7111

Smart Diagnostic System

Global OBD

Custom Scan

Vehicle Diagnostics

Service Reset

OWNER'S MANUAL

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

Table of Contents

SAFETY FIRST!

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

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

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

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

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

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

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

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

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

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

CONTROLS AND INDICATORS
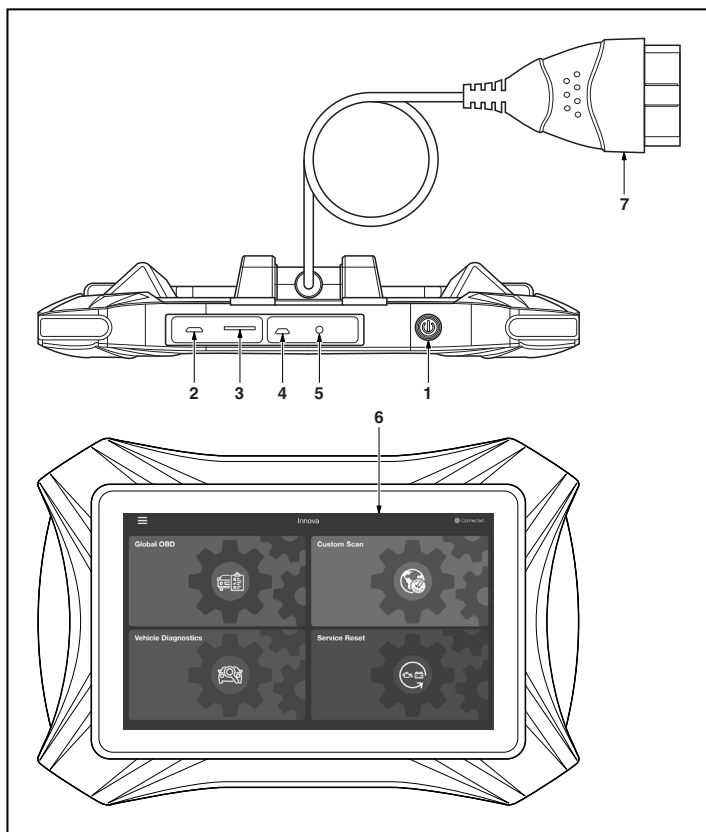
Figure 1. Controls and Indicators

See Figure 1 for the locations of items 1 through 7, below.

1. ⏻ **POWER button** - Turns the tablet "**On**" and "**Off**." When tablet is off, press and hold for approximately 3 seconds to turn on. When tablet is on, press and hold for approximately three seconds to display the "power down" options menu (See Power Up and Power Off on page 3).

2. **USB Port** – Supports charging of the tablet battery using USB cable and power adapter.

3. **TF-Card port** – Supports installation of a TF card (extensible memory card) (functionality is currently disabled).

4. **HDMI port** – Supports connection of an external HDMI (High Definition Multimedia Interface) compatible external display.

5. 🎧 **Headphone port** – Supports connection of external headphones.

6. **Display** - Color LCD display shows menus and submenus, test results, tablet functions and vehicle status information.

7. **Cable** - Connects the tablet to the vehicle's Data Link Connector (DLC).

Power Up and Power Off

To power up the tablet:

1. With the tablet off, press and hold the ⏻ **POWER** button for approximately 3 seconds, then release.

   - The "splash" screen displays the message "LOADING" while the software loads.

   - When the software has been loaded, the Home Page displays (see THE HOME PAGE on page 4).

2. If the tablet is connected to a vehicle, the message "Retrieving vehicle information…" while the table establishes communication with the vehicle.

To restart or power off the tablet:

1. With the tablet on, press and hold the ⏻ **POWER** button for approximately 3 seconds.

   - The "power down" options menu displays at the right side of the screen.

2. To restart the tablet:

   - Tap the ⟳ **Restart** icon.

     - The "splash" screen displays the message "LOADING" while the software loads.

     - When the software has been loaded, the Home Page displays (see THE HOME PAGE on page 4).

   - If the tablet is connected to a vehicle, the message "Retrieving vehicle information…" while the table establishes communication with the vehicle.

3. To power off the tablet:

   - Tap the ⏻ **POWER** icon.

     - The tablet powers down and turns off.

USING THE KEYBOARD

When you tap a text box or data entry field, the keyboard shows at the bottom of the screen. Use the keyboard to enter the required data, as follows:
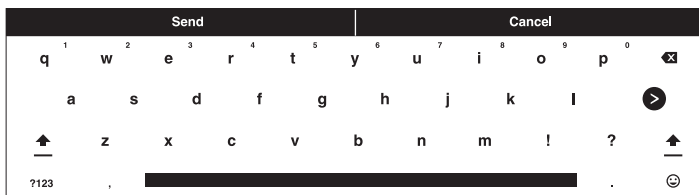
- Tap a letter, number or symbol to enter the character in the text box or data entry field.

- Tap the ⬆ icon to toggle between upper- and lower-case alphabetic characters.

- Tap the **?123** icon to display the numeric characters and standard symbols keyboard.

- Tap the **~ / <** icon to display the secondary symbols keyboard.

- Tap the **ABC** icon to return to the alphabetic keyboard.

- Tap the ⌫ icon to delete previously entered characters.

- Tap the ❯ icon to enter a line feed.

THE HOME PAGE

The Home Page provides access to the primary functional areas of the tablet:
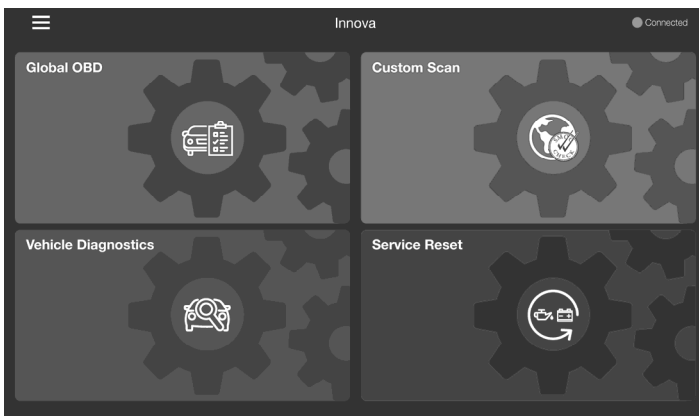
Main Menu – Lets you view test results stored in the tablet's memory, contact Innova Technical Support, locate a vehicle's Data Link Connector (DLC), and configure the tablet for your particular needs (see THE MAIN MENU on page 60).

Global OBD – Lets you perform a Global OBD2 scan of the vehicle under test (see on page).

Custom Scan – Performs a "custom" scan of one or more user-selected modules/systems. See SETTINGS on page 65 to configure **Custom Scan** parameters.

Vehicle Diagnostics – Lets you perform a Network Scan or perform a scan of a single selected module, view Live Data, and/or perform actuator or special tests for the selected module (see on page).

Service Reset –Offers up to seven options for performing service reset procedures (see PERFORMING SERVICE RESETS on page 48).

COMPUTER ENGINE CONTROLS

The Introduction of Electronic Engine Controls

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

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

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

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

■ Respond instantly to supply the proper mixture of air and fuel for any driving condition (idle, cruising, low-speed driving, high-speed driving, etc.).

■ Calculate instantly the best time to "ignite" the air/fuel mixture for maximum engine efficiency.

■ Perform both these tasks without affecting vehicle performance or fuel economy.

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

The Basic Engine Computer Control System

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

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

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

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

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

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

TYPICAL COMPUTER CONTROL SYSTEM

OUTPUT DEVICES
Fuel Injectors
Idle Air Control
EGR Valve
Ignition Module

On-Board Computer

INPUT DEVICES
Coolant Temperature Sensor
Throttle Position Sensor
Fuel Injectors

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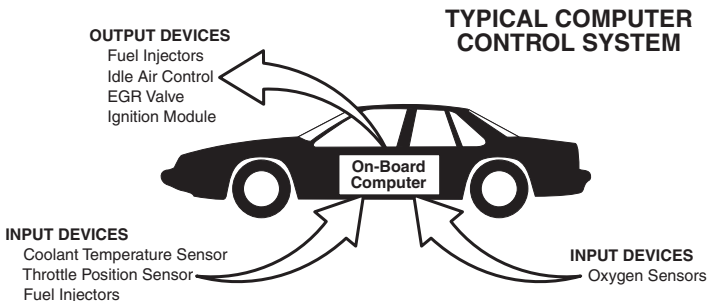
Vehicle operating conditions are constantly changing. The computer continuously makes adjustments or corrections (especially to the air/fuel mixture and spark timing) to keep all the engine systems operating within the preset reference values.

On-Board Diagnostics - First Generation (OBD1)

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

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

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

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

On-Board Diagnostics - Second Generation (OBD2)

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

The OBD2 System is an enhancement of the OBD1 System.

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

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

■ Because OBD1 systems only detect failed components, the degraded components were not setting codes.

■ Some emissions problems related to degraded components only occur when the vehicle is being driven under a load. The emission checks being conducted at the time were not performed under simulated driving conditions. As a result, a significant number of vehicles with degraded components were passing Emissions Tests.

■ Codes, code definitions, diagnostic connectors, communication protocols and emissions terminology were different for each manufacturer. This caused confusion for the technicians working on different make and model vehicles.

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

The Main Objectives of the OBD2 System are:

■ To detect degraded and/or failed emissions-related components or systems that could cause tailpipe emissions to exceed by 1.5 times the Federal Test Procedure (FTP) standard.

■ To expand emissions-related system monitoring. This includes a set of computer run diagnostics called Monitors. Monitors perform diagnostics and testing to verify that all emissions-related components and/or systems are operating correctly and within the manufacturer's specifications.

■ To use a standardized Diagnostic Link Connector (DLC) in all vehicles. (Before OBD2, DLCs were of different shapes and sizes.)

■ To standardize the code numbers, code definitions and language used to describe faults. (Before OBD2, each vehicle manufacturer used their own code numbers, code definitions and language to describe the same faults.)

■ To expand the operation of the Malfunction Indicator Lamp (MIL).

■ To standardize communication procedures and protocols between the diagnostic equipment (Scan Tools, Code Readers, etc.) and the vehicle's on-board computer.

OBD2 Terminology

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

- **Powertrain Control Module (PCM)** - The PCM is the OBD2 accepted term for the vehicle's "on-board computer." In addition to controlling the engine management and emissions systems, the PCM also participates in controlling the powertrain (transmission) operation. Most PCMs also have the ability to communicate with other computers on the vehicle (ABS, ride control, body, etc.).

- **Monitor** - Monitors are "diagnostic routines" programmed into the PCM. The PCM utilizes these programs to run diagnostic tests, and to monitor operation of the vehicle's emissions-related components or systems to ensure they are operating correctly and within the vehicle's manufacturer specifications. Currently, up to fifteen Monitors are used in OBD2 systems. Additional Monitors will be added as the OBD2 system is further developed.

Not all vehicles support all fifteen Monitors.

- **Enabling Criteria** - Each Monitor is designed to test and monitor the operation of a specific part of the vehicle's emissions system (EGR system, oxygen sensor, catalytic converter, etc.). A specific set of "conditions" or "driving procedures" must be met before the computer can command a Monitor to run tests on its related system. These "conditions" are known as "**Enabling Criteria**." The requirements and procedures vary for each Monitor. Some Monitors only require the ignition key to be turned "**On**" for them to run and complete their diagnostic testing. Others may require a set of complex procedures, such as, starting the vehicle when cold, bringing it to operating temperature, and driving the vehicle under specific conditions before the Monitor can run and complete its diagnostic testing.

- **Monitor Has/Has Not Run** - The terms "Monitor has run" or "Monitor has not run" are used throughout this manual. "**Monitor has run**," means the PCM **has** commanded a particular Monitor to perform the required diagnostic testing on a system to ensure the system is operating correctly (within factory specifications). The term "**Monitor has not run**" means the PCM **has not** yet commanded a particular Monitor to perform diagnostic testing on its associated part of the emissions system.

- **Trip** - A Trip for a particular Monitor requires that the vehicle is being driven in such a way that all the required "Enabling Criteria" for the Monitor to run and complete its diagnostic testing are met. The "Trip Drive Cycle" for a particular Monitor begins when the ignition key is turned "**On**." It is successfully completed when all the "Enabling Criteria" for the Monitor to run and complete its diagnostic testing are met by the time the ignition key is turned "**Off**." Since each of the fifteen monitors is designed to run diagnostics and testing on a different part of the engine or emissions system, the "Trip Drive Cycle" needed for each individual Monitor to run and complete varies.

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

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

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

DIAGNOSTIC TROUBLE CODES (DTCs)

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

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

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 manu-facturers. 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

P 0 2 0 1

B - Body
C - Chassis
P - Powertrain
U - Network

0 - Generic
1 - Manufacturer Specific
2 - Generic ("P" Codes) and Manufacturer Specific ("B", "C" and "U" Codes)
3 - Includes both Generic and Manufacturer Specific Codes

Identifies the system where the problem is located. "P" Code systems are listed below. "B", "C" and "U" Code systems will vary.

0 - Fuel and Air Metering; Auxiliary Emission Controls
1 - Fuel and Air Metering
2 - Fuel and Air Metering (injector circuit malfunction only)
3 - Ignition System or Misfire
4 - Auxiliary Emission Control System
5 - Vehicle Speed Control and Idle Control System
6 - Computer Output Circuits
7 - Transmission
8 - Transmission
9 - Transmission
A - Hybrid Propulsion
B - Hybrid Propulsion
C - Hybrid Propulsion

Identifies what section of the system is malfunctioning

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 42, before erasing codes from the computer's memory. If a Diagnostic Tool or Scan Tool is used to erase the codes, Freeze Frame data will also be erased.

OBD2 MONITORS

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

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

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

Continuous Monitors

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

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

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

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

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

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

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

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

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

- Type 1 and Type 3 misfires are two-trip monitor faults. If a fault is sensed on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The MIL is not commanded on at this time. If the fault is found again on the second trip, under similar conditions of engine speed, load and temperature, the computer commands the MIL "On," and the code is saved in its long term memory.

