by the vehicle's computer when calculating and conducting system adjustments and corrections.

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

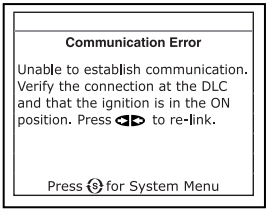
Each PID (sensor, actuator switch, status, etc.) has a set of operating characteristics and features (parameters) that serve to identify it. The Code Reader displays this information for each sensor, actuator, switch or status that is supported by the vehicle under test.

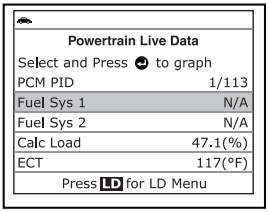
***WARNING**: If the vehicle must be driven in order to perform a troubleshooting procedure, **ALWAYS** have a second person help you. One person should drive the vehicle while the other person observes the Code Reader data. Trying to drive and operate the Code Reader at the same time is dangerous, and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

VIEWING LIVE DATA



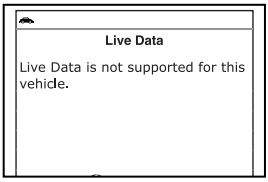
1. While linked to the vehicle, start the engine, then press and release the **LD** button.
2. A "One moment please . . ." message displays while the Code Reader establishes communication with the vehicle.
   - If the Code Reader fails to establish communication with the vehicle, a "Communication Error" message is shown on the Code Reader's display.
     - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.
     - 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 the **ENTER** ↵ button to continue.





3. Real-time Live Data (PID) information supported by the vehicle under test displays.

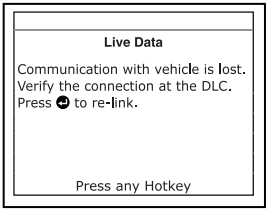
- If Live Data is not supported by the vehicle under test, an advisory message displays. Press the **SYSTEM MENU** button to return to the System Menu. Live Data is not available for your vehicle.



Remember, what you are viewing is "real-time" Live Data. The values (volts, rpm, temperature, vehicle speed, system status etc) for the various PIDS displayed may change as the vehicle's operating conditions change.

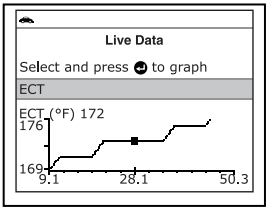
4. A vehicle usually supports several PIDs, however, only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow will be shown on the display. Use the **UP** and **DOWN** buttons, as necessary, to scroll up or down to view all available PID data.

- If communication with the vehicle is lost while viewing Live Data, a Communication Lost" message shows on the Code Reader's display.

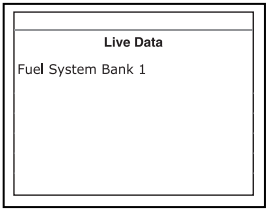


5. Press and release the **ENTER** button to view the currently selected PID in “graph” mode. Press and release the **ENTER** button again to return to the PID list.

- 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 the **LD** button to superimpose one graph on the other. Release the **LD** button to separate the graphs.



6. Press and hold the **ENTER** button to view the “expanded” definition for the currently selected PID. Release the **ENTER** button to return to the PID list.
7. If you experience vehicle problems, view and/or compare the Live Data (PID) information displayed on the Code Reader to specifications in the vehicle's repair manual.

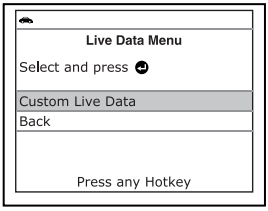


*If desired, you can "customize" the Live Data display to show only those PIDs you are interested in viewing. See **Customizing Live Data (PIDs)** below for details. You may also choose to "capture" (record) Live Data for later viewing. See CUSTOMIZING LIVE DATA (PIDs) on page 55 for details.*

CUSTOMIZING LIVE DATA (PIDs)

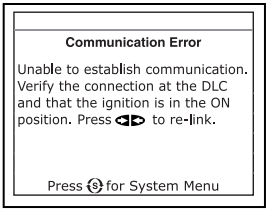
This feature lets you customize the Code Reader display to show only those PIDs that are of interest at the current time. You can customize the Live Data display by placing the Code Reader in "Custom Live Data" mode and selecting only the PIDs that you wish to display. To customize the Live Data display, proceed as follows:

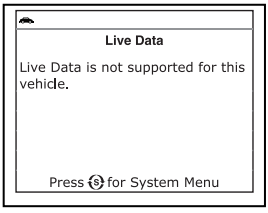
1. With the Code Reader in Live Data mode (see VIEWING LIVE DATA on page 53), press and hold the **LD** button until the Live Data Menu displays, then release the **LD** button.



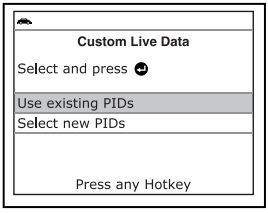
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Custom Live Data**, then press the **ENTER** ↵ button.

- If the Code Reader fails to establish communication with the vehicle, a "Communication Error" message is shown on the Code Reader's display.
  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.
  - 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 the **POWER/LINK** ⏻ button to continue.





- If Live Data is not supported by the vehicle under test, an advisory message displays. Press the **SYSTEM MENU** Ⓢ button to return to the System Menu. Live Data is not available for your vehicle.
- If custom Live Data was previously selected, the Select PIDs to Use screen displays.

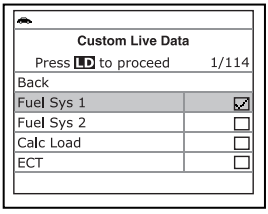


  - To use the *existing* custom Live data selections, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Use existing PIDs**, then press the **ENTER** ↵ button. Proceed to step **5**.

- To select *new* custom Live Data, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Select new PIDs**, then press the **ENTER** ↵ button. The Custom Live Data menu displays, with the first PID in the menu highlighted. Proceed to step **3**.

■ If custom Live Data was not previously selected, the Custom Live Data menu displays, with the first PID in the menu highlighted. Proceed to step **3**.

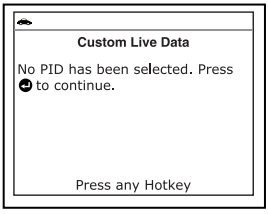
3. Use the **UP** ▲ and **DOWN** ▼ buttons to scroll through the available PIDs. When the PID you wish to display is highlighted, press the **ENTER** ↵ button to select it (a "checkmark" will show in the checkbox to the right of the PID to confirm your selection). Repeat the procedure until only the PIDs you want to display have all been selected.



■ To deselect a currently selected PID, highlight the PID, then press the **ENTER** ↵ button. The checkmark will be removed from the checkbox.

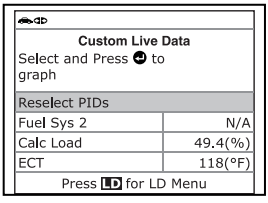
4. When you are finished making your selection(s), press the **LD** button to continue.

■ If *no PIDs* have been selected, an advisory message displays. Press the **ENTER** ↵ button to return to the Custom Live Data menu.



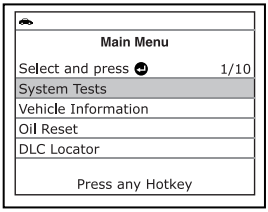
5. The Code Reader is now in "Custom Live Data" mode. Only the PIDs you selected are shown on the Code Readers display.

■ To change the current custom Live Data selections, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Reselect PIDs**, then press the **ENTER** ↵ button to return to the Custom Live Data menu. Repeat step **4**.



6. To exit the "Custom Live Data" mode, press the **M** button to return to the Live Data Menu.

In addition to retrieving Diagnostic Trouble Codes (DTCs), you can use the Code Reader to perform additional diagnostic tests, to view diagnostic and vehicle information stored in your vehicle's on-board computer, and to configure the Code Reader 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 your 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.
- **Vehicle Information** – Displays the Vehicle Info menu, which lets you retrieve and view reference information for the vehicle under test.
- **Oil Reset** – Lets you reset the Oil Maintenance Light.
- **DLC Locator** – Lets you find the location of the Data Link Connector (DLC) for a specified vehicle.
- **Battery Reset** – Lets you reset the battery monitor system after battery replacement.
- **Battery/Alternator Monitor** – Performs a check of the vehicle's battery and alternator system to ensure the system is operating within acceptable limits.
- **Trip Cycle Procedure** – Lets you view trip cycle procedures for a selected vehicle monitor.
- **Firmware Version** – Displays the Code Reader'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 Code Reader to your particular needs.

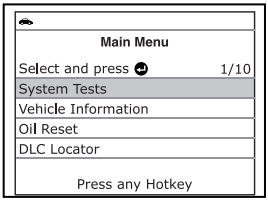
*The **System Tests** and **Vehicle Information** options are shown only when the Code Reader is in Global OBD2 mode.*

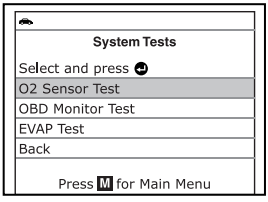
SYSTEM TEST MENU

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 the **M** button.
   - The Main Menu displays.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **System Tests**, then press the **ENTER** ↵ button.
   - The System Test menu displays.





