PDL3000 Scanner User Manual

EAZ0076L02B Rev. A

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Safety Information

For your own safety and the safety of others, and to prevent damage to the equipment and vehicles upon which it is used, it is important that the accompanying *Important Safety Instructions* be read and understood by all persons operating, or coming into contact with, the equipment. We suggest you store a copy near the unit in sight of the operator.

This product is intended for use by properly trained and skilled professional automotive technicians. The safety messages presented throughout this manual are reminders to the operator to exercise extreme care when using this test instrument.

There are many variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the individual doing the work. Because of the vast number of test applications and variations in the products that can be tested with this instrument, we cannot possibly anticipate or provide advice or safety messages to cover every situation. It is the automotive technician's responsibility to be knowledgeable of the system being tested. It is essential to use proper service methods and test procedures. It is important to perform tests in an appropriate and acceptable manner that does not endanger your safety, the safety of others in the work area, the equipment being used, or the vehicle being tested.

It is assumed that the operator has a thorough understanding of vehicle systems before using this product. Understanding of these system principles and operating theories is necessary for competent, safe and accurate use of this instrument.

Before using the equipment, always refer to and follow the safety messages and applicable test procedures provided by

the manufacturer of the vehicle or equipment being tested. Use the equipment only as described in this manual.

Read, understand and follow all safety messages and instructions in this manual, the accompanying safety manual, and on the test equipment.

Safety Message Conventions

Safety messages are provided to help prevent personal injury and equipment damage. All safety messages are introduced by a signal word indicating the hazard level.

⚠ DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or to bystanders.

⚠ WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or to bystanders.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury to the operator or to bystanders.

Safety messages contain three different type styles.

- Normal type states the hazard.
- **Bold type states how to avoid the hazard**.
- *Italic type states the possible consequences of not avoiding the hazard*.

An icon, when present, gives a graphical description of the potential hazard.

Example:

⚠ WARNING

Risk of unexpected vehicle movement.

- **Block drive wheels before performing a test with engine running.**

A moving vehicle can cause injury.

Important Safety Instructions

For a complete list of safety messages, refer to the accompanying safety manual.

SAVE THESE INSTRUCTIONS

Contents

Chapter 1 Using This Manual

This manual contains tool usage instructions. Some of the illustrations shown in this manual may contain modules and optional equipment that are not included on your system. Contact your sales representative for availability of other modules and optional equipment.

1.1 Conventions

The following conventions are used.

1.1.1 Bold Text

Bold emphasis is used in procedures to highlight selectable items such as buttons and menu options.

Example:

- Press the **OK** button.

1.1.2 Symbols

Different types of arrows are used.

The “greater than” arrow (>) indicates an abbreviated set of selection instructions.

Example:

- Select **Tools > Connect-to-PC**.

The example statement abbreviates the following procedure:

1. Select **Tools** from the home screen.
2. Highlight **Connect-to-PC** on the Tools menu.

3. Select **Connect-to-PC**.

The solid arrows (◄, ►, ▼, ▲) are navigational instructions referring to the four directions of the directional arrow keys.

Example:

- Press the down ▼ arrow.

1.1.3 Terminology

The term “select” means highlighting a button or menu item and pressing the **Accept**, **OK**, **Yes**, or other similar button to confirm the selection.

Example:

- Select **Brightness**.

The above statement abbreviates the following procedure:

1. Navigate to and highlight the **Brightness** selection.
2. Press the **OK**, or similar, button.

1.1.4 Notes and Important Messages

The following messages are used.

Notes

A NOTE provides helpful information such as additional explanations, tips, and comments.

Example:

NOTE:
For additional information refer to...

Important

IMPORTANT indicates a situation which, if not avoided, may result in damage to the test equipment or vehicle.

Example:

IMPORTANT:
Do not disconnect the data cable while the Scanner is communicating with the ECM.

1.1.5 Procedures

An arrow icon indicates a procedure.

Example:

To change screen views:

1. Select the **Graph** icon.
   The dropdown menu displays.
2. Select an option from the menu.
   The screen layout changes to the format selected.

Chapter 2 Getting Started

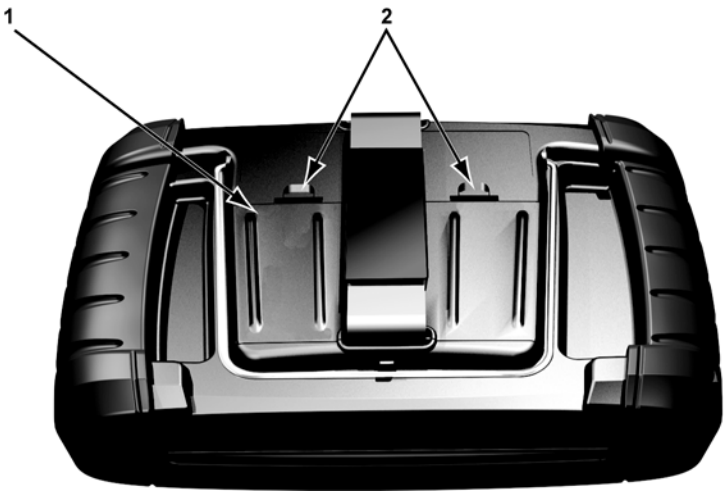
This chapter details the initial steps required to get you new scan tool operational. Please read these instructions carefully to get started using you new diagnostic tool.

2.1 Installing the Batteries

The six AA batteries provided with your scan tool kit must be installed before using the tool.