- Type 2 misfires are the most severe type of misfire. When a Type 2 misfire is sensed on the first trip, the computer commands the MIL to light when the misfire is sensed. If the computer determines that a Type 2 misfire is severe , and may cause catalytic converter damage, it commands the MIL to "flash" once per second as soon as the misfire is sensed. When the misfire is no longer present, the MIL reverts to steady "On" condition.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

O2S **Oxygen Sensor Monitor** - The Oxygen Sensor monitors how much oxygen is in the vehicle's exhaust. It generates a varying voltage of up to one volt, based on how much oxygen is in the exhaust gas, and sends the signal to the computer. The computer uses this signal to make corrections to the air/fuel mixture. If the exhaust gas has a large amount of oxygen (a lean air/fuel mixture), the oxygen sensor generates a "low" voltage signal. If the exhaust gas has very little oxygen (a rich mixture condition), the oxygen sensor generates a "high" voltage signal. A 450mV signal indicates the most efficient, and least polluting, air/fuel ratio of 14.7 parts of air to one part of fuel.

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

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

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

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

1. It supplies the catalytic converter with the oxygen it needs to oxidize the carbon monoxide and hydrocarbons left over from the combustion process during engine warm-up.

2. The extra oxygen injected into the exhaust stream also helps the catalytic converter reach operating temperature more quickly during warm-up periods. The catalytic converter must heat to operating temperature to work properly.

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

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

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

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

NOx **NOx Aftertreatment Monitor** - NOx aftertreatment is based on a catalytic converter support that has been coated with a special washcoat containing zeolites. NOx Aftertreatment is designed to reduce oxides of nitrogen emitted in the exhaust stream. The zeolite acts as a molecular "sponge" to trap the NO and NO2 molecules in the exhaust stream. In some implementations, injection of a reactant before the aftertreatment purges it. NO2 in particular is unstable, and will join with hydrocarbons to produce H2O and N2. The NOx Aftertreatment Monitor monitors the function of the NOx aftertreatment to ensure that tailpipe emissions remain within acceptable limits.

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

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

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

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

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

DPF **PM Filter Monitor** - The particulate matter (PM) filter removes particulate matter from the exhaust stream by filtration. The filter has a honeycomb structure similar to a catalyst substrate, but with the channels blocked at alternate ends. This forces the exhaust gas to flow through the walls between the channels, filtering the particulate matter out. The filters are self-cleaning by periodic modification of the exhaust gas concentration in order to burn off the trapped particles (oxidizing the particles to form CO_2 and water). The computer monitors the efficiency of the filter in trapping particulate matter, as well as the ability of the filter to regenerate (self-clean).

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

OBD2 Reference Table

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

A. Monitor Type (how often does the Monitor run; Continuous or Once per trip)

B. Number of trips needed, with a fault present, to set a pending DTC

C. Number of consecutive trips needed, with a fault present, to command the MIL "On" and store a DTC

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

E. Number and type of trips or drive cycles needed, with no faults present, to turn off the MIL

F. Number of warm-up periods needed to erase the DTC from the computer's memory after the MIL is turned off

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

CONNECTING THE TABLET

1. Turn the ignition off.

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

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

> *If the tablet is ON, turn it OFF BEFORE connecting to the DLC (see Power Up and Power Off on page 3).*

3. Connect the tablet to the vehicle's DLC. The cable connector is keyed and will only fit one way.

■ If you have problems connecting the cable to the DLC, rotate the connector 180°.

■ If you still have problems, check the DLC on the vehicle and on the tablet.

4. Turn the tablet on (see Power Up and Power Off on page 3).
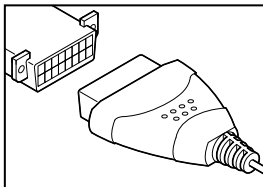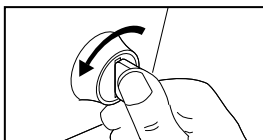
SCANNING A VEHICLE

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

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

> *Check your vehicle thoroughly before performing any test.*

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

Refer to the appropriate paragraph for the Code Retrieval Procedure you wish to perform:

■ **Global OBD2** – see Using Global OBD2 on page 23

■ **Custom Scan** – see Performing a Custom Scan on page 24

Using Global OBD2

1. Verify the tablet is properly connected to the vehicle and powered on (see CONNECTING THE TABLET on page 23).

2. Turn the ignition ON. **DO NOT** start the engine.

3. Tap **Global OBD**.

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

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

- If the Scan Tool fails to link to the vehicle's computer, a "Scan Failed" message shows.

  - Ensure the vehicle is OBD2 compliant.

  - Verify the connection at the DLC, and verify the ignition is ON.

  - Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.

  - Tap **Try Again** to try again, or, tap **Cancel** to return to the Home Page.

4. A progress dialog displays while the tablet retrieves any Diagnostic Trouble Codes, Monitor Status and Freeze Frame Data from the vehicle's computer memory.

5. When the retrieval process is complete, the **Mileage** dialog displays.

- Tap the **Mileage** field to display the keyboard.

- Enter the mileage shown on the vehicle's odometer (see USING THE KEYBOARD on page 4), then tap **Submit**.

6. The Global OBD2 screen displays the results of the scan (see VIEWING SCAN RESULTS on page 25).

Performing a Custom Scan

1. Verify the tablet is properly connected to the vehicle and powered on (see CONNECTING THE TABLET on page 23).

2. Verify Custom Scan options are configured as desired (see SETTINGS on page 65).

3. Turn the ignition ON. **DO NOT** start the engine.

4. Tap **Custom Scan**.

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

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

■ If the Scan Tool fails to link to the vehicle's computer, a "Scan Failed" message shows.

- Ensure the vehicle is OBD2 compliant.

- Verify the connection at the DLC, and verify the ignition is ON.

- Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.

- Tap **Try Again** to try again, or, tap **Cancel** to return to the Home Page.

6. A progress dialog displays while the tablet retrieves any Diagnostic Trouble Codes, Monitor Status and Freeze Frame Data from the vehicle's computer memory.

7. When the retrieval process is complete, the **Mileage** dialog displays.

■ Tap the **Mileage** field to display the keyboard.

■ Enter the mileage shown on the vehicle's odometer (see USING THE KEYBOARD on page 4), then tap **Submit**.

8. The Custom Scan screen displays the results of the scan (see VIEWING SCAN RESULTS on page 25).

VIEWING SCAN RESULTS

Scan results are shown immediately following completion of a scan, and can also be viewed at a later date using the **History** function available through the Main Menu (see THE HISTORY PAGE on page 62).

Scan results are shown in a multi-page display. The content of the scan results display depends on the type of scan performed.

■ **Global OBD** – The **Global OBD** results screen includes the **Global OBD**, **Scheduled Maintenance**, **Predicted Failures** and **TSBs and Recalls** pages.

| ☰ | Global OBD   Scheduled Maintenance   Predicted Failures   TSBs and Recalls | ⌂ |
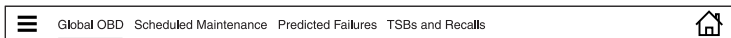
■ **Custom Scan** - The **Custom Scan** results screen includes the **Overview**, **Failed Modules**, **Passed Modules**, **Scheduled Maintenance**, **Predicted Failures** and **TSBs and Recalls** pages.

| ☰ | Overview   Failed Modules   Passed Modules   Scheduled Maintenance   Predicted Failures   TSBs and Recalls | ⌂ |

Certain fields and pages require that you create a RepairSolutions report to access, download and display the associated data. A RepairSolutions "Create Report" message is shown where applicable (see Creating a RepairSolutions Report on page 36).

Global OBD

The **Report ID**, vehicle description (year/make/model), last six digits of the (Vehicle Identification Number) (**VIN**) and the odometer reading (**ODO**) at the time the scan was performed are shown at the top of the screen. Click the ∨ icon to view additional vehicle information and customer information (see Viewing Vehicle Information and Customer Information on page 35).

The **Global OBD** page provides the following information.

■ **Emission Readiness:** Indicates whether or not the vehicle is ready for an Emissions Test (Smog Check), The **Emission Readiness** field is color-coded to provide a visual indication of Emission Test readiness status:

Green - Indicates all engine systems are operating normally. The vehicle is ready for an Emissions Test (Smog Check), and there is a good possibility it can be certified.

Yellow – Indicates one of the following two conditions is present:

- A "Pending" Diagnostic Trouble Code is present. It is possible the vehicle can be tested for emissions and certified. Many areas (states / countries) allow an Emissions Test to be performed if the only code present is a "PENDING" code.

- One or more monitors "have not run" their diagnostic testing. The issue of the vehicle being ready for an Emissions Test will depend on the emissions regulations and laws of your local area.

  Some areas require that all Monitors indicate a "Has Run" status before an Emissions Test (Smog Check) can be performed. Other areas only require that some, but not all, Monitors indicate a "Has Run" status before an Emissions Test can be performed.

Red - Indicates there is a problem with one or more of the vehicle's systems, and Diagnostic Trouble Code(s) (DTCs) are present. The vehicle is not ready for an Emissions Test. The problem(s) that caused the DTCs to set must be repaired before an Emissions Test can be performed.

■ **Primary DTC:** Shows the "priority" code. This is the code that has commanded the vehicle's Malfunction Indicator Lamp (MIL) "on," and is the code for which Freeze Frame data stored. This field includes the DTC number, description, and MIL status.

Primary DTC		
P0101	MAF SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM	MIL ON ●
Freeze Frame	OBD Modes	

- In OBD2 systems, when an emissions-related engine malfunction occurs that causes a DTC to set, a record or snapshot of engine conditions at the time that the malfunction occurred is also saved in the vehicle's computer memory. The record saved is called Freeze Frame data. Saved engine conditions can include, but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate, and intake manifold pressure. Tap the **Freeze Frame** button to view Freeze Frame data.

Freeze Frame			
Fuel Sys 1	**N/A**	**Fuel Sys 2**	**N/A**
Fuel System 1 Status 1		Fuel System 2 Status 2	
Calc Load	**0.0 %**	**ECT**	**-40°F**
Calculated LOAD Value		Engine Coolant Temp	

- Tap the **OBD Modes** button to perform additional OBD Mode Tests for the vehicle (see OBD MODE TESTS on page 48).

■ **Fix for DTCs:** Shows the most likely fix(es) for the "priority DTC, as available, including major parts required and projected parts cost. Tap the **Buy Parts** button to open the web page for the default **Retailer** specified for your tablet. The retailer's web page displays in an additional browser window.

Fix for DTCs	
Most Likely Fix (1 possible fix)	
Replace Mass Air Flow (MAF) Sensor	
Mass Air Flow Sensor	$242
Buy Parts	

*The default **Retailer** for your tablet is defined using the **Settings** function (see SETTINGS on page 65).*

■ **Monitor Status:** Shows the current status (**Complete** or **Not Complete**) for all Monitors supported by the vehicle. Tap the **View Drive Cycles** button to view the Drive Cycle procedures for a selected Monitor (see VIEWING DRIVE CYCLE PROCEDURES on page 60).

Monitor Status		
MIS Complete	**FUE** Complete	**CCM** Complete
EGR Not Complete	**CAT** Not Complete	
EVA Not Complete	**O2S** Not Complete	
HTR Not Complete		
View Drive Cycles		

■ **Stored DTC:** Shows all stored powertrain DTCs for the vehicle. Each entry in the list include the DTC number and description. The "priority" DTC is listed first.

■ **Pending DTC:** Shows all pending powertrain DTCs for the vehicle. Each entry in the list include the DTC number and description.

■ **Permanent DTC:** Shows all "permanent" powertrain DTCs for the vehicle. Each entry in the list include the DTC number and description.

Stored DTC	
P010	MAF SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM
P106E	Direct Pressure Drive Line No3 Line Open
P1070	No. 1 Fuel Heater Circuit Short

Pending DTC	
P0133	HO2S (A/F SENSOR) B1 S1 SLOW RESPONSE
P0233	Fuel Pump Secondary Circuit Intermittent

Permanent DTC	
P2080	Exhaust Gas Temperature Sensor Circuit Range/Performance Bank 1 Sensor 1
P0400	Exhaust Gas Recirculation Flow

Overview
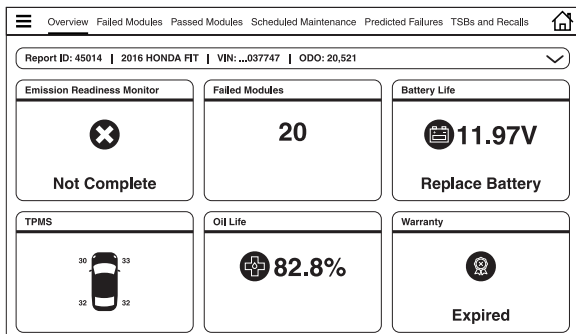
The **Report ID**, vehicle description (year/make/model), last six digits of the (Vehicle Identification Number) (**VIN**) and the odometer reading (**ODO**) at the time the scan was performed are shown at the top of the screen. Click the ⌄ icon to view additional vehicle information and customer information (see Viewing Vehicle Information and Customer Information on page 35).

The **Overview** page provides a general overview of vehicle status for up to 11 categories, as follows:

■ **Emission Readiness Monitor:** Indicates whether or not the vehicle is ready for an Emissions Test (Smog Check), The **Emission Readiness Monitor** field is color-coded to provide a visual indication of Emission Test readiness status:

Green - Indicates all engine systems are operating normally. The vehicle is ready for an Emissions Test (Smog Check), and there is a good possibility it can be certified.

Yellow – Indicates one of the following two conditions is present:

- A "Pending" Diagnostic Trouble Code is present. It is possible the vehicle can be tested for emissions and certified. Many areas

(states / countries) allow an Emissions Test to be performed if the only code present is a "PENDING" code.

- One or more monitors "have not run" their diagnostic testing. The issue of the vehicle being ready for an Emissions Test will depend on the emissions regulations and laws of your local area.

    Some areas require that all Monitors indicate a "Has Run" status before an Emissions Test (Smog Check) can be performed. Other areas only require that some, but not all, Monitors indicate a "Has Run" status before an Emissions Test can be performed.

Red - Indicates there is a problem with one or more of the vehicle's systems, and Diagnostic Trouble Code(s) (DTCs) are present. The vehicle is not ready for an Emissions Test. The problem(s) that caused the DTCs to set must be repaired before an Emissions Test can be performed.

■ **Failed Modules:** Indicates the total number of modules that failed diagnostic testing. The **Failed Modules** field is color-coded to provide a visual indication of module status: Green = good; Yellow = poor; Red = bad.

■ **Battery Life:** Indicates the current battery charge voltage, and whether or not the battery requires replacement. The **Battery Life** field is color-coded to provide a visual indication of battery status status: Green = good; Yellow = poor; Red = bad.