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

O2 Sensor Test

The **O2 Sensor Test** function lets you retrieve and view O2 sensor monitor test results for the most recently completed tests from your vehicle's on-board computer.

Vehicles are equipped with multiple O2 sensors. O2 sensors are installed both upstream of (before) and downstream of (after) the exhaust system Catalytic Converters. The name of an O2 sensor identifies its location in the exhaust system. The name of each O2 sensor is made up of three parts:

O2S XX YY -or- **O2S X Y**

- **O2S** - this is the basic designation for all O2 sensors.
- **X** or **XX** - These characters identify the location of the O2 sensor in relation to a cylinder bank. An O2 sensor for cylinder bank 1 is identified by the designation “1” or "B1"; a sensor for cylinder bank 2 is identified as “2” or "B2."

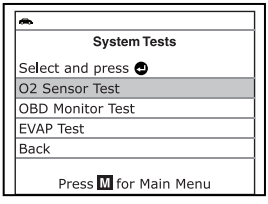
”Bank One” indicates the side of the engine where cylinder number one is located (V-type engines). Bank Two is opposite of Bank One.

- **Y** or **YY** - These characters identify the location of the O2 sensor in relation to the exhaust system catalyst. An O2 sensor located upstream of the catalyst is identified by the designation “1” or “S1”, a sensor located downstream of the Catalytic Converter is identified as “2” or "S2."

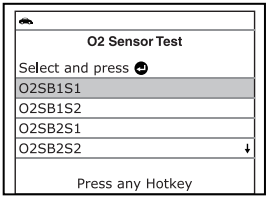
For example, **O2S12** or **O2SB1S2** is the designation for the downstream O2 sensor for cylinder bank 1.

The Code Reader does not perform O2 sensor tests, but retrieves results from the most recently performed O2 sensor tests from the on-board computer's memory. You may retrieve O2 sensor test results for only one test of one sensor at any given time.

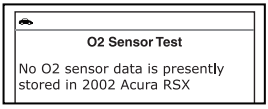
1. From the System Test menu, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **O2 Sensor Test,** then press the **ENTER** ↵ button.
2. A "One moment please..." message displays while the request is sent to the vehicle's on-board computer.



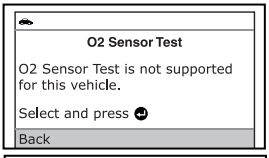
- The Select Sensor screen displays. The screen shows all O2 sensors applicable to the vehicle under test.



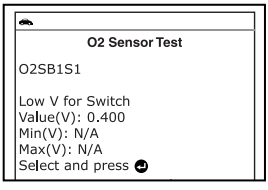
*If O2 sensor test data is not presently stored in the vehicle's computer, an advisory message shows on the Code Reader's display. Press the **M** button to return to the Main Menu.*



*If O2 sensor tests are not supported by the vehicle under test, an advisory message shows on the Code Reader's display. Press the **M** button to return to the Main Menu.*



3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the O2 sensor for which you wish to view test results, then press the **ENTER** ↵ button.



4. When test results have been retrieved, data for the selected sensor test will show on the Code Reader's display.
5. When you have finished viewing the retrieved test data, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Back**, then press the **ENTER** ↵ button to return to the Select Sensor screen.
6. Repeat steps **3** through **5** to view test results for additional sensors. When you have finished viewing the retrieved test data use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight Back on the Select Sensor screen, then press the **ENTER** ↵ button to return to the System Test menu; or, press the **M** button to return to the Main Menu.

OBD Monitor Test

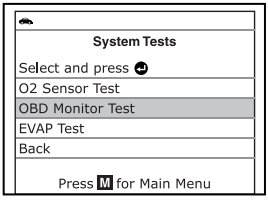
The **OBD Monitor Test** function retrieves and displays test results for emission-related powertrain components and systems that are not continuously monitored. The tests available are determined by the vehicle manufacturer.

The Code Reader 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.

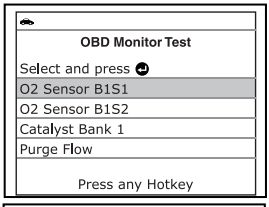
1. From the System Test menu, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **OBD Monitor Test**, then press the **ENTER** ↵ button.

2. A "One moment please. . ." message displays while the request is sent to the vehicle's on-board computer.

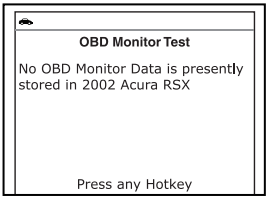
- The Select Test screen displays. The screen shows all tests applicable to the vehicle under test. Refer to the vehicle's service repair manual for information related to non-continuous tests.



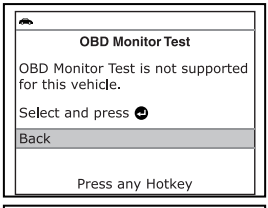
*If OBD monitor test data is not presently stored in the vehicle's computer, an advisory message shows on the Code Reader's display. Press the **M** button to return to the Main Menu.*



*If OBD monitor tests are not supported by the vehicle under test, an advisory message shows on the Code Reader's display. Press the **M** button to return to the Main Menu.*

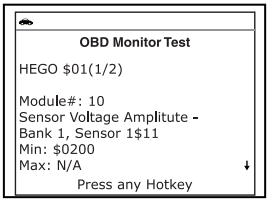


3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired test, then press the **ENTER** ↵ button.



4. When test results have been retrieved, data for the selected test will show on the Code Reader's display. 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 Code Reader by comparing the **Test Value** against the displayed test limit (either **Min** or **Max**). Status is shown as either **Low**, **High** or **OK**.*

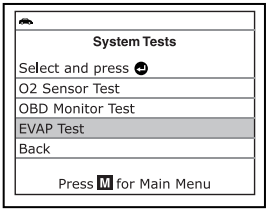
5. Repeat steps **3** and **4** to view test results for additional tests. When you have finished viewing the retrieved test data, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Back** on the Select Test screen, then press the **ENTER** ↵ button to return to the System Test menu; or, press the **M** button to return to the Main Menu.

EVAP Test

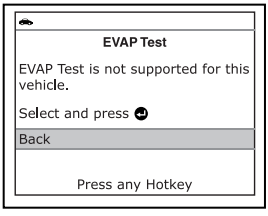
The **EVAP Test** function lets you initiate a leak test for the vehicle's EVAP system.

*The Code Reader 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. BEFORE using the **EVAP Test** function, refer to the vehicle's service repair manual to determine the procedures necessary to stop the test.*

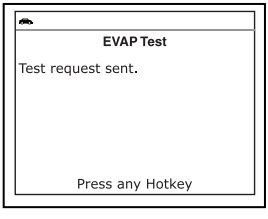
1. From the System Test menu, use the **UP** ▲ and **DOWN** ▼ buttons as necessary, to highlight **EVAP Test**, then press the **ENTER** ↵ button.
2. A "One moment please..." message displays while the request is sent to the vehicle's on-board computer.



*Some vehicle manufacturers do not allow Code Reader's or other external devices to control vehicle systems. If the **EVAP Test** is not supported by the vehicle under test, an advisory message shows on the Code Reader's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Back**, then press the **ENTER** ↵ button to return to the Select Sensor screen.*



3. When the EVAP leak test has been initiated by the vehicle's on-board computer, a confirmation message shows on the Code Reader's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Back**, then press the **ENTER** ↵ button to return to the System Test menu; or, press the **M** button to return to the Main Menu.



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

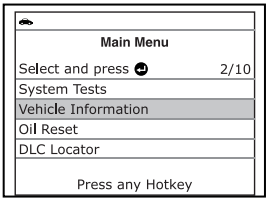
The Vehicle ID function is applicable to model year 2000 and newer OBD2-compliant vehicles.

The Code Reader 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 ODB2 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.

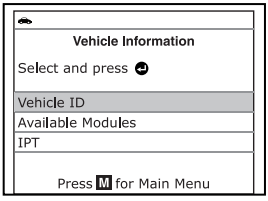
1. With the Code Reader in OBD2 mode, press and release the **M** button.

- The Main Menu displays.



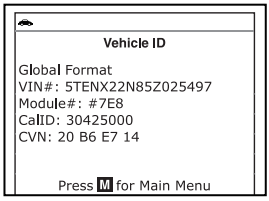
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Vehicle Information**, then press the **ENTER** ↵ button.

- The Vehicle Information menu displays.



3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Vehicle ID**, then press the **ENTER** ↵ button.

*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 is shown on the Code Reader's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.

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

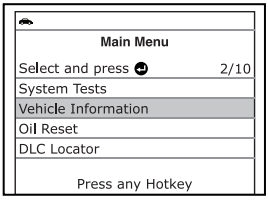
Viewing Available Modules

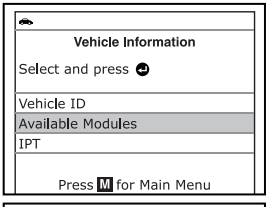
The Code Reader can retrieve a list of modules supported by the vehicle under test.