■ **TPMS:** Shows the status of the vehicle Tire Pressure Monitoring System (TMPS) and the individual tire pressures for all vehicle tires. The **TMPS** field is color-coded to provide a visual indication of tire pressure status: Green = good; Yellow = poor; Red = bad.

■ **Oil Life:** Shows the current oil life for the vehicles lubricating oil as a percentage of 100. The **Oil Life** field is color-coded to provide a visual indication of oil life status: Green = good; Yellow = poor; Red = bad.

■ **Warranty:** Indicates the current status of the vehicle warranty. The **Warranty** field is color-coded to provide a visual indication of vehicle warranty status: Green = **Active**; Yellow = **Near Expiration**; Red = **Expired**.

■ **Predicted Failures:** Shows the total number of predicted failures (components and systems that may experience a failure) within the next 12 month period (see on page). The **Predicted Failures** field is color-coded to provide a visual indication of predicted failure status: Green = good; Yellow = poor; Red = bad.

■ **Passed Modules:** Shows the total number of modules that passed diagnostic testing. The **Passed Modules** field is color-coded to provide a visual indication of predicted failure status: Green = good; Yellow = poor; Red = bad.

■ **Oil Level:** Shows the vehicle's current oil level, in inches. The **Oil Level** field is color-coded to provide a visual indication of current oil level status: Green = good; Yellow = poor; Red = bad.

■ **Recalls:** Shows the total number of National Highway Traffic Safety Administration (NHTSA) recalls issued for the vehicle. Tap **TSBs and Recalls** in the page header to open the **TSBs and Recalls** page and view the full content for NHTSA Recalls issued for the vehicle (see TSBs and Recalls on page 34).

■ **TSBs:** Shows the total number of Technical Service Bulletins (TSBs) issued for the vehicle. Tap **TSBs and Recalls** in the page header to open the **TSBs and Recalls** page and view the full content for TSBs issued for the vehicle (see TSBs and Recalls on page 34).

Failed Modules

The **Report ID**, vehicle description (year/make/model), last six digits of the (Vehicle Identification Number) (**VIN**) and the odometer reading (**ODO**) at the time the scan was performed are shown at the top of the screen. Click the ⌄ icon to view additional vehicle information and customer information (see Viewing Vehicle Information and Customer Information on page 35).

The **Failed Modules** page provides a **Powertrain** section, and separate sections for each module included in the scan for which one or more Diagnostic Trouble Codes (DTCs) are present. Click the ⌄ icon to view all available information for the powertrain. The **Powertrain** section provides the following information.

■ **Emission Readiness:** Indicates whether or not the vehicle is ready for an Emissions Test (Smog Check), The **Emission Readiness** field is color-coded to provide a visual indication of Emission Test readiness status:

Green - Indicates all engine systems are operating normally. The vehicle is ready for an Emissions Test (Smog Check), and there is a good possibility it can be certified.

Yellow – Indicates one of the following two conditions is present:

- A "Pending" Diagnostic Trouble Code is present. It is possible the vehicle can be tested for emissions and certified. Many areas (states / countries) allow an Emissions Test to be performed if the only code present is a "PENDING" code.

- One or more monitors "have not run" their diagnostic testing. The issue of the vehicle being ready for an Emissions Test will depend on the emissions regulations and laws of your local area.

  Some areas require that all Monitors indicate a "Has Run" status before an Emissions Test (Smog Check) can be performed. Other areas only require that some, but not all, Monitors indicate a "Has Run" status before an Emissions Test can be performed.

Red - Indicates there is a problem with one or more of the vehicle's systems, and Diagnostic Trouble Code(s) (DTCs) are present. The vehicle is not ready for an Emissions Test. The problem(s) that caused the DTCs to set must be repaired before an Emissions Test can be performed.

■ **Primary DTC:** Shows the "priority" code. This is the code that has commanded the vehicle's Malfunction Indicator Lamp (MIL) "on," and is the code for which Freeze Frame data stored. This field includes the DTC number, description, and MIL status.

Primary DTC		
P0101	MAF SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM	MIL ON ●
Freeze Frame **OBD Modes**		

- In OBD2 systems, when an emissions-related engine malfunction occurs that causes a DTC to set, a record or snapshot of engine conditions at the time that the malfunction occurred is also saved in the vehicle's computer memory. The record saved is called Freeze Frame data. Saved engine conditions can include, but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate, and intake manifold pressure. Tap the **Freeze Frame** button to view Freeze Frame data for the "priority" DTC.

Freeze Frame			
Fuel Sys 1 Fuel System 1 Status 1	N/A	**Fuel Sys 2** Fuel System 2 Status 2	N/A
Calc Load Calculated LOAD Value	0.0 %	**ECT** Engine Coolant Temp	-40°F

- Tap the **OBD Modes** button to perform additional OBD Mode Tests for the vehicle (see OBD MODE TESTS on page 48).

■ **Fix for DTCs:** Shows the most likely fix(es) for the "priority DTC, as available, including major parts required and projected parts cost. Tap the **Buy Parts** button to open the web page for the default **Retailer** specified for your tablet. The retailer's web page displays in an additional browser window.

Fix for DTCs

Most Likely Fix (1 possible fix)
Replace Mass Air Flow (MAF) Sensor

Mass Air Flow Sensor $242

Buy Parts

*The default **Retailer** for your tablet is defined using the **Settings** function (see SETTINGS on page 65).*

■ **Monitor Status:** Shows the current status (**Complete** or **Not Complete**) for all Monitors supported by the vehicle. Tap the **View Drive Cycles** button to view the Drive Cycle procedures for a selected Monitor (see VIEWING DRIVE CYCLE PROCEDURES on page 60).

Monitor Status

MIS Complete   **FUE** Complete   **CCM** Complete

EGR Not Complete   **CAT** Not Complete

EVA Not Complete   **O2S** Not Complete

HTR Not Complete

View Drive Cycles

■ **Stored DTC:** Shows all stored powertrain DTCs for the vehicle. Each entry in the list include the DTC number and description. The "priority" DTC is listed first.

Stored DTC

P010   MAF SENSOR CIRCUIT
                  RANGE/PERFORMANCE PROBLEM

P106E   Direct Pressure Drive Line No3 Line Open

P1070   No. 1 Fuel Heater Circuit Short

■ **Pending DTC:** Shows all pending powertrain DTCs for the vehicle. Each entry in the list include the DTC number and description.

Pending DTC

P0133   HO2S (A/F SENSOR) B1 S1 SLOW
                                       RESPONSE

P0233   Fuel Pump Secondary Circuit
                                   Intermittent

■ **Permanent DTC:** Shows all "permanent" powertrain DTCs for the vehicle. Each entry in the list include the DTC number and description.

Permanent DTC

P2080   Exhaust Gas Temperature Sensor Circuit
                  Range/Performance Bank 1 Sensor 1

P0400   Exhaust Gas Recirculation Flow

A separate section is shown for each module for which one or more Diagnostic Trouble Codes (DTCs) are present. Click the ⌄ icon for a module to view a list of DTCs for the module. Each entry in the list shows the **DTC** number, DTC **Status** (**Confirmed**, **Pending** or **Temporary**) and DTC description.

ABS   ⌄

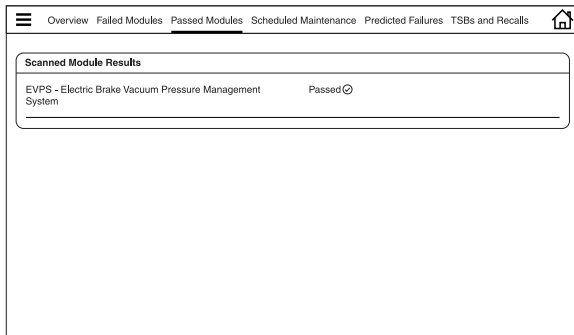| DTC	Status	ABS ●
U0029-00	Confirmed	1. CAN Communication Failure (Bus OFF) 2. CAN Communication Failure (Bus OFF Channel 1)
C0077-78	Confirmed	1. Low Tire Air Pressure 2. Low Tyre Air Pressure

Passed Modules

The **Passed Modules** page shows a listing of modules for which no DTCs are currently stored.

Scheduled Maintenance

The **Scheduled Maintenance** page provides a listing of scheduled maintenance procedures due at the next service interval. The **Next Service** field shows the odometer reading at which the associated service procedures are due.
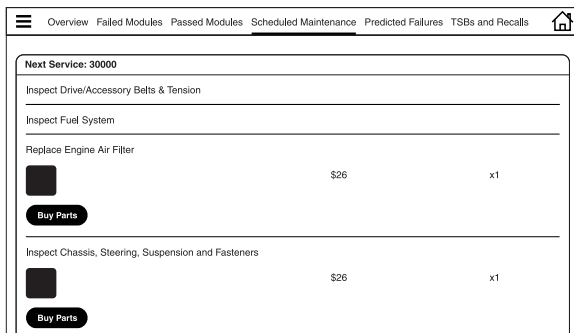
Each entry in the list shows a scheduled inspection or repair/replacement procedure. In cases of replacement procedures, the entry shows the required replacement part(s), the "per unit" part cost, and the number of parts required for the procedure.

Tap the **Buy Parts** button to access the web page for your preferred parts supplier.

*The tablet uses the value entered in the **Retailer** section of the **Settings** page to determine your preferred parts supplier (see SETTINGS on page 65).*

Predicted Failures

The **Predicted Failure** page provides a listing of components and systems that may experience a failure within the next 12 month period.

Overview Failed Modules Passed Modules Scheduled Maintenance Predicted Failures TSBs and Recalls

Predicted Failure(s) within 12 months	Probability of Failure	Price
Replace Catalytic Converter(s) with new OE Catalytic Converter(s)	57%	$737.18
Inspect for Loose Fuel Cap and Tighten or Replace as Necessary	10%	$69.33
Replace Ignition Coil(s)	7%	$130.90

Each entry in the list provides the following information:

■ **Predicted Failure(s) within 12 months:** A brief description of the predicted failure/repair/maintenance procedure required.

■ **Probability of Failure:** Expressed as a percentage of 100; shows a bar graph and numerical value.

■ **Price:** Estimated cost to accomplish the associated repair/ maintenance procedure.

TSBs and Recalls

The **TSBs and Recalls** page provides a listing of all Technical Service Bulletins (TSBs) and Recalls issued against the vehicle.

Overview Failed Modules Passed Modules Scheduled Maintenance Predicted Failures TSBs and Recalls

NHTSA Recalls ❷

Accessories and Fluids TSBs ❹

Body TSBs ⓴

Brake TSBs ❶

Cooling TSBs ❶

Note: Some recalls might have already been completed for this vehicle. Please consult with your local dealership for more information.

TSBs and Recalls are grouped in categories (**NHTSA Recalls**, **Body TSBs**, **Electrical TSBs**, **Factory Recalls**, etc.). The number of items in each category is shown following the category name.

Tap the ⌃ icon for a category to expand the category and view the full text of the associated TSBs or recalls.

Some TSBs and/or recalls for the vehicle may have already been accomplished.

Viewing Vehicle Information and Customer Information

The **Additional Vehicle Information** and **Customer Information** fields are accessed from **Global OBD**, **Overview** or **Failed Modules** page of the scan results screen (see VIEWING SCAN RESULTS on page 25).

```
Report ID: 45014 | 2016 HONDA FIT | VIN:...037747 | ODO: 20,521          ⌄

Additional Vehicle Information              Customer Information              ✎
VIN: JHMGK5H59GX037747                      Date/Time: 09/18/20  9:17 AM
YMME: 2016 HONDA FIT L4, 1.5L; DOHC; 16V; DI First Name: Phil
Module No: $18DAF110 | $18DAF11D            Last Name: Turnbull
CalID: 37805-R40-A550 | 37806-R40-A540      Phone: (999) 555-1212
CVN: D7 52 60 98 | 66 A8 73 42              Email: me@me.com

   View IPT
```

The **Additional Vehicle Information** field shows the following information:

- **VIN**: The complete Vehicle Identification Number

- **YMME**: The vehicle's year, make, model and engine size

- **Module No:** The control module identification number(s)

- **CalID**: The vehicle's calibration ID(s). These IDs uniquely identify the software version(s) for the vehicle's control module(s).

- **CVN**: 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.

The **Customer Information** fields shows the **Date/Time** at which the scan was run, and the **First Name**, **Last Name**, **Phone** number and **Email** address of the vehicle owner.

Tap the **View IPT** button to view In-use Performance Tracking (IPT) statistics (see VIEWING IN-USE PERFORMANCE TRACKING (IPT) on page 51).

Tap the ✎ icon to edit the content of the **Customer Information** fields (see Editing Customer Information, below).

Editing Customer Information

The **First Name**, **Last Name**, **Phone** and Email fields initially contain the value "**N/A**." You can edit **Customer Information** as desired.

```
Enter Customer Information

First Name   [                ]

Last Name    [                ]

Phone        [                ]

Email        [                ]

      Save              Cancel
```

1. Tap the ✎ icon to display the Edit Customer Information fields.

2. Tap the field you wish to edit, then enter the desired value using the keyboard (see USING THE KEYBOARD on page 4).

   - Enter the **Phone** number (including area code) as a 10-digit number, *without* spaces (Example: **8005551212**).

- Be sure to use a properly formatted **Email** address (Example: **yourname@gmail.com**).

3. When all desired information has been entered, tap **Save** to save your changes.

  - A confirmation message displays when customer information has bee successfully saved.

    - If an invalid **Phone** number or **Email** address has been entered, an advisory message displays. Tap **Close** to return to the Edit Customer Information fields. Make the necessary correction(s), then tap **Save** to save your changes.

Creating a RepairSolutions Report

Certain fields and pages require that you create a RepairSolutions report to access, download and display the associated "enhanced" data. A RepairSolutions "Tap for Details!" or "Create Report" message is shown where applicable.

*When shown, tap the **Tap for Details!** button to display the "Create Report!" message.*

1. If necessary. turn the tablet on (see Power Up and Power Off on page 3).

2. Verify the tablet is connected to a Wifi network (see SETTINGS on page 65).

3. If necessary, tap the **Tap for Details!** Button to display the "Create Report!" message.

4. Tap the **Create Report!** button on the "Create Report" message, or tap **Cancel** to exit without creating a report.

  - If this is the first time you are creating a report, "Terms of Use and Privacy Policy Confirmation" message displays.

  - Tap **Terms of Use** or **Privacy Policy** to view Innova's Terms of Use and Privacy Policy pages.

5. Tap the **Create Report!** button on the "Terms of Use and Privacy Policy Confirmation" message to continue.

*You MUST accept Innova's Terms of Use and Privacy Policy to continue. If you DO NOT accept Innova's Terms of Use and/or Privacy Policy, tap **Cancel** to exit without creating a report.*

6. A progress message shows while the report is updated. When the message closes, the screen refreshes to display all available "enhanced" data.

VEHICLE DIAGNOSTICS

1. Verify the tablet is properly connected to the vehicle and powered on (see CONNECTING THE TABLET on page 23).

2. Turn the ignition ON. **DO NOT** start the engine.

3. Tap **Vehicle Diagnostics**.

■ The Vehicle Diagnostics screen displays.
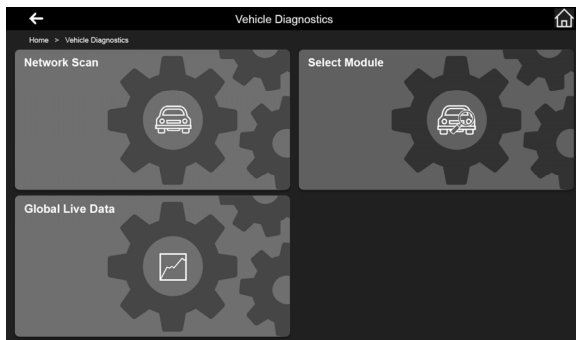
4. Refer to the appropriate paragraph for the diagnostic procedure you wish to perform:

■ **Network Scan** – see PERFORMING A NETWORK SCAN on page 37

■ **Select Module** – see SCANNING AND TESTING A SELECTED MODULE on page 38

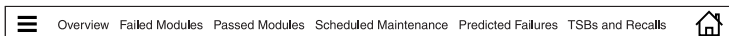■ **Global Live Data** – see GLOBAL LIVE DATA on page 43

PERFORMING A NETWORK SCAN

1. On the Vehicle Diagnostics screen (see VEHICLE DIAGNOSTICS on page 36), tap **Network Scan**.

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

■ If the Scan Tool fails to link to the vehicle's computer, a "Scan Failed" message shows.

- Ensure the vehicle is OBD2 compliant.

- Verify the connection at the DLC, and verify the ignition is ON.

- Turn the ignition OFF, wait 5 seconds, then back ON to reset the computer.

- Tap **Try Again** to try again, or, tap **Cancel** to return to the Home Page.

2. A progress dialog displays while the tablet retrieves any Diagnostic Trouble Codes, Monitor Status and Freeze Frame Data from the vehicle's computer memory.

3. When the retrieval process is complete, the **Mileage** dialog displays.

■ Enter the mileage shown on the vehicle's odometer using the keyboard (see USING THE KEYBOARD on page 4), or, tap **Pull From Vehicle** to retrieve the current mileage from the odometer, then tap **Submit**.

4. The screen displays the results of the scan (see Viewing Network Scan Results on page 38).

Viewing Network Scan Results

The **Network Scan** results screen is similar in content to the **Custom Scan** screen. It includes the **Overview**, **Failed Modules**, **Passed Modules**, **Scheduled Maintenance**, **Predicted Failures** and **TSBs and Recalls** pages (see VIEWING SCAN RESULTS on page 25).

| ☰ | Overview Failed Modules Passed Modules Scheduled Maintenance Predicted Failures TSBs and Recalls | ⌂ |

Certain fields and pages require that you create a RepairSolutions report to access, download and display the associated data. A RepairSolutions "Create Report" message is shown where applicable (see Creating a RepairSolutions Report on page 36).
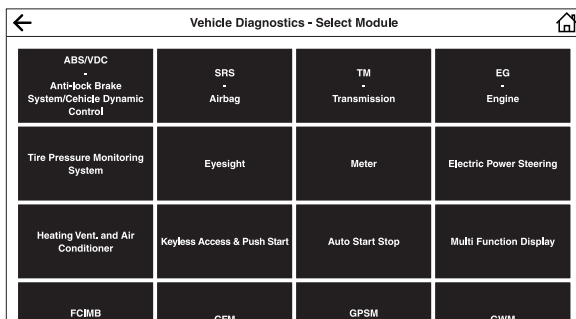
SCANNING AND TESTING A SELECTED MODULE

The **Select Module** function lets you perform diagnostics for a single, selected vehicle module. Depending on the module selected, you can **Read DTCs**, **Erase DTCs**, view **Live Data**, and perform **Actuator Test** and/or **Special Test** procedures.

1. On the Vehicle Diagnostics screen (see VEHICLE DIAGNOSTICS on page 36), tap **Select Module**.

■ The tablet displays a menu of available module for the vehicle under test.

> *The list of available modules is vehicle-specific and will vary between vehicles.*

| ←	**Vehicle Diagnostics - Select Module**	⌂
ABS/VDC - **Anti-lock Brake System/Vehicle Dynamic Control**	**SRS** - **Airbag**	**TM** - **Transmission**	**EG** - **Engine**
Tire Pressure Monitoring System	**Eyesight**	**Meter**	**Electric Power Steering**
Heating Vent. and Air Conditioner	**Keyless Access & Push Start**	**Auto Start Stop**	**Multi Function Display**
FCIMB	**GFM**	**GPSM**	**GWM**

2. Tap the name of the module for which you wish to perform diagnostics.

■ The "Actions" menu for the selected module displays.

Actions that are not available for the selected module are "grayed" out.
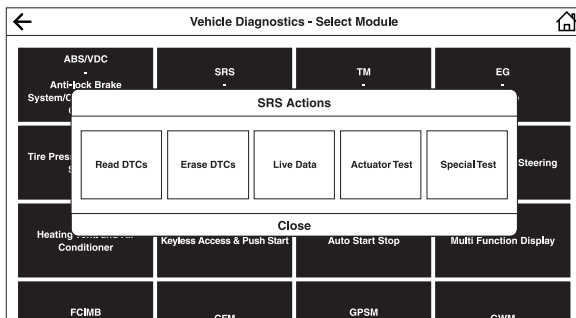
3. Refer to the appropriate paragraph for the diagnostic procedure you wish to perform:

- **Read DTCs** – see Reading DTCs for a Selected Module on page 39

- **Erase DTCs**- see Erasing DTCs for a Selected Module on page 40

- **Live Data** – see Viewing Live Data for a Selected Module on page 40

- **Actuator Test** – See Performing Actuator Tests for a Selected Module on page 41

- **Special Test** – see Performing Special Tests for a Selected Module on page 42

Reading DTCs for a Selected Module

1. Select the module for which you wish to read DTCs (see SCANNING AND TESTING A SELECTED MODULE on page 38).

2. Tap **Read DTCs** in the "Actions" menu.

- The tablet retrieves and displays DTCs stored in the vehicle's computer for the currently selected module.
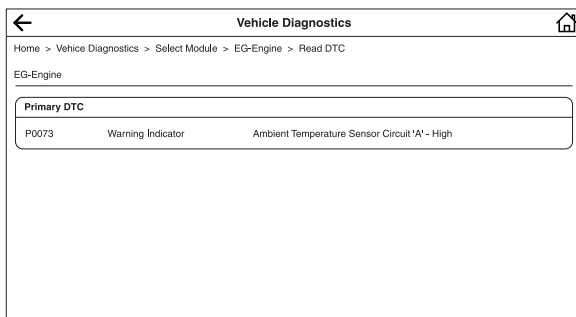
■ Each entry shows the DTC number, type, and definition.

> *If no DTCs for the selected module are currently stored in the vehicle's computer, the message "Fail" displays.*

3. Tap an entry in the "breadcrumbs" trail at the top of the screen to return to a previous screen.
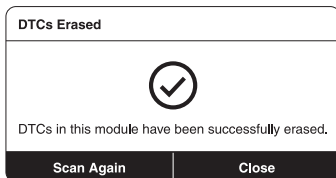
Erasing DTCs for a Selected Module

1. Select the module for which you wish to read DTCs (see SCANNING AND TESTING A SELECTED MODULE on page 38).

2. Tap **Erase DTCs** in the "Actions" menu. A confirmation message shows.

   Delete All DTCs

   DTCs in this module will be permanently erased.
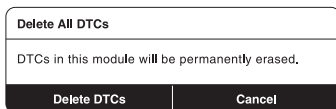
   Delete DTCs   Cancel

   ■ If you are sure you want to proceed, tap **Delete DTCs** to continue.

   ■ If you do not want to proceed, tap **Cancel** to cancel the erase procedure.

3. If you chose to erase DTCs, an "Erasing DTCs…" message displays while the erase function is in progress.

   ■ If the erase was successful, a confirmation message shows. Tap **Scan Again** to re-scan the currently selected module, or, tap **Close** to close the confirmation message and return to the "Actions" menu.

   DTCs Erased

   DTCs in this module have been successfully erased.

   Scan Again   **Close**

   ■ If the erase was not successful, an advisory message shows. Make sure the tablet is properly connected to the vehicle's DLC, then tap **Try Again** to repeat the erase procedures. (Tap **Cancel** to cancel the erase procedures and close the message.)

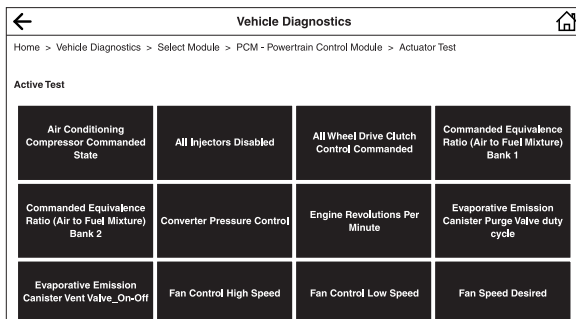## Viewing Live Data for a Selected Module

You can view Live Data for the currently selected module.

1. While linked to the vehicle, start the engine.

2. Select the module for which you wish to view Live Data (see SCANNING AND TESTING A SELECTED MODULE on page 38).

3. Tap **Live Data** in the "Actions" menu to place the tablet in Live Data mode (see LIVE DATA MODE on page 43).

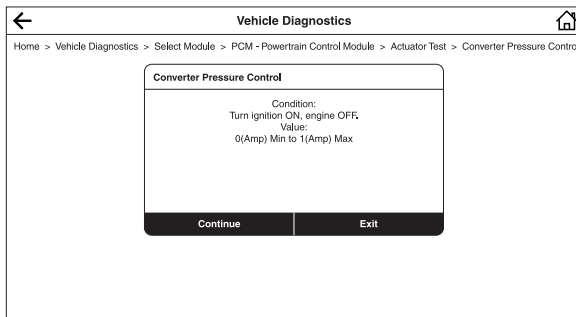**Performing Actuator Tests for a Selected Module**

Actuator Tests let you perform active tests for various vehicle actuators and systems. The specific tests available depend on the vehicle make and model.

1. Select the module for which you wish to perform actuator tests (see SCANNING AND TESTING A SELECTED MODULE on page 38).

2. Tap **Actuator Test** in the "Actions" menu.

   ■ The tablet retrieves and displays a menu of actuator tests available for the vehicle under test.

←   **Vehicle Diagnostics**   ⌂

Home > Vehicle Diagnostics > Select Module > PCM - Powertrain Control Module > Actuator Test

Active Test

| Air Conditioning Compressor Commanded State | All Injectors Disabled | All Wheel Drive Clutch Control Commanded | Commanded Equivalence Ratio (Air to Fuel Mixture) Bank 1 |
| Commanded Equivalence Ratio (Air to Fuel Mixture) Bank 2 | Converter Pressure Control | Engine Revolutions Per Minute | Evaporative Emission Canister Purge Valve duty cycle |
| Evaporative Emission Canister Vent Valve_On-Off | Fan Control High Speed | Fan Control Low Speed | Fan Speed Desired |

☞ *If Actuator Tests are not supported for the vehicle under test, the message "Actuator Test is not supported for this vehicle" displays. Tap **Exit** to return to the "Actions" menu.*

3. Choose the desired test.

   ■ The tablet may display one or more instructional screen to prepare the vehicle for testing.

←   **Vehicle Diagnostics**   ⌂

Home > Vehicle Diagnostics > Select Module > PCM - Powertrain Control Module > Actuator Test > Converter Pressure Control

Converter Pressure Control

Condition:
Turn ignition ON, engine OFF.
Value:
0(Amp) Min to 1(Amp) Max

Continue   Exit

---

4. Prepare the vehicle for testing, as necessary.

   ■ The tablet displays a "control" screen for operating the actuator.
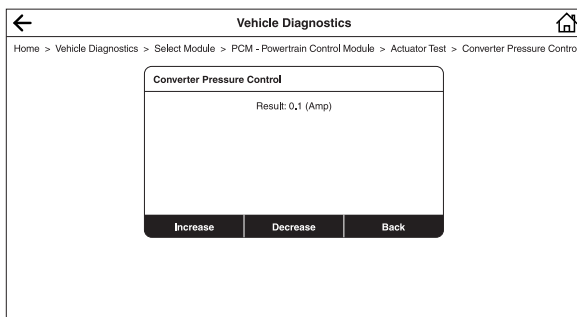
5. Tap the appropriate control to operate the actuator as desired.

- The screen refreshes to show the result.

6. Repeat step **5** as desired.

7. Tap **Back** to return to the Actuator Test menu.

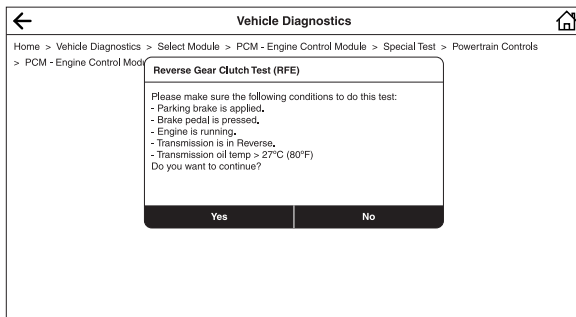## Performing Special Tests for a Selected Module

Special Tests let you perform diagnostic and calibration procedures for various vehicle actuators and systems. The specific tests available depend on the vehicle make and model.

1. Select the module for which you wish to perform special tests (see SCANNING AND TESTING A SELECTED MODULE on page 38).