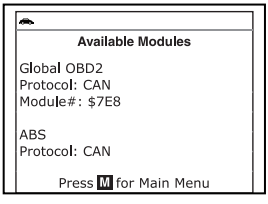
1. With the Code Reader in OBD2 mode, press and release the **M** button.

- The Main Menu displays.

2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Vehicle Information**, then press the **ENTER** ↵ button.
   - The Vehicle Information menu displays.
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Available Modules**, then press the **ENTER** ↵ button.
4. When the retrieval process is completed, a complete list of modules supported by the vehicle under test is shown on the Code Reader's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
5. When you have finished viewing the list of available modules, press the **M** button to return to the Main Menu.



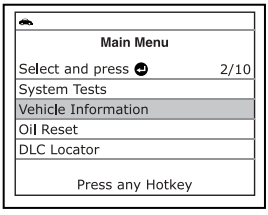


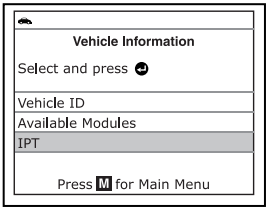


Viewing In-use Performance Tracking (IPT)

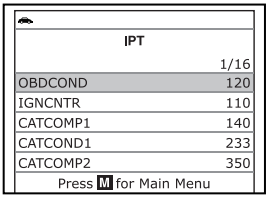
The Code Reader can retrieve In-use Performance Tracking (IPT) statistics for monitors supported by the vehicle under test. Two values are returned for each monitor; the number of times that all conditions necessary for a specific monitor to detect a malfunction have been encountered (XXXCOND), and the 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).

1. With the Code Reader in OBD2 mode, press and release the **M** button.
   - The Main Menu displays.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Vehicle Information**, then press the **ENTER** ↵ button.
   - The Vehicle Information menu displays.
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **IPT**, then press the **ENTER** ↵ button.

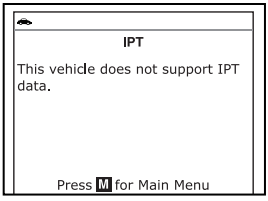




4. When the retrieved process is completed, In-use Performance Tracking statistics for monitors supported by the vehicle under test are shown on the Code Reader's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.



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

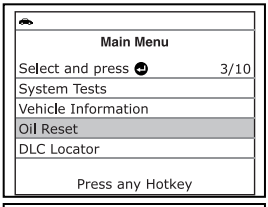


5. When you have finished viewing the statistics, press the **M** button to return to the Main Menu.

RESETTING THE OIL MAINTENANCE LIGHT

Refer to VEHICLE APPLICATIONS – MAKES COVERED on page 89 for vehicle makes covered.

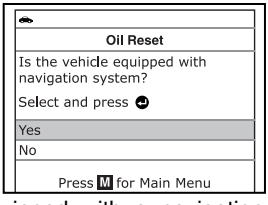
1. While linked to the vehicle, press the **M** button.



   - The Main Menu displays.

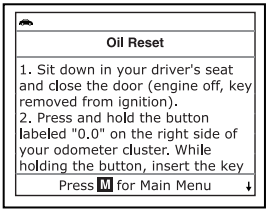
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Oil Reset**, then press the **ENTER** ↵ button.

   - The Oil Reset screen displays.

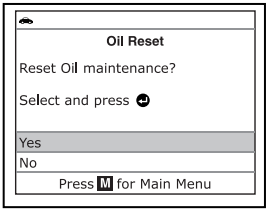


   - If the vehicle under test is equipped with a navigation system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to continue.
   - If the vehicle under test is now equipped with a navigation system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to continue.

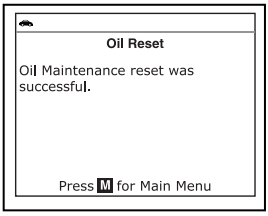
*If the Code Reader cannot reset the Oil Maintenance Light, an "instructional" dialog displays, showing the manual procedures for resetting the indicator light. Use the **UP** ▲ and **DOWN** ▼ buttons to view the entire procedure. When finished, press the **M** button to return to the Main Menu.*



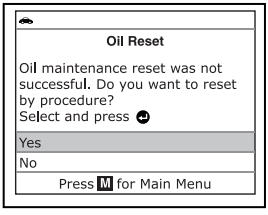
3. The Reset Oil Maintenance Indicator screen displays.



   - If you do not wish to proceed with the reset process, use the **UP** and **DOWN** buttons, as necessary, to highlight **No**, then press the **ENTER** button to return to the System Menu.
   - If you wish to proceed with the reset process, use the **UP** and **DOWN** buttons, as necessary, to highlight **Yes**, then press the **ENTER** button to continue.



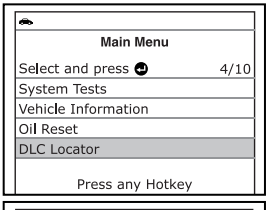
4. When the reset process has competed, a confirmation message shows on the Code Reader's display. Press the **M** button to return to the Main Menu.



   - If the oil reset was not successful, an advisory message displays.
   - To perform the oil reset by procedure, use the use the **UP** and **DOWN** buttons, as necessary, to highlight **Yes**, then press the **ENTER** button. 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, use the **UP** and **DOWN** buttons, as necessary, to highlight **No**, then press the **ENTER** button to return to the Main Menu.

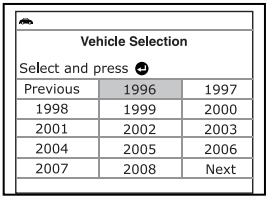
USING THE DLC LOCATOR

1. Use the **UP** and **DOWN** buttons, as necessary, to highlight **DLC Locator** in the **Main Menu**, then press the **ENTER** button.

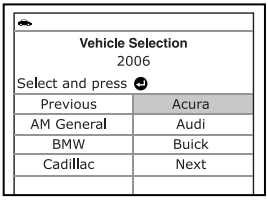


   - The Select Vehicle Model Year screen displays.

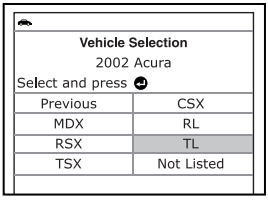
2. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired vehicle model year, then press the **ENTER** button.



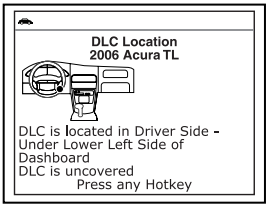
- The Select Vehicle Manufacturer screen displays.



3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle manufacturer, then press the **ENTER** ↵ button.
   - The Select Vehicle Model screen displays.



4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired model, then press the **ENTER** ↵ button.
   - 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.



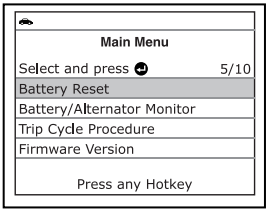
5. When you have finished viewing the DLC location, press any hotkey to exit the DLC Locator.

BATTERY RESET

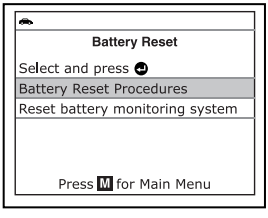
You can use the Code Reader to view the procedures for resetting the battery monitor system following battery replacement or perform battery reset OBD service (for BMW, Ford and Volvo models only).

To view battery reset procedures:

1. While linked to a vehicle, press the **M** button.
   - The Main Menu displays.

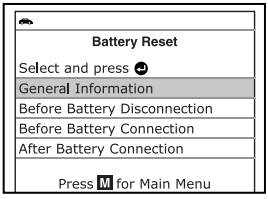


2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Battery Reset**, then press the **ENTER** ↵ button.
   - The Battery Reset menu displays.

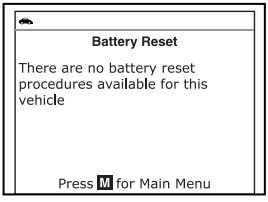


3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Battery Reset Procedures**, then press the **ENTER** ↵ button.

- The Battery Reset Procedures menu displays. The menu provides access to **General Information**, and procedures to be followed **Before Battery Disconnection**, **Before Battery Connection**, and **After Battery Connection**.

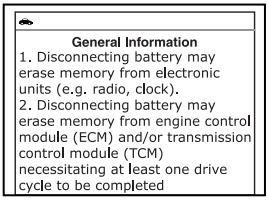


*If battery reset procedures are not available for your vehicle, an advisory message shows on the Code Reader's display. Press the **M** button to return to the Main Menu.*



4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the procedure you wish to view, then press the **ENTER** ↵ button.

   - The selected procedure displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire procedure.



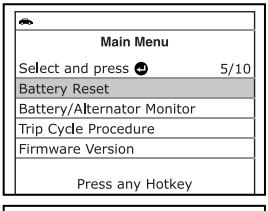
5. When you have finished viewing the retrieved information, press the **M** button to return to the Main Menu. Repeat steps **2** through **4** to view additional procedures.