2. Tap **Special Test** in the "Actions" menu.

- The tablet retrieves and displays one or more menus of special tests available for the vehicle under test.
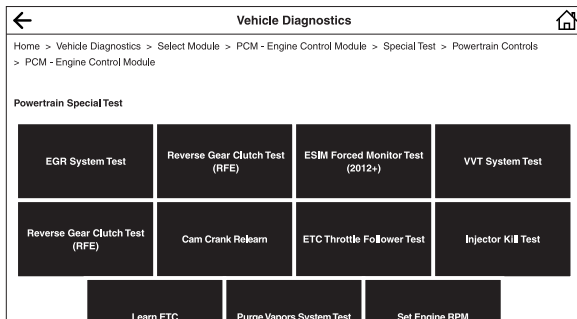
> *If Special Tests are not supported for the vehicle under test, the message "Special Test is not supported for this vehicle" displays. Tap **Exit** to return to the "Actions" menu.*

3. Make the necessary selections to choose the desired test.

- A series of instructional screens display.

```
┌─────────────────────────────────────────────────────────┐
│  ←                    Vehicle Diagnostics             ⌂   │
│                                                           │
│  Home  >  Vehicle Diagnostics  >  Select Module  >  PCM - Engine Control Module  >  Special Test  >  Powertrain Controls │
│  >  PCM - Engine Control Mod┌─────────────────────────────┐ │
│                            │ Reverse Gear Clutch Test (RFE) │ │
│                            │                               │ │
│                            │ Please make sure the following conditions to do this test: │ │
│                            │ - Parking brake is applied.   │ │
│                            │ - Brake pedal is pressed.     │ │
│                            │ - Engine is running.          │ │
│                            │ - Transmission is in Reverse. │ │
│                            │ - Transmission oil temp > 27ºC (80ºF) │ │
│                            │ Do you want to continue?      │ │
│                            │                               │ │
│                            │      Yes            No         │ │
│                            └─────────────────────────────┘ │
│                                                           │
└─────────────────────────────────────────────────────────┘
```

4. Follow the on-screen prompts to prepare the vehicle for testing, and to perform the selected test procedure.

- A "results" screen displays when the test procedure has completed.

5. Tap **Finish** or **Exit** to return to the previous menu.

6. Tap an entry in the "breadcrumbs" trail at the top of the screen to return to a previous screen.

GLOBAL LIVE DATA

You can view Global Live Data for the vehicle currently under test.

- While linked to the vehicle, start the engine.

- On the Vehicle Diagnostics screen (see VEHICLE DIAGNOSTICS on page 36), tap **Global Live Data** to place the tablet in Live Data mode (see LIVE DATA MODE on page 43).

LIVE DATA MODE

The tablet lets you view and/or 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.

The real time (Live Data) vehicle operating information (values/status) that the computer supplies to the tablet 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 tablet 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 tablet data. Trying to drive and operate the tablet at the same time is dangerous, and could cause a serious traffic accident.*

1. Place the tablet in Live Data mode using the desired procedure (see Viewing Live Data for a Selected Module on page 40, GLOBAL LIVE DATA on page 43, or VIEWING LIVE DATA on page 62, as appropriate.

    ■ A progress dialog displays while the vehicle is scanned and Live Data mode is activated.

    *If you do not wish to view a graphical representation of Live Data, tap **Cancel View Graph** on the progress dialog to view Live Data in tabular format only. Proceed to step 3.*

2. The tablet displays a graphical presentation of Live Data.
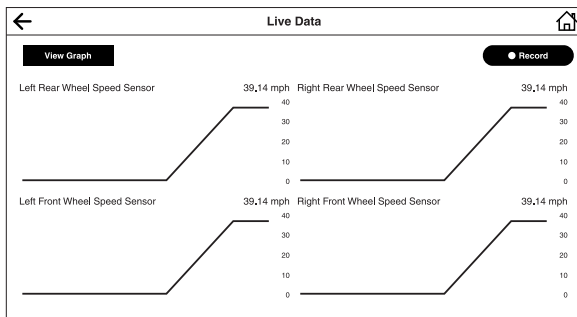
    ■ Each entry in the graph shows the name of the PID, and a graphical representation of the current value for the PID.

3. Tap **View Table** to view a tabular presentation of Live Data.

    ■ Each entry in the table shows the name of the PID, and a numerical representation of the current value for the PID.

    *Use the **View Table** and **View Graph** buttons to toggle the display between graph mode and tabular mode.*

4. If you experience vehicle problems, view and/or compare the Live Data (PID) information displayed on the tablet 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 on page 45 for

details. You may also choose to record Live Data for later viewing. See Recording (Capturing) Live Data on page 45 for details.

Customizing Live Data

You can customize the Live Data display by selecting only the PIDs that you wish to display.

1. Place the tablet in Live Data mode using the desired procedure (see Viewing Live Data for a Selected Module on page 40, GLOBAL LIVE DATA on page 43, or VIEWING LIVE DATA on page 62, as appropriate.

2. If necessary, tap **View Table** to view the tabular presentation of Live Data.

3. Tap the checkboxes associated with each PID to select or unselect individual PIDs. Tap **Unselect Parameters** to unselect *all* PIDs.

   ■ A "checkmark" indicates the associated PID *is* selected for display.

   ■ An "empty checkbox" indicates the PID *is not* selected for display.

   ■ Tapping a checkbox repeatedly will toggle it on and off.

4. The tablet refreshes to display values and graphical data for selected PIDs only.

Recording (Capturing) Live Data

You can record and save Live Data information for each PID supported by the vehicle in the tablet's memory.

1. Place the tablet in Live Data mode using the desired procedure (see Viewing Live Data for a Selected Module on page 40, GLOBAL LIVE DATA on page 43, or VIEWING LIVE DATA on page 62, as appropriate.

2. Tap **Record** to begin recording Live Data. Tap **Stop** to stop recording.

3. A "Recording Complete" dialog displays the message "Would you like to save the recorded live data?"

> Recording Complete
>
> Would you like to save the recorded live data?
>
> Yes, Save Live Data | No, Erase Live Data

■ Tap **Yes, Save Live Data** to save the recorded data to the tablet's memory for subsequent playback (see The Live Data Tab on page 63).

■ Tap **No, Erase Live Data** to discard the recorded data.
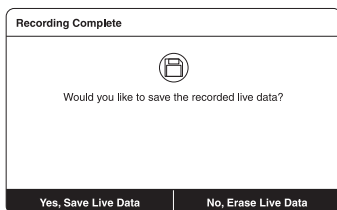
ERASING DIAGNOSTIC TROUBLE CODES (DTCs)

Erase DTCs from the computer's memory as follows:

☞ ***When the tables Erase function is used to erase DTCs from the vehicle's on-board computer, "Freeze Frame" data and manufacturer-specific-enhanced data are also erased. "Permanent" DTCs ARE NOT erased by the Erase function.***
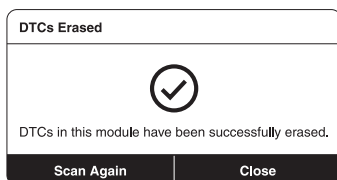
☞ *When DTCs are erased, the I/M Readiness Monitor Status program resets the status of all Monitors to a not run condition. To set all Monitors to a DONE status, an OBD2 Drive Cycle must be performed.*

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

2. Perform a scan of the vehicle as described on page 23.

3. Select **Erase DTCs** from the Main Menu (see THE MAIN MENU on page).

> Select DTCs to Erase
>
> Select the DTCs you would like to erase.
> ☐ Powertrain
> ☐ ABS
> ☐ SRS
>
> Erase DTCs | Cancel

■ The tablet displays the Select DTCs to Erase dialog.

4. Tap the checkbox(es) for the types of DTCs you wish to erase, then tap **Erase DTCs**. A confirmation dialog displays the message "All DTCs will permanently erased."

> Delete All DTCs
>
> DTCs in this module will be permanently erased.
>
> Delete DTCs | Cancel

■ If you are sure you want to proceed, tap **Erase DTCs** to continue.

■ If you do not want to proceed, choose **Back** to cancel the erase procedure.
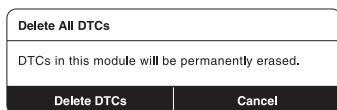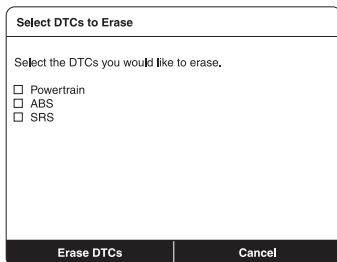
5. If you chose to erase DTCs, a "One moment please…" message displays while the erase function is in progress.

- If the erase was successful, a confirmation message shows.

- If the erase was not successful, an advisory message shows indicating the erase request was sent to the vehicle's computer.

```
DTCs Erased

         ✓

DTCs in this module have been successfully erased.

  Scan Again          |          Close
```

OBD MODE TESTS

OBD mode tests are accessed from the **Global OBD**, **Overview** or **Failed Modules** page of the scan results screen (see VIEWING SCAN RESULTS on page 25).. The following functions are available:
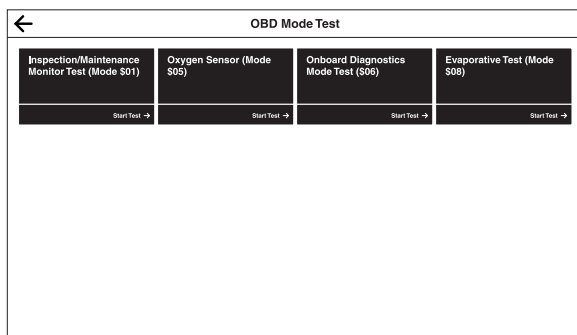
←	OBD Mode Test		
Inspection/Maintenance Monitor Test (Mode $01)	Oxygen Sensor (Mode $05)	Onboard Diagnostics Mode Test ($06)	Evaporative Test (Mode $08)
Start Test →	Start Test →	Start Test →	Start Test →

- **Inspection/Maintenance Monitor Test ($01)** – Lets you view the Drive Cycle Procedures for all monitors supports by the vehicle.

- **Oxygen Sensor (Mode $05)** – Retrieves and displays O2 sensor monitor test results from your vehicle's on-board computer.

- **Onboard Diagnostics Mode Test (Mode $06)** – Retrieves test results for emission-related powertrain components and systems that are not continuously monitored.

- **Evaporative Test (Mode $09)** – Performs a leak test for the vehicle's EVAP system.

> *In cases where a function is not supported by the vehicle under test, the unsupported function is "grayed out," and cannot be selected.*

Inspection/Maintenance Monitor Test ($01)

The **Inspection/Maintenance Monitor Test ($01)** lets you view the Drive Cycle Procedures for all monitors supports by the vehicle. A Drive 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 tablet to view the Drive Cycle procedures for a selected Monitor.

1. From the **OBD Mode Test** screen, tap **Inspection/Maintenance Monitor Test ($01)**.

   - The Drive Cycle Procedures page displays.

   - The left column of the page lists the **Drive Cycle Monitors** (the monitors supported by the vehicle), and shows the status of each monitor (**Complete** or **Incomplete**) at the time the scan was run.

Drive Cycle Procedures

Drive Cycle Monitors

Misfire Monitor	Complete ●
Fuel System Monitor	Complete ●
Comprehensive Component Mo...	Complete ●
EGR System Monitor	Incomplete ●
Catalyst Monitor	Incomplete ●
EVAP System Monitor	Incomplete ●
Oxygen Sensor Monitor	Incomplete ●
Oxygen Sensor Heater Monitor	Incomplete ●

Misfire Monitor Information

Urban (City) Drive Cycle

Misfire Monitor Notes

1. This driving procedure is designed to simulate city driving.
2. When instructed, vary speed smoothly.
3. Also perform the All Monitors - Urban (City) highway Drive Cycle twice.

Misfire Monitor Pre-Condition

N/A

Misfire Monitor Procedure

- The right column of the page shows the Drive Cycle procedure for the currently selected monitor.

2. Tap a monitor name to view the Drive Cycle procedure for the selected monitor.

   - The page refreshes to display the Drive Cycle procedure for the selected monitor.

Oxygen Sensor (Mode $05)

THIS FUNCTION IS NOT CURRENTLY OPERATIONAL

Onboard Diagnostics Mode Test (Mode $06)

The **Onboard Diagnostics Mode Test (Mode $06)** 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 tablet does not perform the OBD mode test, but retrieves results from the most recently performed tests from the on-board computer's memory.

1. From the **OBD Mode Test** screen, tap **Onboard Diagnostics Mode Test (Mode $06)**.

2. When test results have been retrieved, the test results screen displays. The following information is provided for each available test:

OBD Mode Test

Exhaust Gas Sensor Monitor Bank 1 - Sensor 2 ($02)   X

Component ID	Value	Min	Max	Unit	Status
Rich to lean sensor switch time ($05)	2.052	0.000	4.080	s	OK
Rich to lean sensor threshold voltage ($01)	0.365024	0.000000	0.365024	V	OK
Component ID: $30	53.72	-40.00	102.46	Angle	OK

Catalyst Monitor Bank 1 ($21)   X

Component ID	Value	Min	Max	Unit	Status
Component ID: $40	2.44140005	0.00000000	12.27804470	lambda	OK

VVT Monitor Bank 1 ($35)   X

- **Test ID** number

- **Component ID** number(s)

- Test **Value**

- **Min** or **Max** test limit

  👉 *Only one test limit, either **Min** or **Max**, is shown for any given test.*

- **Unit** of measurement

- **Status**

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

3. Tap an **X** icon to close the test results screen and return to the **OBD Mode Test** screen.

Evaporative Test (Mode $09)

The **Evaporative Test (Mode $09)** function lets you initiate a leak test for the vehicle's EVAP system.

👉 *The tablet 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 **Evaporative Test** function, refer to the vehicle's service manual to determine the procedures necessary to stop the test.*

1. From the **OBD Mode Test** screen, tap **Evaporative Test (Mode $09)**.

2. When the EVAP leak test has been initiated, a confirmation screen shows the message "**OK**." Tap the **X** icon to close the message and return to the **OBD Mode Test** screen.

←	OBD Mode Test	
$08		X
OK		
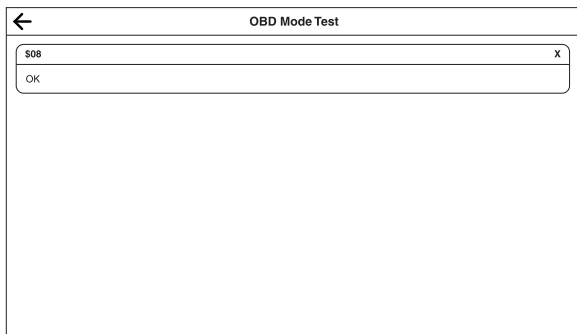
👉 *If the Evaporative Test (Mode $09) is not supported by the vehicle, an advisory screen shows the message "**Not support**."*

VIEWING IN-USE PERFORMANCE TRACKING (IPT)

The tablet 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. Tap the **View IPT** button in the Vehicle Information and Customer Information field of the scan results screen (see VIEWING SCAN RESULTS on page 25).

2. When the retrieval process is complete, In-use Performance Tracking statistics are shown. Swipe up or down, as necessary, to view the entire list.

In-Performance Tracking	
OBDCOND	0
IGNCNTR	0
CATCOMP1	1115
CATCOND1	2061
CATCOMP2	0
CATCOND2	0
02SCOMP1	1741
02SCOND1	2061
02SCOMP2	0
Close	

3. When you have finished viewing the statistics, tap **Close** to close the list and return to the Vehicle information and Customer Information field.

PERFORMING SERVICE RESETS

The **Service Reset** screen offers up to seven options for performing service reset procedures; **Oil Light Reset**, **Battery Reset**, **Electric Parking Brakes**, **Steering Angle Reset**, **ABS Bleeding** and **Battery/Alternator Test**.

To access Service Reset functions:

■ From the Home Page (see THE HOME PAGE on page 4), tap **Service Reset**.

- The Service Reset screen displays.

←	Service Reset	⌂

Home > Service Reset

Select a system.

Oil Light Reset	Battery Reset	Electric Parking Brakes	Steering Angle Reset
	ABS Bleeding	Battery / Alternator Test	
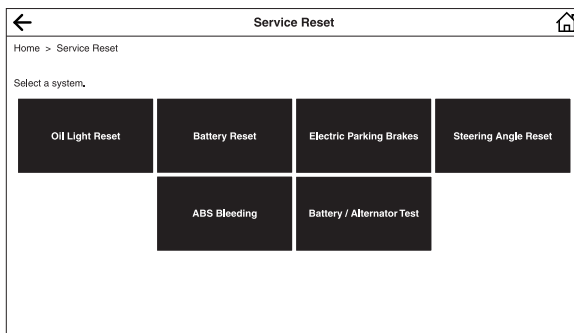
■ Tap an option on the Service Reset screen to initiate the associated procedure or process.

- Tap an entry in the "breadcrumbs" trail at the top of the screen to return to a previous screen.

> *When performing Service Reset procedures, a "One moment please" message may display between screens.*

Resetting the Oil Maintenance Light

> *If Oil Light Reset procedures are not available for the vehicle under test, the message "There are no oil reset procedures available for this vehicle" displays. Tap **Exit** to return to the Service Reset screen.*

1. Tap **Oil Light Reset** on the Service Reset screen.

■ An "instructional" dialog displays.

2. Select the desired option to continue.

■ A "One moment" message displays while the procedure is in process.

Oil Reset
Reset oil maintenance?

Yes	No

3. When the reset process has competed, a confirmation message displays. Tap **Exit** to return to the Service Reset screen.

■ If the oil reset was not successful, an advisory message displays.

■ To perform the oil reset by procedure, tap **View Procedure**. 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, choose **Exit** to return to the Service Reset screen.
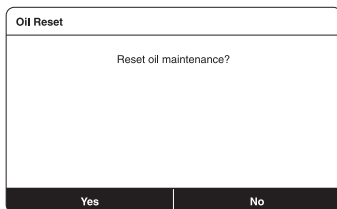
> *If the Scan Tool cannot reset the Oil Maintenance Light, an "instructional" dialog displays, showing the manual procedures for resetting the indicator light. When finished viewing the instructions, tap **Back** to return to the Service Reset screen.*

Battery Reset

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

To view battery reset procedures:

1. Tap **Battery Reset** on the Service Reset screen.

■ The Battery Reset menu displays.
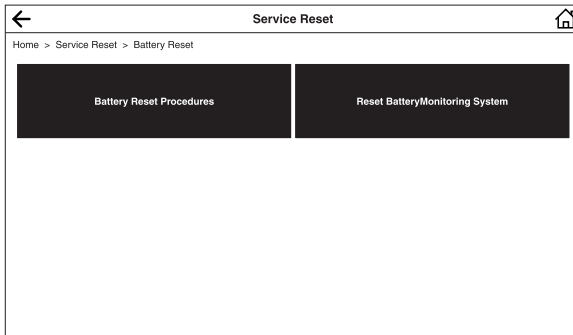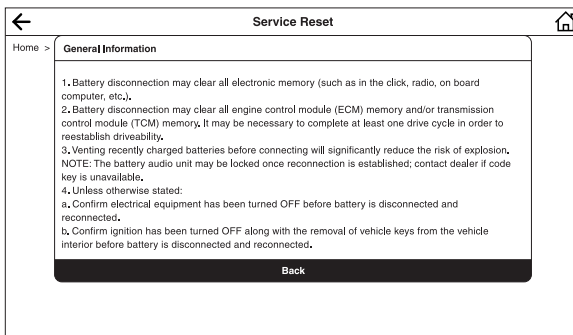

2. Tap **Battery Reset Procedures**.

■ 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, an advisory message shows. Tap **Exit** to return to the Service Reset screen.*

3. Tap the procedure you wish to view.

■ The selected procedure displays.

4. When you have finished viewing the retrieved information, tap **Back** to return to the Battery Reset Procedures menu. Repeat step **3** to view additional procedures.

■ When you have finished viewing all desired procedures, tap **Service Reset** in the "breadcrumbs" trail to return to the Service Reset screen.

To perform battery reset OBD service:

1. Tap **Battery Reset** on the Service Reset screen.

■ The Battery Reset menu displays.
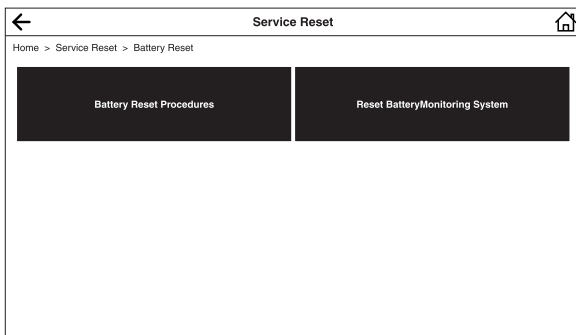
2. Tap **Reset Battery Monitoring System**.

■ An "instructional" message displays.
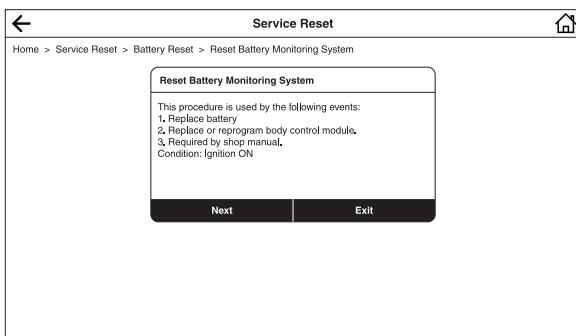
3. Follow the instructions provided to prepare the vehicle for battery reset OBD service. When all necessary procedures have been performed, tap **Next** to continue.

■ A "One moment please…" message displays while battery reset is in process.

4. If the battery reset process is successful, a "Reset Complete" message displays. Tap **Exit** to return to the Service Reset screen.

■ If the battery reset process is not successful, a "Reset Fail" message displays. Tap **Exit** to return to the Service Reset screen.

Electric Parking Brake Reset

Electric Parking Brake reset procedures vary between vehicle makes and models.

*If an error occurs while performing calibration procedures, an "advisory" message displays. Tap **Exit** to return to the Service Reset screen.*

1. Tap **Electric Parking Brakes** on the Service Reset screen.

- For some vehicles, one or more submenus display. Tap the desired module and/or option, as appropriate. Proceed to step 2.

```
←                        Service Reset                        ⌂

Home  >  Service Reset  >  Electric Parking Brakes

        EPB - Electric Parking Brake
```
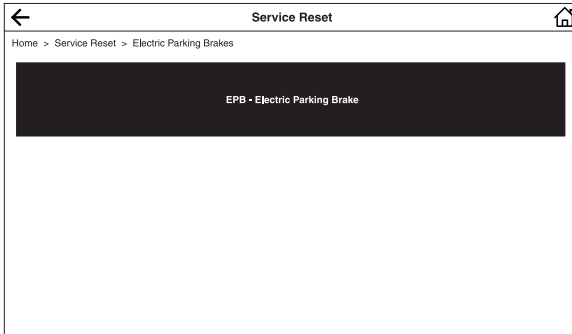
☞ *If Electric Parking Brake reset is not supported by the vehicle under test, an "advisory" message displays. Tap **OK** to return to the Service Reset screen.*

2. A "One moment" message displays, followed by one or more "informational/ instructional" screens.

```
PAD Change Mode - Apply

Before changing brake pad, this function should be performed. This will allow you to push the piston
into caliper by retacting spindle nut with actuator.
While PAD change mode is in progress, text message is displayed at cluster.
After changing brake pad, Apply/Release function should be executed 3 times.
[Set Condition]
- Engine OFF
- IG ON


            Continue                    Exit
```
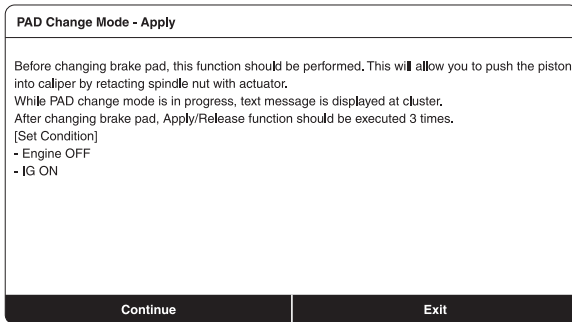
- Perform test procedures as directed. Tap **Continue**, as appropriate, to scroll to the next screen.

3. For some vehicles, "status" screens display as each phase of the calibration procedure is successfully completed. Tap **OK**, as appropriate, to scroll to the next screen.

```
PAD Change Mode - Apply

            ✓

      It's been completed!


            OK
```

- A "One moment" message displays while the procedure is in process.

- A "results" screen displays when the calibration procedure has completed.
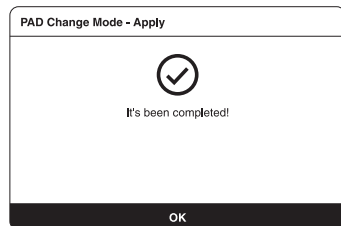
> ☞ *If the procedure is stopped due to a communication error, an "advisory" message displays. Tap **Exit** to return to the Service Reset screen.*

4. Tap **OK** to return to the Service Reset screen.

Steering Angle Reset

The **Steering Angle Reset** function is available for BMW, Chrysler, Ford, GM, Hyundai, Nissan, Toyota, Volkswagen and Volvo vehicles only. Calibration procedures vary between vehicle makes and models.
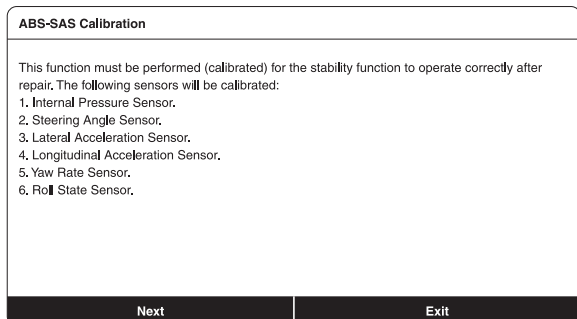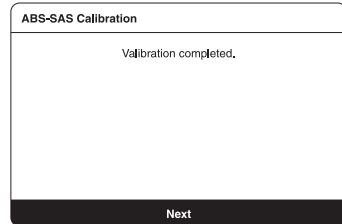
> ☞ *If an error occurs while performing calibration procedures, an "advisory" message displays. Tap **Exit** to return to the Service Reset menu.*

1. Select **Steering Angle Reset** on the Service Reset screen.

- For some vehicles, one or more submenus display. Tap the desired module and/or option, as appropriate. Proceed to step 2.

```
←                    Service Reset                    ⌂

Home  >  Service Reset  >  Steering Angle Reset

┌─────────────────────────────────────────────────┐
│                                                   │
│           Steering Angle Sensor Calibration       │
│                                                   │
└─────────────────────────────────────────────────┘
```
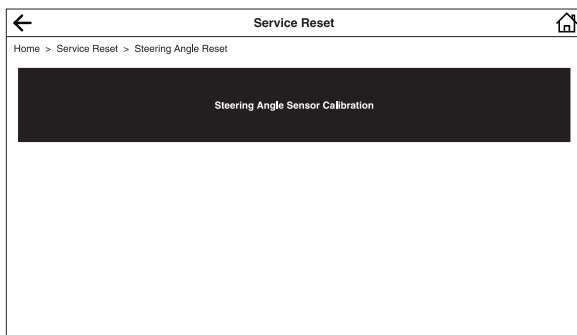
> ☞ *If SAS calibration is not supported by the vehicle under test, an "advisory" message displays. Tap **OK** to return to the Service Reset menu.*

2. A "One moment" message displays, followed by one or more "informational/ instructional" screens.

```
ABS-SAS Calibration

This function must be performed (calibrated) for the stability function to operate correctly after
repair. The following sensors will be calibrated:
1. Internal Pressure Sensor.
2. Steering Angle Sensor.
3. Lateral Acceleration Sensor.
4. Longitudinal Acceleration Sensor.
5. Yaw Rate Sensor.
6. Roll State Sensor.

        Next                              Exit
```

■ Perform test procedures as directed. Tap **Next**, as appropriate, to scroll to the next screen.

3. For some vehicles, "status" screens display as each phase of the calibration procedure is successfully completed. Tap **Next**, as appropriate, to scroll to the next screen.

■ A "results" screen displays when the calibration procedure has completed.

4. Tap **Next** or **End** to return to the Steering Angle Reset menu.

5. Tap **Service Reset** in the "breadcrumbs" trail to return to the Service Reset screen.

> **ABS-SAS Calibration**
>
> Valibration completed.
>
> **Next**

ABS Bleeding

The **ABS Bleeding** function is available for Chrysler, GM, Hyundai/Kia, Mazda and Toyota vehicles only. Procedures vary between vehicle makes and models.