To perform battery reset OBD service:

*The **Battery Reset OBD Service** option is available for BMW, Ford and Volvo vehicles only.*

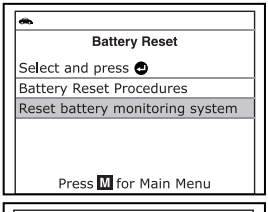
1. While linked to a vehicle, press the **M** button.

   - The Main Menu displays.



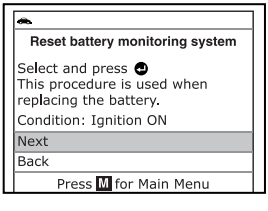
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Battery Reset**, then press the **ENTER** ↵ button.

   - The Battery Reset menu displays.

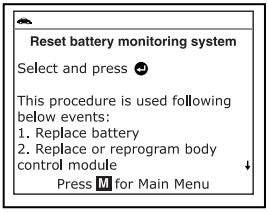


3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Battery Reset OBD Service**, then press the **ENTER** ↵ button.

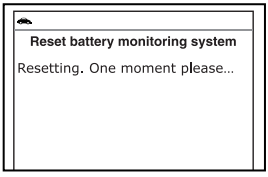
   - An "instructional" message displays.



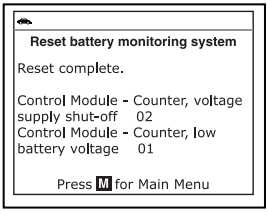
4. Follow the instructions provided to prepare the vehicle for battery reset OBD service. When all necessary procedures have been performed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Next**, then press the **ENTER** ↵ button.
   - A "Live Data" screen displays, if applicable.



5. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Next**, then press the **ENTER** ↵ button.
   - A "One moment please…" message displays while battery reset is in process.



6. If the battery reset process is successful, a "Reset Complete" message displays. Press the **M** button to return to the Main Menu.
   - If the battery reset process is not successful, a "Reset Fail" message displays. Press the **M** button to return to the Main Menu.

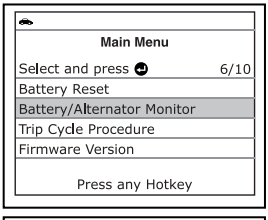


BATTERY/ALTERNATOR MONITOR

The Code Reader 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.

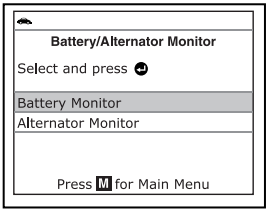
To perform a battery check ONLY:

1. With the Code Reader on the Code Retrieval screen, press and release the **M** button.
   - The Main Menu displays.

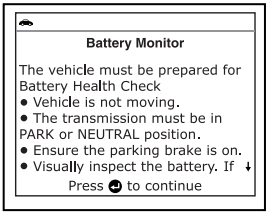


2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Battery/ Alternator Monitor**, then press the **ENTER** ↵ button.
   - The Battery/Alternator Monitor Menu displays.

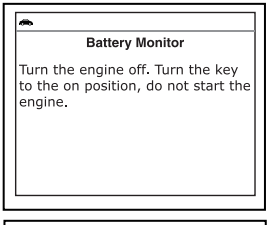
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Battery Monitor**, then press the **ENTER** ↵ button.



- An "instructional" message shows on the Code Reader's display, showing the procedures to prepare the vehicle for the battery check.



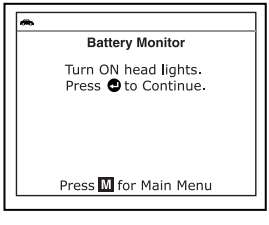
4. Prepare the vehicle for the battery check:
   - Turn the engine off.
   - Place the transmission in PARK or NEUTRAL, and set the parking brake.
   - Make a visual check of the battery's condition. If the battery terminals are corroded or other damage is present, clean or replace the battery as appropriate.
   - 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.



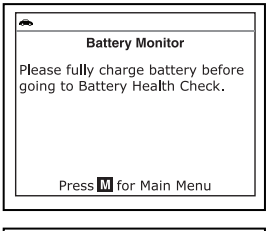
5. Press the **ENTER** ↵ button to begin the battery check.

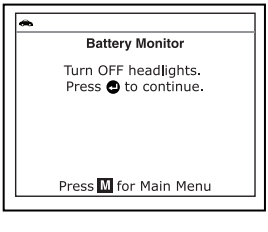
*If the engine is running, an advisory message shows on the Code Reader's display. Turn the engine off, then turn the ignition on. **DO NOT** start the engine. Press the **ENTER** ↵ button to continue.*

   - An "instructional" message shows on the Code Reader's display.



6. Turn the vehicle's headlights on, the press the **ENTER** ↵ button to continue.
   - A "countdown" message shows on the Code Reader's display while the battery check is in process.
   - If battery voltage is *less than* 12.1 volts, an advisory message shows on the Code Reader's display. Press the **M** button to return to the Main Menu. Turn the ignition off and disconnect the Code Reader 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 on the Code Reader's display.





7. Turn the vehicle's headlights off, the press the **ENTER** ↵ button to continue.

- An "instructional" message shows on the Code Reader's display.

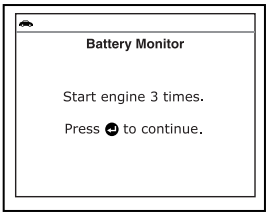
8. Start the vehicle's engine. Allow the engine to run for several seconds, then turn the engine off. Repeat for a total of three "start/stop" cycles.

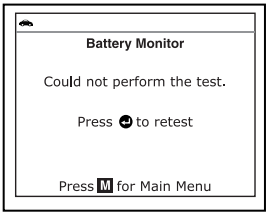
*If the Code Reader did not detect "cranking status" for the vehicle's engine, an advisory message shows on the Code Reader's display. Press the **ENTER** ↵ button to repeat the battery check, or, press the **M** button to return to the Main Menu.*

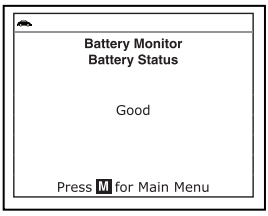
9. When the battery check is complete, a results screen displays the battery status. The System Status LEDs provide a PASS/FAIL indication, as follows:

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

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







To perform a charging system check:

1. With the Code Reader on the Code Retrieval screen, press and release the **M** button.

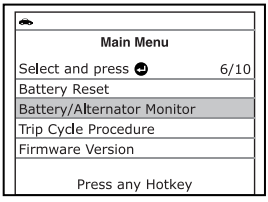
- The Main Menu displays.

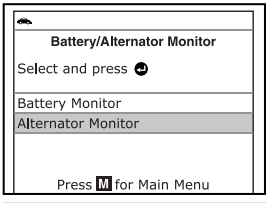
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Battery/Alternator Monitor**, then press the **ENTER** ↵ button.

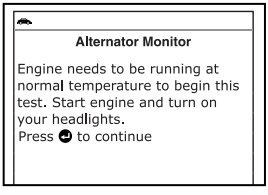
- The Battery/Alternator Monitor Menu displays.

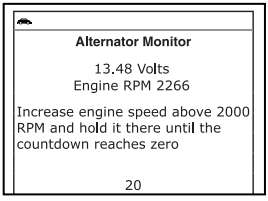
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Alternator Monitor**, then press the **ENTER** ↵ button.

- An "instructional" message shows on the Code Reader's display.

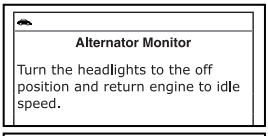




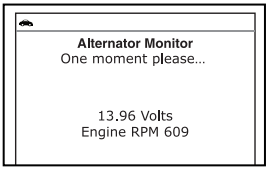




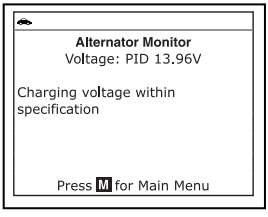
4. Start and warm the engine to normal operating temperature. Turn on the headlights. Press the **ENTER** ↵ button to continue.
   - An "instructional" message shows on the Code Reader's display.



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 the Engine RPM and "countdown" timer.
   - When the "countdown" timer expires, an "instructional" message shows on the Code Reader's display.



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.

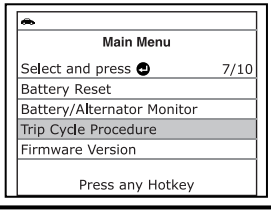


7. When the alternator check is complete, a results screen shows charging system voltage and indicates whether or not the charging system is within acceptable limits. The System Status LEDs provide a PASS/FAIL indication, as follows:
   - Green = System within limits
   - Yellow = Over charging or under 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.
8. Press the **M** button to return to the Main Menu.