> *If an error occurs while performing ABS bleeding procedures, an "advisory" message displays. Tap **Exit** or **Back**, as necessary, to return to the Service Reset menu.*

> *If ABS bleeding is not supported for the vehicle under test, an "advisory" message displays. Tap **OK**, as necessary, to return to the Service Reset menu.*

1. Tap **ABS Bleeding** on the Service Reset screen.

■ One or more submenus will display. Select the desired options, then proceed to step 2.

2. One or more "informational/ instructional" screens display.

■ Perform test procedures as directed. Tap **OK** or **Continue** to scroll to the next screen.

> **ABS Bleeding**
>
> - Connect the brake charger/bleeder unit to the brake fluid reservoir
> - Ignition switch ON
> - Brake charger/bleeder switch OFF
>
> **Continue**   **End**

3. For some vehicles, "status" screens display as each phase of the calibration procedure is successfully completed. Tap **OK** or **Start** to scroll to the next screen.

■ A "results" message displays when the procedure has completed.

> **ABS Bleeding**
>
> The basic setting was successful. - Ignition switch ON
> - Brake charger/bleeder switch OFF.
> - Close the rear left bleeder screws.
> - Turn ignition off few seconds then turn on again.
>
> **End**

4. Tap **OK** or **End** to close the results message.
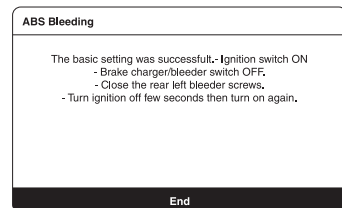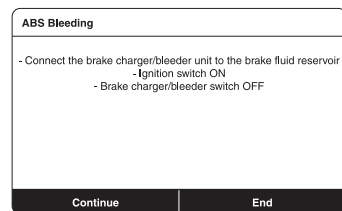
5. Tap **Service Reset** in the "breadcrumbs" trail to return to the Service Reset screen.

Battery / Alternator Test

The tablet 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. Tap **Battery / Alternator Test** on the Service Reset screen.

■ The Battery / Alternator Test menu displays.

←	Service Reset	⌂

Home > Service Reset > Battery / Alternator Test

Battery Test	Alternator Test
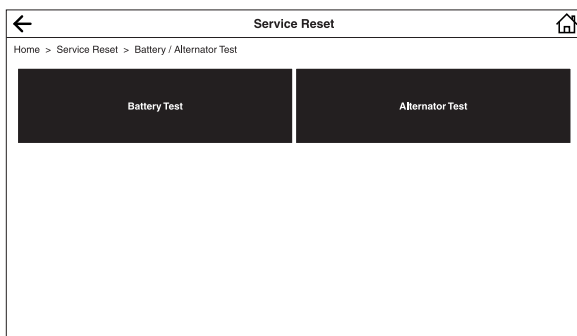
2. Tap **Battery Test**.

■ An "instructional" message displays, showing the procedures to prepare the vehicle for the battery check.

3. 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.

4. Tap **Continue** to proceed.

*If the engine is running, an advisory message shows. Turn the engine off, then turn the ignition on. **DO NOT** start the engine. Tap **Continue** to proceed.*

■ An "instructional" message displays.

5. Turn the vehicle's headlights on, then tap **Continue** to proceed.

- A "countdown" message shows while the battery check is in process.

- If battery voltage is *less than* 12.1 volts, an advisory message shows. Tap **Home** to return to the Home Page. Turn the ignition off and disconnect the tablet 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.

6. Turn the vehicle's headlights off, then tap **Continue** to proceed.

- An "instructional" message shows.

7. Start the vehicle's engine. Allow the engine to run for several seconds, then turn the engine off.

> *If the tablet did not detect "cranking status" for the vehicle's engine, an advisory message shows. Tap **Retest** to repeat the battery check, or, choose **Exit** to return to the Home Page.*

8. When the battery check is complete, a results screen displays the battery status.

9. Tap **Exit** to return to the Battery / Alternator Test menu.

10. Tap **Service Reset** in the "breadcrumbs" trail to return to the Service Reset screen.

```
┌─────────────────────────────────────┐
│ Battery Test                         │
│                                      │
│          Battery Status: Good        │
│                                      │
│                                      │
│                                      │
│                                      │
│                 Exit                 │
└─────────────────────────────────────┘
```
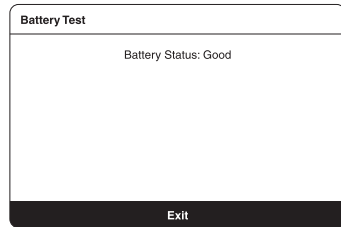
To perform a charging system check:

1. Tap **Battery / Alternator Test** on the Service Reset screen.

- The Battery / Alternator Test menu displays.

```
┌────────────────────────────────────────────┐
│ ←              Service Reset             ⌂  │
│ Home  >  Service Reset  >  Battery / Alternator Test │
│  ┌──────────────────┐  ┌──────────────────┐ │
│  │   Battery Test   │  │  Alternator Test │ │
│  └──────────────────┘  └──────────────────┘ │
│                                              │
│                                              │
│                                              │
│                                              │
└────────────────────────────────────────────┘
```
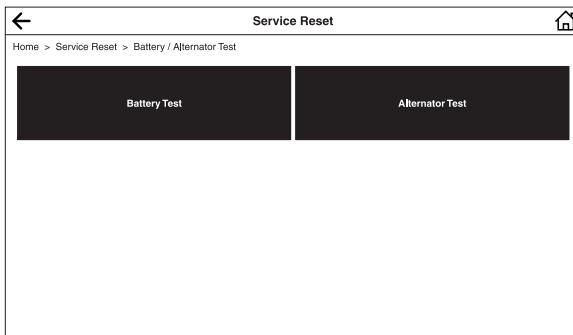
2. Tap **Alternator Monitor**.

- An "instructional" message shows.

3. Start and warm the engine to normal operating temperature. Turn on the headlights. Tap **Continue** to proceed.

- An "instructional" message shows.

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

- When engine speed is within the required range, the alternator test begins. A progress screen shows.

- When the "countdown" timer expires, an "instructional" message shows.

5. 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.

6. 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.

7. Tap **Exit** to return to the Battery / Alternator Test menu.

8. Tap **Service Reset** in the "breadcrumbs" trail to return to the Service Reset screen.

```
Alternator Test

        Voltage PID: 13.96V

    Charging voltage within specification



              Exit
```
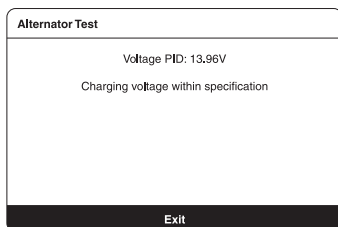
VIEWING DRIVE CYCLE PROCEDURES

A Drive 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 tablet to view the Drive Cycle procedures for a selected Monitor.

1. From the **Monitor Status** field on the **Global OBD** page (see Global OBD on page 26) or **Failed Modules** page (see Failed Modules on page 30), tap the **View Drive Cycles** button.

- The Drive Cycle Procedures page displays.

```
←                    Drive Cycle Procedures

Drive Cycle Monitors                    Misfire Monitor Information

 Misfire Monitor           Complete  ●    Urban (City) Drive Cycle

 Fuel System Monitor       Complete  ●   Misfire Monitor Notes

 Comprehensive Component Mo... Complete  ●   1. This driving procedure is designed to simulate city driving.
                                             2. When instructed, vary speed smoothly.
 EGR System Monitor        Incomplete ●   3. Also perform the All Monitors - Urban (City) highway Drive
                                             Cycle twice.
 Catalyst Monitor          Incomplete ●

 EVAP System Monitor       Incomplete ●   Misfire Monitor Pre-Condition

 Oxygen Sensor Monitor     Incomplete ●    N/A

 Oxygen Sensor Heater Monitor  Incomplete ●  Misfire Monitor Procedure
```

- The left column of the page lists the **Drive Cycle Monitors** (the monitors supported by the vehicle), and shows the status of each monitor (**Complete** or **Incomplete**) at the time the scan was run.

- The right column of the page shows the Drive Cycle procedure for the currently selected monitor.

2. Tap a monitor name to view the Drive Cycle procedure for the selected monitor.

- The page refreshes to display the Drive Cycle procedure for the selected monitor.

THE MAIN MENU

Tap the ≡ icon in the upper left corner of the display screen to open the Main Menu. The Main Menu provides access to the following features and functions:

Home: Returns to the Home Page from the currently active display screen (see THE HOME PAGE on page 4).

Erase DTCs: Erases OBD2 DTCs, Freeze Frame data, and manufacturer-specific DTCs from the vehicle's computer, and resets all monitors to "Incomplete" status (see ERASING DIAGNOSTIC TROUBLE CODES (DTCs) on page 42).

Live Data: Lets you view Live Data for the vehicle currently under test (see on page 43).

History: Displays the History Page from which you can view data stored in the tablet's memory for previously scanned vehicles (see THE HISTORY PAGE on page 62).

Support: Lets you contact Innova Technical Support or report an issue (See CONTACTING TECHNICAL SUPPORT on page 63).

Settings: Lets you make a number of adjustments and settings to configure the tablet to suit your particular needs (see SETTINGS on page 64).

Email Report: Lets you email report data to yourself, the customer, or another party (see on page)

VIEWING LIVE DATA

You can view Live Data for the currently selected module.

■ While linked to the vehicle, start the engine.

■ From the Main Menu (see THE MAIN MENU on page 60), tap ⌇ **Support** to place the tablet in Live Data Mode (see LIVE DATA MODE on page 43).
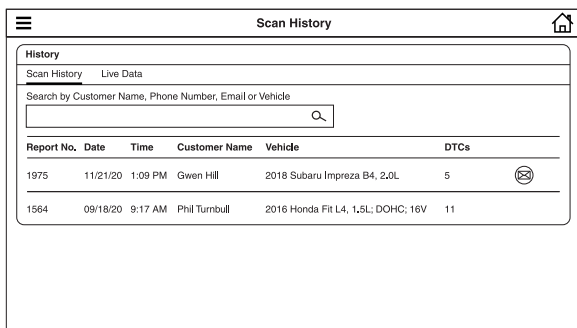
THE HISTORY PAGE

The tablet stores the results of the most recent scans you have performed. The History page lets you retrieve and view results for previous scans from the tablet's internal memory. The History Page includes two tabs; **Scan History** and **Live Data**.

■ From the Main Menu (see THE MAIN MENU on page 60), tap 📖 **History**.

The Scan History Tab

Entries on the **Scan History** tab are listed in reverse chronological order (most recent scan first). Each entry in the list provides the following information:

■ **Report No.** – The auto-generated reference number for the scan.

■ **Date** – The date on which the scan was performed.

■ **Time** – The time at which the scan was performed.

■ **Customer Name** – The name of the customer, if entered (see Editing Customer Information on page 35).

■ **Vehicle** – The year, make, model and engine size of the vehicle for which the scan was performed.

■ **DTCs** – The total number of Diagnostic Trouble Codes (DTCs) retrieved by the scan.

Tap an entry on the **Scan History** tab to view scan results.

The Live Data Tab

Entries on the **Live Data** tab are listed in reverse chronological order (most recent scan first). Each entry in the list provides the following information:

	Scan History	
History		
Scan History	Live Data	

Date	Time	Vehicle
11/21/20	1:09 PM	2018 Subaru Impreza B4, 2.0L
09/18/20	9:17 AM	2016 Honda Fit L4, 1.5L; DOHC; 16V

- **Date** – The date on which the recording was made.

- **Time** – The time at which the recording was made.

- **Vehicle** – The year, make, model and engine size of the vehicle for which the recording was made.

Tap an entry on the **Live Data** tab play back recorded data.

	Live Data	
	View Graph Unselect Parameters ▶ Play	
☐ Fuel Sys 1		OL B2
☐ Fuel Sys 2		OL
☑ Calc Load		42.0%
☑ ECT		190°F
☑ STFT B1		53.1%

- Tap **Play** to start the playback.

- Tap **Pause** to pause the playback.

- Tap **Stop** to stop the playback.

- If desired, use the **View Table** and **View Graph** buttons to toggle the display between graph mode and tabular mode during playback.

CONTACTING TECHNICAL SUPPORT

The **Support** option in the Main Menu lets you send an email to Innova Technical Support, or report an issue.

Additional Tests
CONTACTING TECHNICAL SUPPORT

Innova Technical Support is available Monday through Saturday, 6:00AM to 6:00PM, Pacific Time.
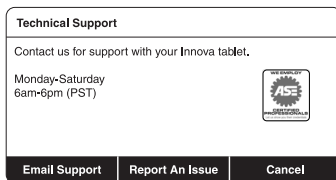
To access Technical Support options:

■ From the Main Menu (see THE MAIN MENU on page 60), tap ⌾ **Support**.

- The Technical Support dialog displays.

Tap Cancel to close the Technical Support dialog without sending a message to Innova Technical Support.

```
Technical Support

Contact us for support with your Innova tablet.

Monday-Saturday
6am-6pm (PST)                    ASE
                              CERTIFIED

Email Support    Report An Issue    Cancel
```
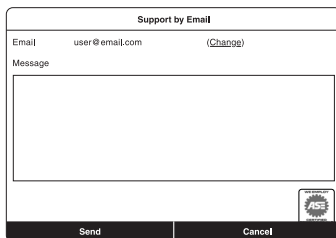
To email Technical Support:

1. Tap **Email Support**.

   ■ The Support by Email dialog displays.

   ■ The **Email** field shows the most recently entered "From" email address for the tablet. If no "from" address was previous entered, the **Email** field shows an empty text box.

```
Support by Email

Email      user@email.com      (Change)
Message

                                ASE

Send                Cancel
```

You MUST provide a personal email address to receive a reply from Innova Technical Support via email.

2. To enter an **Email** address for the first time:

   ■ Tap the **Email** text box, then enter your personal email address using the keyboard (see USING THE KEYBOARD on page 4).

3. To change an existing **Email** address:

   ■ Tap **Change**. The current **Email** address displays in an editable text box.

   ■ Tap the current **Email** address, then enter your personal email address using the keyboard (see USING THE KEYBOARD on page 4).

4. Tap the **Message** text box, then enter your message to Innova Technical; Support using the keyboard (see USING THE KEYBOARD on page 4).

5. Tap the **Send** button to send your email to Innova Technical Support.
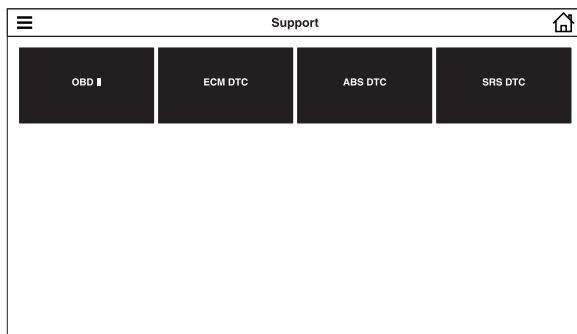
To cancel your message without sending, tap Cancel to return to the Technical Support dialog.

■ A confirmation message displays. Tap **Close** to close the message.

To report an issue:

1. Tap **Report An Issue**.

    ■   The Report an Issue page displays.

≡	Support	⌂

OBD ▮	ECM DTC	ABS DTC	SRS DTC

2. Tap the type of issue you wish to report; **OBD II**, **ECM DTC**, **ABS DTC** or **SRS DTC**.

    ■   An instructional dialog displays. Once the selected feature is reached, the data log will begin and automatically stop logging after the feature.

3. Tap the **Home** button to begin.

    ■   The display returns to the Home Page, and the **Data Log On** icon shows in the lower right corner of the screen.

4. Once the selected feature is reached, the data log will begin and automatically stop logging after the feature.

    ☞   *To end data logging manually, tap the **Data Log On** icon, then tap **Stop Logging** on the instructional dialog.*

    ■   The Report Issue screen displays.

    ■   The screen shows **Vehicle Information** (vehicle year, make, mode and VIN), **Tool Information** (**Firmware**, **Bootloader** and **Database** version numbers), and your **Email** address (if previously entered).

Report Issue	
Vehicle Information	**Tool Information**
2018 Volvo S60	Firmware: V18.02.28
VIN: YV126MFL5J1254638	Bootloader: V18.02.03
App: 0.1.56	Database: V18.05.32
Email: me@me.com	Phone:
(Change)	
Issue Description	
Submit	**Cancel**

5. To enter an **Email** address for the first time:

    ■   Tap the **Email** text box, then enter your personal email address using the keyboard (see USING THE KEYBOARD on page 4).

6. To change an existing **Email** address:

    ■   Tap **Change**. The current **Email** address displays in an editable text box.

■ Tap the current **Email** address, then enter your personal email address using the keyboard (see USING THE KEYBOARD on page 4).

7. If desired, tap the **Phone** text box, then enter your phone number using the keyboard (see USING THE KEYBOARD on page 4).

8. Tap the **Issue Description** text box, then enter a brief description of the issue (see USING THE KEYBOARD on page 4).

9. Tap the **Submit** button to send your issue report and associated data log to Innova Technical Support.
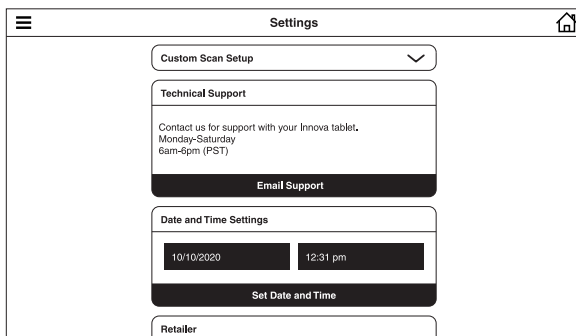
SETTINGS

The tablet lets you make a number of adjustments and settings to configure the tablet to suit your particular needs. The following functions can be performed:

■ **Custom Scan Setup:** Lets you specify the data to be included when performing a Custom Scan.

■ **Technical Support:** Lets you send an email to Innova Technical Support.

■ **Date and Time Settings:** Lets you set the current date and time for the tablet.

■ **Retailer:** Lets you specify the name of the retailer from which you purchased the tablet to ensure the tool provides you with the best possible parts recommendations.

■ **Wifi Settings**: Lets you connect the tablet to a local Wifi network.

■ **Regional Settings**: Lets you set the unit of measurement for the tablet's display to USA or metric.

■ **Idle Time Settings** – Lets you set the length of "idle" time before the tablet enters "standby" mode.

■ **Language** – Lets you set the display language for the tablet to English, French or Spanish.

■ **Volume Settings**: Lets you adjust the volume level of the tablet speaker.

■ **Brightness Settings**: Lets you adjust the brightness of the display screen.

■ **DLC Locator** – Lets you find the location of the Data Link Connector (DLC) for a specified vehicle.

■ **About** – Shows the tablet's Software Version, Tool Version and other related specifications, and lets you check for software updates or report an issue with the tablet.

To enter the Settings mode:

1. Tap the ≡ **Menu** icon to open the Menu panel, then tap ⚙ **Settings**.

■ The Settings page displays.

2. Swipe up or down to scroll to the desired option.

3. Make adjustments and settings as follows.

Setting Custom Scan Options

1. Scroll the Settings page to the **Custom Scan Setup** field.

2. Tap the ⋀ icon to expand the **Custom Scan Setup** field.

■ The Custom Scan Setup field is divided into three subsections; **General Information**, **Enhanced Information** and **Service Information**.

■ Each subsection contains a list of data elements that can be included or excluded in Custom Scans (see Performing a Custom Scan on page 24).

3. Use the slide switches associated with each data element to configure the elements as desired:

■ Slide the switch to the right ⬤ to *include* the associated data element in the Custom Scan.

■ Slide the switch to the left ⬤ to *exclude* the associated data element from the Quick Scan.

4. When all data elements have been configured as desired, tap **Save Settings** to save your changes.

■ A confirmation message displays. Tap **Close** to close the message.
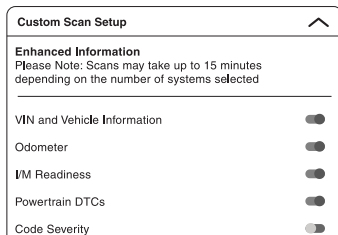
Emailing Technical Support

☞ *Innova Technical Support is available Monday through Saturday, 6:00AM to 6:00PM, Pacific Time.*

1. Scroll the Settings page to the **Technical Support** field.

2. Tap **Email Support**.

   ◾ The Support by Email dialog displays.

   ◾ The **Email** field shows the most recently entered "From" email address for the tablet. If no "from" address was previous entered, the **Email** field shows an empty text box.

   ☞ *You MUST provide an email address to receive a reply from Innova Technical Support via email.*

3. To enter an **Email** address for the first time:

   ◾ Tap the **Email** text box, then enter your personal email address using the keyboard (see USING THE KEYBOARD on page 4).

4. To change an existing **Email** address:

   ◾ Tap **Change**. The current **Email** address displays in an editable text box.

   ◾ Tap the current **Email** address, then enter your personal email address using the keyboard (see USING THE KEYBOARD on page 4).

5. Tap the **Message** text box, then enter your message to Innova Technical; Support using the keyboard (see USING THE KEYBOARD on page 4).

6. Tap **Send** to send your email to Innova Technical Support.

   ☞ *To cancel your message without sending, tap **Cancel** to return to the **Technical Support** field.*

   ◾ A confirmation message displays. Tap **Close** to close the message.

Setting Date and Time Formats

1. Scroll the Settings page to the **Date and Time Settings** field.

   ◾ The **Date and Time Settings** field shows the currently set date and time for the tablet.

2. To specify the current date:

   ◾ Tap the date format field.

     - The Set Date dialog displays.

■ Scroll the "month," "day," and "year" fields to set the current calendar date, then click **DONE**.

☞ *Click CANCEL to close the Set Date dialog and retain the previous date.*

3. To specify the current time:

■ Tap the time format field.

- The Set Time dialog displays.

■ Scroll the "hour," "minute," and "am/pm" fields to set the current time, then click **DONE**.

☞ *Click CANCEL to close the Set Time dialog and retain the previous time.*

4. Tap **Set Date and Time** to save your changes.

■ A confirmation message displays. Tap **Close** to close the message.

Specifying the Retailer

1. Scroll the Settings page to the **Retailer** field.

■ If you previously specified a retailer, the name of the retailer is shown in the upper left corner of the

Retailer field.

2. Tap **Change Retailer**.

■ The Select Retailer dialog displays.

3. Tap the **Enter Retailer** text box, then enter the name of the location from which you purchased your tablet (or other local retailer, as desired) using the keyboard (see USING THE KEYBOARD on page 4).

| Retailer |
| Amazon |
| **Change Retailer** |

| Select Retailer |
| Tell us where yu purchased your tablet for better part recommendations. |
| Enter Retailer |
| Enter Retailer |
| **Save**   Cancel |

4. When the desired retailer has been entered, tap the **Save** button to save your changes and return to the **Retailer** field.

☞ *To cancel changes and retain the current retailer, tap Cancel to return to the Retailer field.*

Connecting to a Wifi Network

1. Scroll the Settings page to the **Wifi Settings** field.

■ If you are currently con-nected to a Wi-Fi network, the network name is shown in the upper left corner of the **Wifi Settings** field.

| Wifi Settings |
| MyWiFiNetwork |
| **Change Network** |

2. Tap **Change Network**.

- The Sign In To Your Wi-Fi Network dialog displays.

- The dialog lists all available Wi-Fi networks within range of the tablet.

3. Swipe up or down to scroll to the desired Wi-Fi network, then tap the network name.

Sign In To Your Wi-Fi Network	
Network Name	**Strength**
WifiNetwork1	📶
WifiNetwork2	📶
WifiNetwork3	📶
WifiNetwork4	📶
Cancel	

*To cancel changes and retain your current network connection, tap **Cancel** to return to the **Wifi Settings** field.*

- The Enter Password dialog displays.

4. Tap the **Password** text box, then enter the Wi-Fi network password using the keyboard (see USING THE KEYBOARD on page 4).

- As you type, the password displays as a series of bullets by default. Tap **show** to show the password as you type. Tap **hide** to display the password as bullets.

Sign In To Your Wi-Fi Network	
Password	show
Connect	**Cancel**

5. When the password has been entered, tap the **Connect** button to save your changes and connect to the selected Wi-Fi network.

*Tap **Cancel** to cancel your changes and return to the Sign In To Your Wi-Fi Network dialog to select a different network.*

- The screen returns to the **Wifi Settings** field, with the network name shown in the upper left corner of the **Wifi Settings** field.

Configuring Regional Settings

1. Scroll the Settings page to the **Regional Settings** field.

2. Tap the currently selected unit of measurement to display the Select Unit of Measurement menu. Select the radio button for the desired unit of measurement, then tap **OK**.

Regional Settings	
US	▼

*Click **CANCEL** to close the Select Unit of Measurement menu and retain the previously selected unit of measurement.*

Setting the Display Language

> Language
> English ▼

1. Scroll the Settings page to the **Language** field.

2. Tap the currently active language to display the Select Language menu. Select the radio button for the desired language, then tap **OK**.

> *Click **CANCEL** to close the Select Language menu and retain the previously selected display language.*

■ The display refreshes to show text in the selected language.

Idle Time Settings

> Idle Time Settings
> 10 mins ▼

1. Scroll the Settings page to the **Idle Time Settings** field.

2. Tap the currently active idle time value to display the Select Idle Time menu. Select the radio button for the desired idle time value, then tap **OK**.

> *Click **CANCEL** to close the Select Idle Time menu and retain the previously selected idle time value.*

Adjusting Speaker Volume

1. Scroll the Settings page to the **Volume Settings** field.

> Volume Settings
> ◀ ▬▬▬▬▬▬▬▬▬▬ 🔊

2. Use the Volume "slider" to increase or decrease speaker volume:

■ Touch and slide right to make the volume louder.

■ Touch and slide left to make the volume softer.

> *The current Volume setting shows above the slider as you adjust the slider position.*

Adjusting Display Brightness

1. Scroll the Settings page to the **Brightness Settings** field.

> Brightness Settings
> ☀ ▬▬▬▬▬▬▬▬▬▬ ☀

2. Use the Brightness "slider" to increase or decrease display brightness:

■ Touch and slide right to make the display brighter.

■ Touch and slide left to make the display darker.

> *The current Brightness setting shows above the slider as you adjust the slider position.*
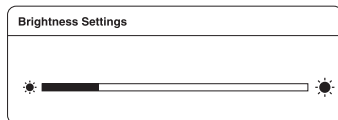
Using the DLC Locator

1. Scroll the Settings page to the **DLC Locator** field.

2. Tap **Make** to display the Select Make menu. Select the radio button for the desired vehicle manufacturer, then tap **OK**

3. Tap **Year** to display the Select Year menu. Select the radio button for the vehicle model year, then tap **OK**.

4. Tap **Model** to display the Select Model menu. Select the radio button for the desired vehicle model, then tap **OK**.

5. Tap the **Search** button.

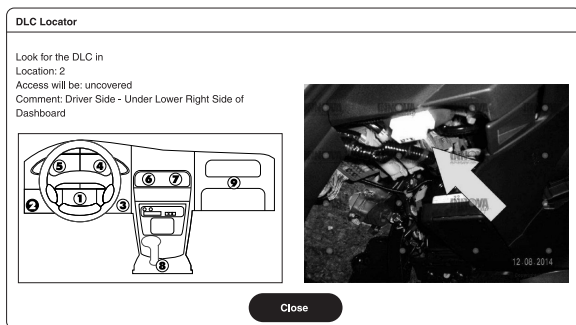   ■ The DLC Locator screen for the selected vehicle displays.

   ■ The DLC Location screen shows a description of the DLC location and whether the DLC is "covered" or "uncovered," and includes a picture of the DLC location.

6. Tap the **Close** button to close the DLC Locator screen and return to the Settings page.

Viewing "About" Information

1. Scroll the Settings page to the **About** field.

   ■ The field shows the tablet's current **Software Version**, **Tool Version**, firmware version (**FW**), database version (**DB**), bootloader version (**BL**), **Android Version** and **Build Number** for the tablet.

2. Tap **Check for Updates** to check for software updates (see Updating the Tablet Software on page ##).

3. Tap **Report An Issue** to open the Support page (see Contacting Technical Support on page ##).

Exiting the Settings Mode

■ Tap the ☰ **Menu** icon to open the Menu panel, then tap ⌂ **Home** to return to the Home page.

LIMITED ONE YEAR WARRANTY

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

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

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

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

SERVICE PROCEDURES

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

USA & Canada:

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

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

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

Web: www.innova.com

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