VIEWING TRIP CYCLE PROCEDURES

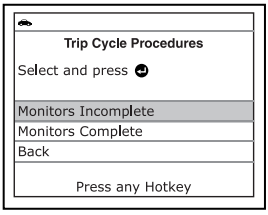
A Trip Cycle for a Monitor requires that the vehicle is driven in such a way that all the required "Enabling Criteria" for the Monitor to run and complete its diagnostic testing are met. You can use the Code Reader to view the Trip Cycle procedures for a selected Monitor.

1. While linked to a vehicle, press the **M** button.
   - The Main Menu displays.



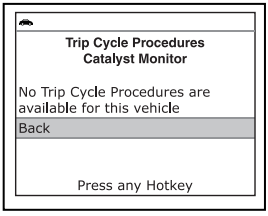
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Trip Cycle Procedures**, then press the **ENTER** ↵ button.

   - A "One moment please…" message displays while the Code Reader retrieves Monitor status from the vehicle's computer.



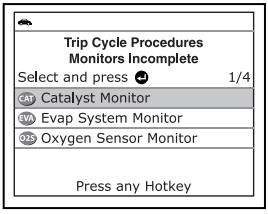
3. When Monitor status has been retrieved, the Trip Cycle Procedures menu displays. Depending on Monitor status, you can view Trip Cycle procedures for **Monitors Incomplete** or **Monitors Complete**.

*If Trip Cycle Procedures are not available for the vehicle, an advisory message shows on the Code Reader's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Back**, then press the **ENTER** ↵ button to return to the Main Menu.*

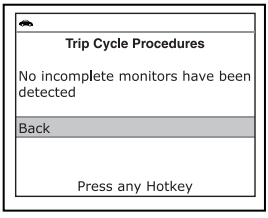


4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Monitors Incomplete** or **Monitors Complete**, as desired, then press the **ENTER** ↵ button.

   - A list of the available Monitors for the selected status displays.



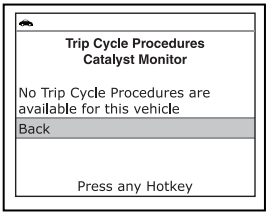
*If no Monitors for the selected status are detected, an advisory message shows on the Code Reader's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Back**, then press the **ENTER** ↵ button to return to the Main Menu.*



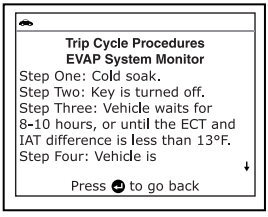
5. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the Monitor for which you wish to view Trip Cycle Procedures, then press the **ENTER** ↵ button.

   - A "One moment please…" message displays while the Code Reader retrieves the requested Trip Cycle Procedure. The Trip Cycle Procedures screen for the Monitor displays when the procedure has been retrieved.

*If a Trip Cycle Procedure for the selected Monitor is not available, an advisory message shows on the Code Reader's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Back**, then press the **ENTER** ↵ button to return to the Main Menu.*



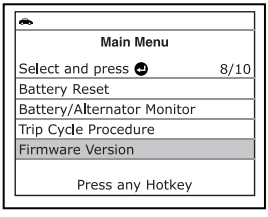
6. The Trip Cycle Procedure screen shows the specific set of operating procedures that ensure the vehicle is driven in such a way that all the required "Enabling Criteria" for the Monitor to run and complete its diagnostic testing are met. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire screen.

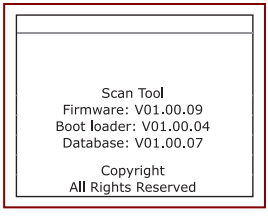


7. When you are finished viewing the Trip Cycle Procedures, press the **ENTER** ↵ button to return to the Trip Cycle Procedures menu, or, press the **M** button to return to the Main Menu.

VIEWING THE FIRMWARE VERSION

1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Firmware Version** in the Main Menu, then press the **ENTER** ↵ button.
   - The Firmware Version screen displays.
   - The screen shows the Code Reader's current firmware version, bootloader version and database version.
2. Press the **M** button to return to the Main Menu.





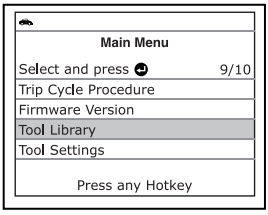
THE TOOL LIBRARY

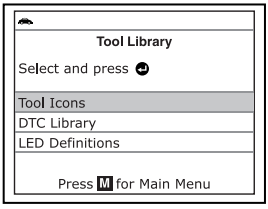
The Tool Library contains valuable reference information for the Code Reader. The following functions are available:

- **Tool Icons** – Shows the full names for the **I/M MONITOR STATUS** icons shown and descriptions of informational icons on the Code Reader's display.

- **DTC Library** – Provides access to libraries of OBD1 and OBD2 DTC definitions.
- **LED Definitions** – Provides descriptions of the meaning of the Code Reader **SYSTEM STATUS** LEDs.

1. While linked to the vehicle, press the **M** button.
   - The Main Menu displays.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Tool Library**, then press the **ENTER** ↵ button.
   - The Tool Library menu displays.

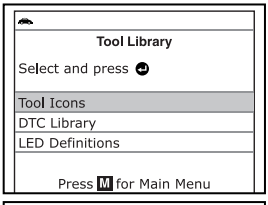


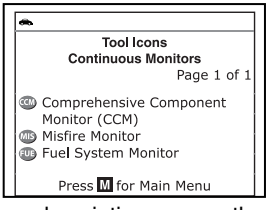


Viewing Tool Icon Descriptions

The **I/M MONITOR STATUS** icons on the Code Reader'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 Code Reader's display.

1. From the Tool Library menu, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Tool Icons**, then press the **ENTER** ↵ button.
   - 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 shown on the Code Reader's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll the list.

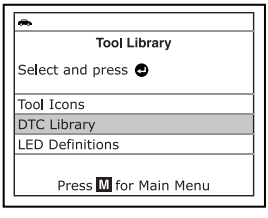




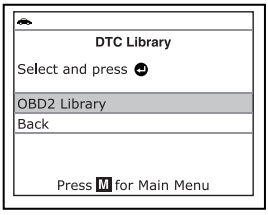
2. When you have finished viewing the tool icon descriptions, press the **M** button to return to the Main Menu.

Using the DTC Library

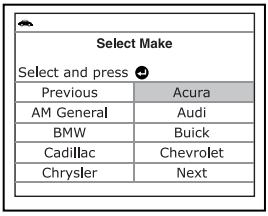
1. From the Tool Library menu, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **DTC Library**, then press the **ENTER** ↵ button.

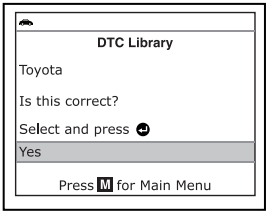


- The Select Library screen displays.

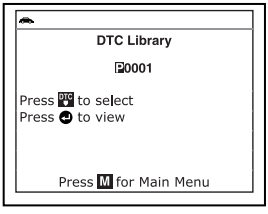


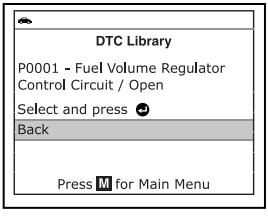
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **OBD2 Library**, then press the **ENTER** ↵ button.
   - The Select Manufacturer screen displays.
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle manufacturer, then press the **DTC/FF** button.
   - A confirmation message shows on the LCD display.
     - If the correct manufacturer is not shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to return to the list of vehicle manufacturers.
     - If the correct manufacturer is shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button.



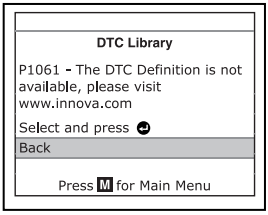


4. The Enter DTC screen displays. The screen shows the code "P0001," with the "P" highlighted. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll to the desired DTC type (P=Powertrain, U=Network, B=Body, C=Chassis), then press the **DTC/FF** button.
   - The selected character displays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



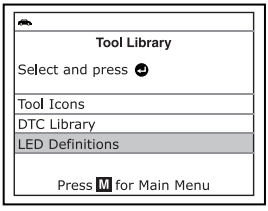


*If a definition for the DTC you entered is not available, an advisory message shows on the Code Reader's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Back**, then press the **ENTER** ↵ button to return to the Enter DTC screen and enter additional DTCs; or, press the **M** button to return to the Main Menu.*

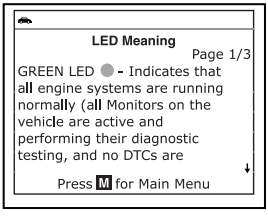


Viewing LED Definitions

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



1. From the Tool Library menu, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **LED Definitions**, then press the **ENTER** ↵ button.
   - The LED Meaning screen displays.
   - The screen provides a description of the meanings of the green, yellow and red **SYSTEM STATUS** LEDs. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll the display.



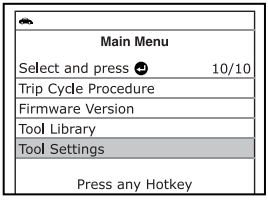
2. When you have finished viewing the LED meanings, press the **M** button to return to the Main Menu.

ADJUSTMENTS, SETTINGS AND LANGUAGE

The Code Reader lets you make several adjustments and settings to configure the Code Reader to your particular needs. It also contains an OBD2 DTC Library that allows you to search for DTC definitions. The following functions, adjustments and settings can be performed when the Code Reader is in "MENU Mode":

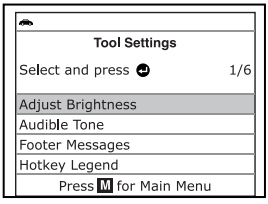
- **Adjust Brightness**: Adjusts the brightness of the display screen.
- **Audible Tone:** Turns the Code Reader's audible tone "on" and "off." When turned "on," a tone sounds each time a button is pressed.
- **Footer Messages**: Turns the navigational "footers" at the bottom of most display screens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

- **Unit of Measurement**: Sets the Unit of Measurement for the Code Reader's display to USA or metric.



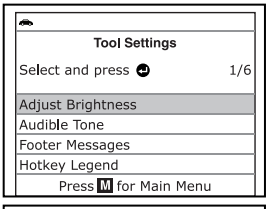
To enter the Tool Settings mode:

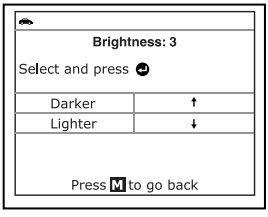
1. While linked to the vehicle, press and release the **M** button.
   - The Main Menu displays.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Tool Settings**, then press the **ENTER** ↵ button.
   - The Tool Setting menu displays.
3. Make adjustments and settings as described in the following paragraphs.



Adjusting Display Brightness

1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Adjust Brightness** in the Tool Settings menu, then press the **ENTER** ↵ button.
   - The Adjust Brightness screen displays.
   - The **Brightness** field shows the current brightness setting, from 1 to 5.
2. Press the **UP** ▲ button to decrease the brightness of the display (make the display darker).
3. Press the **DOWN** ▼ button to increase the brightness of the display (make the display lighter).



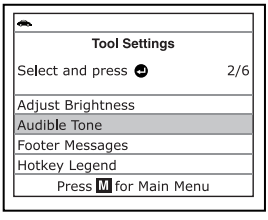


4. When the desired brightness is obtained, press the **ENTER** ↵ button to save your changes and return to the Tool Settings menu.

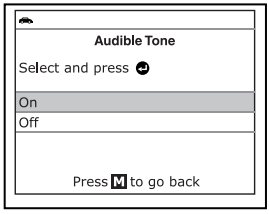
*To exit the Adjust Brightness screen and return to the Tool Settings menu without making changes, press the **M** button.*

Enabling/Disabling the Audible Tone

1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Audible Tone** in the Tool Settings menu, then press the **ENTER** ↵ button.



- The Audible Tone screen displays.

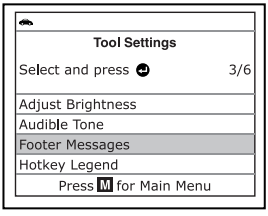


2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **On** or **Off** as desired.
3. When the desired option is selected, press the **ENTER** ↵ button to save your changes and return to the Tool Settings menu.

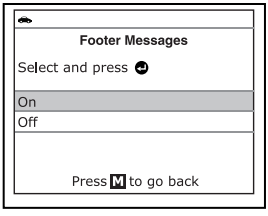
*To exit the Audible Tone screen and return to the Tool Settings menu without making changes, press the **M** button.*

Enabling/Disabling Navigational Footers

Navigational "footers" are shown at the bottom of most display screens. They show which hotkey to press to return to the topmost menu for the current function.



1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Footer Messages** in the Tool Settings menu, then press the **ENTER** ↵ button.
   - The Footer Messages screen displays.

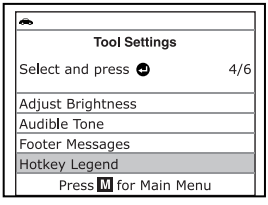


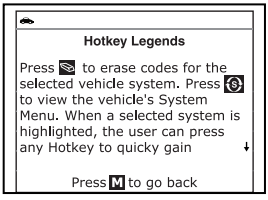
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **On** of **Off** as desired.
3. When the desired option is selected, press the **ENTER** ↵ button to save your changes are return to the Tool Settings menu.

*To exit the Footer Messages screen and return to the Tool Settings menu without making changes, press the **M** button.*

Viewing the Hotkey Legend

1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Hotkey Legend** in the Tool Settings menu, then press the **ENTER** ↵ button.
   - The Hotkey Legend screen displays.
   - The screen shows a functional description of each of the Code Reader's hotkeys.

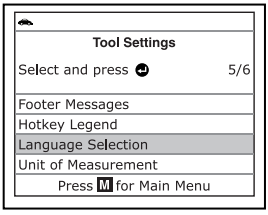


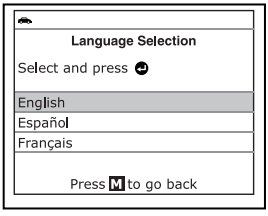


2. When you have finished viewing the Hotkey Legend, press the **ENTER** ↵ button to return to the Tool Settings menu.

Selecting the Display Language

1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Language Selection** in the Tool Settings menu, then press the **ENTER** ↵ button.
   - The Language Selection screen displays.
   - The currently selected display language is highlighted.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired display language.
3. When the desired display language is highlighted, press the **ENTER** ↵ button to save your changes and return to the Tool Settings menu (shown in the selected display language).

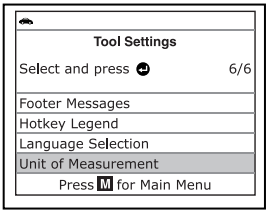


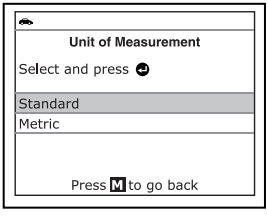


*To exit the Language Selection screen and return to the Tool Settings menu without making changes, press the **M** button.*

Setting the Unit of Measurement

1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Unit of Measurement** in the Tool Settings menu, then press the **ENTER** ↵ button.
   - The Unit of Measurement screen displays.
   - The currently selected unit of measurement is highlighted.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired unit of measurement.
3. When the desired unit of measurement value is selected, press the **ENTER** ↵ button to save your changes and return to the Tool Settings menu.





*To exit the Unit of Measurement screen and return to the Tool Settings menu without making changes, press the **M** button.*

Exiting the MENU Mode

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

OBD UPDATER

Use these procedures to verify your tool's firmware is current, and to perform firmware updates when available.

1. Visit www ZurichDiagnostics.com, download and install the latest version of OBD Updater.
2. Connect your tool to your PC using a Mini USB cable and run the OBD Updater software.
3. Follow the on-screen prompts to install the firmware update.

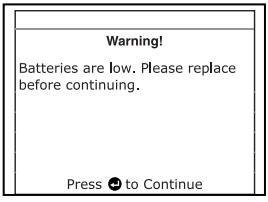
If no update is available, the software displays the message "No updates available."

When you retrieve DTCs from a vehicle, the data is saved to the Code Reader's memory.

Each time you retrieve DTCs, existing data in the Code Reader's memory is overwritten with the new data.

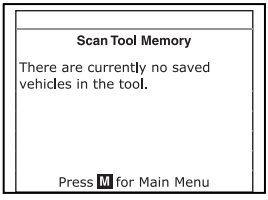
VIEWING DATA IN MEMORY

When you turn the Code Reader on while NOT connected to a vehicle, and data is currently saved in the Code Reader's memory, the Code Reader enters Memory mode. You can view DTCs and Live Data stored in the Code Reader's memory.



1. With the Code Reader NOT connected to a vehicle, press and release the **POWER/LINK** button to turn the Code Reader on.

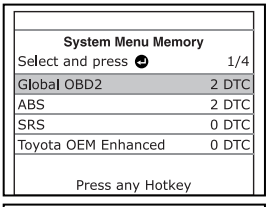
- If the Code Reader's batteries are low, a warning message displays. Replace the batteries before continuing.



2. If more than one vehicle is stored in the Code Reader's memory, the Vehicle Selection menu displays. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired vehicle, then press the **ENTER** button.

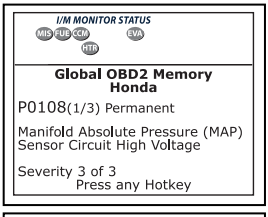
*If there are no vehicles currently stored in the Code Reader, an advisory message displays. Press the **M** button to return to the Main Menu.*

- The Memory System Menu displays.

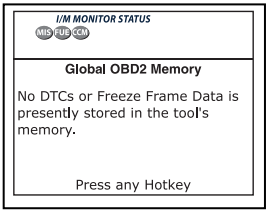


3. Use the **UP** and **DOWN** buttons, as necessary, to highlight the DTCs you wish to view, then press the **ENTER** button.

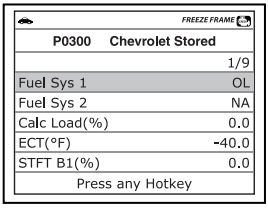
- The Code Reader displays the "priority" DTC.



If there are no DTCs currently stored in the Code Reader's memory, an advisory message shows on the display.



- Press the **DTC/FF** button to scroll through all stored DTCs. Press the **FF** button to view Freeze Frame data for the priority DTC.
- When all DTCs have been displayed and the **DTC/FF** button is pressed, the Code Reader displays the first enhanced DTC stored in memory. Press the **DTC/FF** button to scroll through all stored enhanced DTCs.



4. When you have finished viewing data in the Code Reader's memory, press and release the **POWER/LINK** button to turn the Code Reader off.

The following is a list of Generic (Global) PIDs and their descriptions.

Tool Display	Unit	Value	PID Description
ACC Pedal D	%	XXX.X	Accelerator Pedal Position D
ACC Pedal E	%	XXX.X	Accelerator Pedal Position E
ACC Pedal F	%	XXX.X	Accelerator Pedal Position F
Air Status	-	UPS, DNS, OFF	Commanded Secondary Air Status
Ambient	*C / *F	XXX	Ambient Air Temperature
Aux Input Status	-	On / Off	Auxiliary Input Status
BARO	kPa /inHg	XXX / XX.X	Barometric Pressure
Calc LOAD	%	XXX.X	Calculated LOAD Value
CAT Temp 11	*C / *F	XXXX.X	Catalyst Temperature Bank 1-Sensor 1
CAT Temp 12	*C / *F	XXXX.X	Catalyst Temperature Bank 1-Sensor 2
CAT Temp 21	*C / *F	XXXX.X	Catalyst Temperature Bank 2-Sensor 1
CAT Temp 22	*C / *F	XXXX.X	Catalyst Temperature Bank 2-Sensor 2
Command EGR	%	XXX.X	Commanded EGR
Command EVAP	%	XXX.X	Commanded Evaporative Purge
Command TAC	%	XXX.X	Commanded Throttle Actuator
Dist DTC Clr	km /mile	XXXXX	Distance since DTC Cleared
Dist MIL ON	km /miles	XXXXX	Distance Traveled while MIL ON
ECT	*C / *F	XXX / XXX	Engine Coolant Temp
ECU Volts	V	XX.XXX	Control Module Voltage
EGR Error	%	XXX.X	EGR Error
Eng RPM	min	XXXXX	Engine RPM
EQ Ratio	-	X.XXX	Commanded Equivalence Ratio
EQ Ratio 11	-	X.XXX	Bank 1 - Sensor 1 Equivalence Ratio
EQ Ratio 12	-	X.XXX	Bank 1 - Sensor 2 Equivalence Ratio
EQ Ratio 13	-	X.XXX	Bank 1 - Sensor 3 Equivalence Ratio

Tool Display	Unit	Value	PID Description
EQ Ratio 14	-	X.XXX	Bank 1 - Sensor 4 Equivalence Ratio
EQ Ratio 21	-	X.XXX	Bank 2 - Sensor 1 Equivalence Ratio
EQ Ratio 22	-	X.XXX	Bank 2 - Sensor 2 Equivalence Ratio
EQ Ratio 23	-	X.XXX	Bank 2 - Sensor 3 Equivalence Ratio
EQ Ratio 24	-	X.XXX	Bank 2 - Sensor 4 Equivalence Ratio
EVAP Press	Pa /in H2O	XXXX.XX /XX.XXX	Evap System Vapor Pressure
FP / Vac	kPa /PSI	XXXX.XXX /XXX.X	Fuel Rail Pressure relative toVacuum
Fuel Level	%	XXX.X	Fuel Level Input
Fuel Press	kPa /PSI	XXX / XX.X	Fuel Rail Pressure
Fuel Press	kPa /PSI	XXXXX /XXXX.X	Fuel Rail Pressure
Fuel Sys 1	-	OL	Fuel System 1 Status
Fuel Sys 1	-	CL	Fuel System 1 Status
Fuel Sys 1	-	OL-Drive	Fuel System 1 Status
Fuel Sys 1	-	OL-Fault	Fuel System 1 Status
Fuel Sys 1	-	CL-Fault	Fuel System 1 Status
Fuel Sys 2	-	OL	Fuel System 2 Status
Fuel Sys 2	-	CL	Fuel System 2 Status
Fuel Sys 2	-	OL-Drive	Fuel System 2 Status
Fuel Sys 2	-	OL-Fault	Fuel System 2 Status
Fuel Sys 2	-	CL-Fault	Fuel System 2 Status
IAT	*C / *F	XXX / XXX	Intake Air Temperature
LOAD Value	%	XXX.X	Absolute Load Value
LTFT B1	%	XXX.X	Long Term Fuel Trim-Bank 1
LTFT B2	%	XXX.X	Long Term Fuel Trim-Bank 2
LTFT B3	%	XXX.X	Long Term Fuel Trim-Bank 3
LTFT B4	%	XXX.X	Long Term Fuel Trim-Bank 4
MAF	g/s ;lb/min	XXX.XX /XXXX.X	Air Flow Rate from Mass Air Flow Sensor
MAP	kPa /PSI	XXX / XX.X	Intake Manifold Absolute Pressure
MIL On Time	hrs, min	XXXX, XX	Engine Run Time while MIL ON
Monitor Status	-	ICONS on Display	Monitor Status this Driving Cycle
O2S B1 S1	V	X.XXX	Bank 1 - Sensor 1

Tool Display	Unit	Value	PID Description
O2S B1 S1 mA	mA	X.XXX	Bank 1 - Sensor 1 O2S Current
O2S B1 S1 V	V	X.XXX	Bank 1 - Sensor 1 O2S Voltage
O2S B1 S2	V	X.XXX	Bank 1 - Sensor 2
O2S B1 S2 mA	mA	X.XXX	Bank 1 - Sensor 2 O2S Current
O2S B1 S2 V	V	X.XXX	Bank 1 - Sensor 2 O2S Voltage
O2S B1 S3	V	X.XXX	Bank 1 - Sensor 3
O2S B1 S3 mA	mA	X.XXX	Bank 1 - Sensor 3 O2S Current
O2S B1 S3 V	V	X.XXX	Bank 1 - Sensor 3 O2S Voltage
O2S B1 S4	V	X.XXX	Bank 1 - Sensor 4
O2S B1 S4 mA	mA	X.XXX	Bank 1 - Sensor 4 O2S Current
O2S B1 S4 V	V	X.XXX	Bank 1 - Sensor 4 O2S Voltage
O2S B2 S1	V	X.XXX	Bank 2 - Sensor 1
O2S B2 S1 mA	mA	X.XXX	Bank 2 - Sensor 1 O2S Current
O2S B2 S1 V	V	X.XXX	Bank 2 - Sensor 1 O2S Voltage
O2S B2 S2	V	X.XXX	Bank 2 - Sensor 2
O2S B2 S2 mA	mA	X.XXX	Bank 2 - Sensor 2 O2S Current
O2S B2 S2 V	V	X.XXX	Bank 2 - Sensor 2 O2S Voltage
O2S B2 S3	V	X.XXX	Bank 2 - Sensor 3
O2S B2 S3 mA	mA	X.XXX	Bank 2 - Sensor 3 O2S Current
O2S B2 S3 V	V	X.XXX	Bank 2 - Sensor 3 O2S Voltage
O2S B2 S4	V	X.XXX	Bank 2 - Sensor 4
O2S B2 S4 mA	mA	X.XXX	Bank 2 - Sensor 4 O2S Current
O2S B2 S4 V	V	X.XXX	Bank 2 - Sensor 4 O2S Voltage
O2S Location	-	O2S11	Oxygen Sensor, Bank 1, Sensor 1
O2S Location	-	O2S12	Oxygen Sensor, Bank 1, Sensor 2
O2S Location	-	O2S13	Oxygen Sensor, Bank 1, Sensor 3
O2S Location	-	O2S14	Oxygen Sensor, Bank 1, Sensor 4
O2S Location	-	O2S21	Oxygen Sensor, Bank 2, Sensor 1
O2S Location	-	O2S22	Oxygen Sensor, Bank 2, Sensor 1
O2S Location	-	O2S23	Oxygen Sensor, Bank 2, Sensor 3
O2S Location	-	O2S24	Oxygen Sensor, Bank 2, Sensor 4
O2S Location	-	O2S11	Oxygen Sensor, Bank 1, Sensor 1
O2S Location	-	O2S12	Oxygen Sensor, Bank 1, Sensor 2
O2S Location	-	O2S21	Oxygen Sensor, Bank 2, Sensor 1
O2S Location	-	O2S22	Oxygen Sensor, Bank 2, Sensor 2
O2S Location	-	O2S31	Oxygen Sensor, Bank 3, Sensor 1
O2S Location	-	O2S32	Oxygen Sensor, Bank 3, Sensor 2
O2S Location	-	O2S41	Oxygen Sensor, Bank 4, Sensor 1

Tool Display	Unit	Value	PID Description
O2S Location	-	O2S42	Oxygen Sensor, Bank 4, Sensor 2
OBD Support	-	OBD2	OBD Requirements
OBD Support	-	OBD	OBD Requirements
OBD Support	-	OBD and OBD2	OBD Requirements
OBD Support	-	OBD1	OBD Requirements
OBD Support	-	No OBD	OBD Requirements
OBD Support	-	EOBD	OBD Requirements
OBD Support	-	EOBD and OBD2	OBD Requirements
OBD Support	-	EOBD and OBD	OBD Requirements
OBD Support	-	EOBD, OBD and OBD2	OBD Requirements
OBD Support	-	JOBD	OBD Requirements
OBD Support	-	JOBD and OBD2	OBD Requirements
OBD Support	-	JOBD and EOBD	OBD Requirements
OBD Support	-	JOBD, EOBD and OBD2	OBD Requirements
PTO Status	-	On / Off	Power Take Off Status
Rel TPS	%	XXX.X	Relative Throttle Position
Spark Adv	deg	XX	Ignition Timing Advance #1 Cylinder
STFT B1	%	XXX.X	Short Term Fuel Trim-Bank 1
STFT B1 S1	%	XXX.X	Bank 1 - Sensor 1
STFT B1 S2	%	XXX.X	Bank 1 - Sensor 2
STFT B1 S3	%	XXX.X	Bank 1 - Sensor 3
STFT B1 S4	%	XXX.X	Bank 1 - Sensor 4
STFT B2	%	XXX.X	Short Term Fuel Trim-Bank 2
STFT B2 S1	%	XXX.X	Bank 2 - Sensor 1
STFT B2 S2	%	XXX.X	Bank 2 - Sensor 2
STFT B2 S3	%	XXX.X	Bank 2 - Sensor 3
STFT B2 S4	%	XXX.X	Bank 2 - Sensor 4
STFT B3	%	XXX.X	Short Term Fuel Trim-Bank 3
STFT B4	%	XXX.X	Short Term Fuel Trim-Bank 4
Time DTC Clr	hrs, min	XXXX, XX	Time since DTC Cleared
Time Since Start	sec	XXXX	Time Since Engine Start
TPS	%	XXX.X	Absolute Throttle Position
TPS B	%	XXX.X	Absolute Throttle Position B
TPS C	%	XXX.X	Absolute Throttle Position C

Tool Display	Unit	Value	PID Description
Veh Speed	km/h / mph	XXX / XXX	Vehicle Speed Sensor
Warm-up DTC Clr	-	XXX	# Warm-ups since DTC Cleared

VEHICLE APPLICATIONS – MAKES COVERED

The Code Reader has the ability to retrieve and erase ABS codes. Vehicle Makes supported by the Code Reader are shown below.

Domestic Vehicles	
AM GENERAL	HUMMER
BUICK	JEEP
CADILLAC	LINCOLN
CHEVROLET	MERCURY
CHRYSLER	OLDSMOBILE
DODGE	PONTIAC
FORD	RAM
GENERAL MOTORS	SATURN
GEO	SRT
GMC	

Asian Vehicles	
ACURA	LEXUS
HONDA	NISSAN
HYUNDAI	SCION
INFINITI	TOYOTA
KIA	

European Vehicles	
AUDI	MINI
BMW	SAAB
MERCEDES-BENZ	VOLKSWAGEN
VOLVO	

VEHICLE APPLICATIONS – MAKES COVERED

The Code Reader has the ability to reset the vehicle's Oil Maintenance Light. Vehicle Makes supported by the Code Reader are shown below.

Domestic Vehicles	
AM GENERAL	HUMMER
BUICK	JEEP
CADILLAC	LINCOLN
CHEVROLET	MERCURY
CHRYSLER	OLDSMOBILE
DODGE	PONTIAC
FORD	RAM
GENERAL MOTORS	SATURN
GEO	SRT
GMC	

Asian Vehicles	
ACURA	LEXUS
HONDA	NISSAN
HYUNDAI	SCION
INFINITI	TOYOTA
KIA	

European Vehicles	
AUDI	MINI
BMW	SAAB
MERCEDES-BENZ	VOLKSWAGEN
VOLVO	FIAT

GLOSSARY OF TERMS AND ABBREVIATIONS

ABS – Anti-Lock Brake System

CARB – California Air Resources Board

CCM – Central Control Module

Computer Control System – An electronic control system, consisting of an on-board computer and related sensors, switches and actuators, used to ensure peak performance and fuel efficiency while reducing pollutants in the vehicle's emissions.

DIY – Do-It-Yourself

DLC – Data Link Connector

Drive Cycle – An extended set of driving procedures that takes into consideration the various types of driving conditions encountered in real life.

Driving Condition – A specific environmental or operation condition under which a vehicle is operated; such as starting the vehicle when cold, driving at steady speed (cruising), accelerating, etc.

DTC(s) – Diagnostic Trouble Code(s)

EGR – Exhaust Gas Recirculation

EPA – Environmental Protection Agency

EVAP – Evaporative Emissions System

Fault Code – See DTCs

Freeze Frame – A digital representation of engine and/or emissions system conditions present when a fault code was recorded.

FTP – Fuel Tank Pressure

Generic Code – A DTC that applies to all OBD2 compliant vehicles.

I/M Readiness – An indication of whether or not a vehicle's emissions-related system are operating properly and are ready for Inspection and Maintenance testing.

I/M Test / Emissions Test / Smog Check – A functional test of a vehicle to determine if tailpipe emissions are within Federal/State/Local requirements.

LCD – Liquid Crystal Display

LED – Light Emitting Diode

LTFT – Long Term Fuel Trim, is a program in the vehicle's computer designed to add or subtract fuel from the vehicle to compensate for operating conditions that vary from the ideal A/F ratio (long term).

Manufacturer Specific Code – A DTC that applies only to OBD2 compliant vehicles made by a specific manufacturer.

MIL – Malfunction Indicator Lamp (also referred to as "Check Engine" light

OBD1 – On-Board Diagnostics Version 1 (also referred to as "OBD I")

OBD2 – On-Board Diagnostics Version 2 (also referred to as "OBD II")

On-Board Computer – The central processing unit in the vehicle's computer control system.

PCM – Powertrain Control Module

Pending Code – A code recorded on the "first trip" for a "two-trip" code. If the fault that caused the code to be set is not detected on the second trip, the code is automatically erased.

PID – Parameter Identification

SRS – Supplemental Restraint System

STFT – Short Term Fuel Trim, is a program in the vehicle's computer designed to add or subtract fuel from the vehicle to compensate for operating conditions that vary from the ideal A/F ratio. The vehicle uses this program to make minor fuel adjustments (fine tune) on a short-term basis.

Trip Drive Cycle – Vehicle operation that provides the necessary driving condition to enable a vehicle Monitor to run and complete its diagnostic testing.

VECI – Vehicle Emission Control Information Decal

TROUBLESHOOTING

Q: Why can I not erase some codes?

A: Unlike other codes which can be removed from the vehicle's control module, PERMANENT codes cannot. This holds true regardless of the tool being used or color of the status LED display. PERMANENT codes will automatically erase when the control module no longer detects the fault that originally caused the code.

LIMITED 90 DAY WARRANTY

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

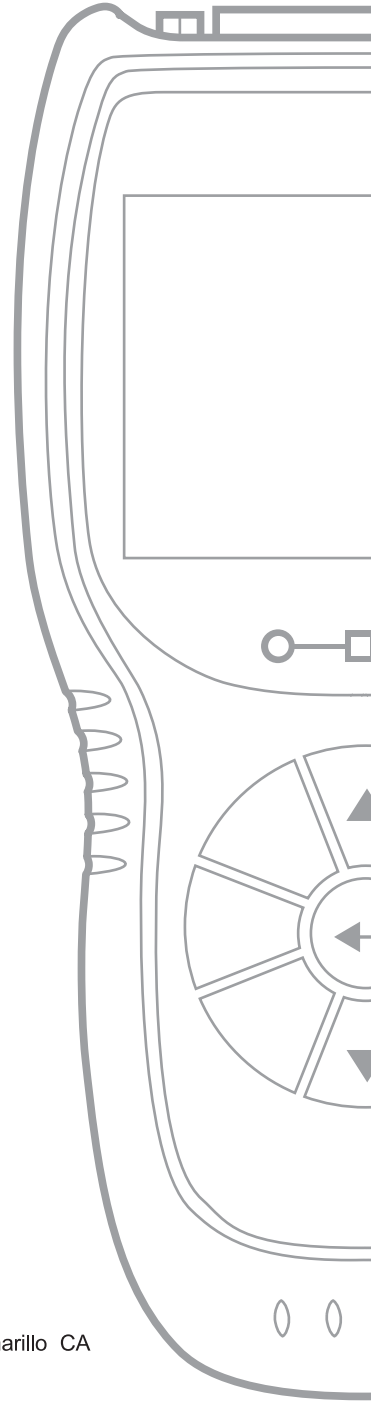
To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

SERVICE PROCEDURES

If you have any questions, require product use or general information please contact:

Harbor Freight Technical Support – 888-866-5797
Web: www.zurichdiagnostics.com



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