To install the batteries:

1. Depress the two battery cover lock tabs and lift off the battery cover.



1— Battery Cover

2— Lock Tabs

Figure 2-1 *Battery replacement*

2. Observing proper polarity (shown on the battery slots), install six new AA batteries.

IMPORTANT:
Your scan tool can be damaged if the battery polarity is incorrect. Refer to the diagram in the battery compartment on the rear of the tool for correct battery polarity.

3. Fit the battery cover onto the housing.

2.2 Powering Up

Press the **Power** key on the front of the unit to switch the scan tool on. The system boots up, then opens the Home screen (Figure 2-2).

2.3 Home Screen

1— Titlebar

2— Main Body

Figure 2-2 *Sample Home screen*

The main body of the Home screen has four selectable buttons, one for each of the primary scan tool functions. These are explained briefly in the next section and discussed in detail in the Navigation chapter.

The titlebar, which runs across the top of the screen, provides information about the current screen or a description of the defined test vehicle. The title bar contains no selectable items. A graphic indicator at the right edge of the toolbar shows the status of the tool power supply:

Table 2-1 *Power supply icons*

Icon	Definition
	Indicates power is being supplied by the internal batteries
	Indicates the internal batteries are weak and need replacing
	Indicates power is being supplied by the AC/DC power supply
	Indicates power is being supplied by the vehicle
	Indicates the scan tool is actively communicating with a vehicle
	Indicates the scan tool is actively communicating with a personal computer

2.3.1 Home Screen Buttons

The Home screen buttons allow you to select which of the primary scan tool functions to use. Table 2-2 on page 9 gives brief descriptions of the button operations.

Table 2-2 *Home screen buttons*

Name	Button	Description
Vehicle Manufacturers		Select to open a list of available vehicle manufacturers and begin the process of identifying the test vehicle.
OBD-II/EOBD		Select to perform generic OBD-II/EOBD system tests without first identifying a specific vehicle.
Previous Vehicle & Data		Select to reenter the Identification of a recently tested vehicle, or to access saved data files.
Tools & Setup		Select to adjust tool settings to your personal preferences, to access scan tool system information, and perform other special operations.

Use your finger tip to select from the Home screen buttons.

2.4 Registration and Activation

Your new diagnostic tool must be registered and activated before it becomes fully functional. This is done on the internet using the ShopStream Connect software provided.

IMPORTANT:

ShopStream Connect must be installed on your personal computer (PC) first, before you can activate you handheld device. Insert the CD provided in the kit into the CD ROM drive of your PC and follow the on-screen prompts.

After installing ShopStream Connect on your PC, connect the diagnostic tool to the PC using the following procedure:

To connect to a PC:

1. Power on the scan tool.
2. Select **Tools** from the Home screen.
3. Select **Connect-to-PC** from the Tools menu.
4. Follow any additional on-screen instructions.
5. Connect the scan tool and PC with the USB cable:
   a. Plug the large end of the USB cable into a USB port on your PC.
   b. Plug the small end of the USB cable into the USB port on top of the scan tool.

After connecting the scan tool to the PC, activate the unit using the following procedure.

To activate the scan tool:

1. On the PC, launch the ShopStream Connect application.

   ShopStream Connect should recognize a new unit and open a dialog box (Figure 2-3).

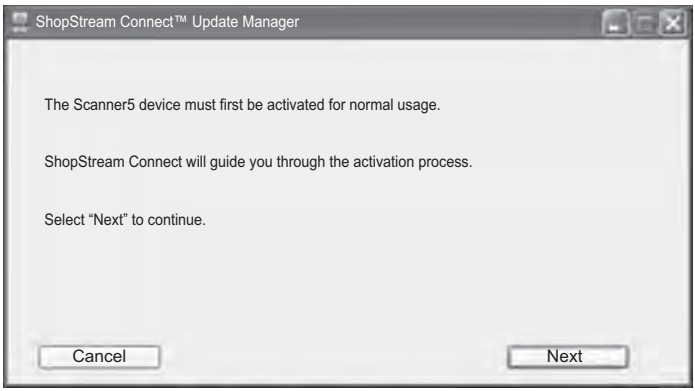


Figure 2-3 *Sample opening dialog box*

2. Select **Next** and the license agreement screen opens (Figure 2-4).

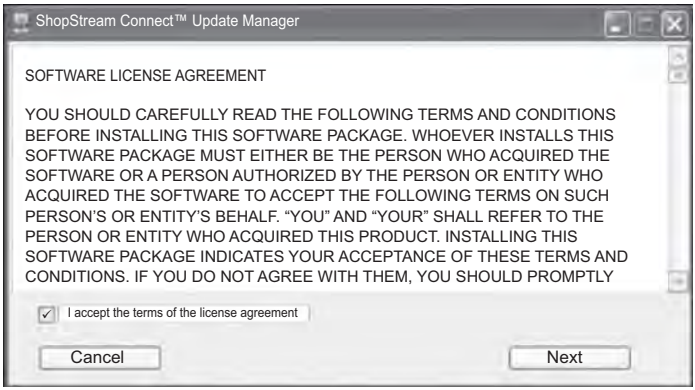


Figure 2-4 *Sample license agreement*

3. Read the agreement, check the box to accept it, then select **Next** to continue.

   The first of two information screens opens.
4. Fill in the required fields and select **Next** to continue.
5. Fill in the required fields on the second information screen and select **Next** to continue (Figure 2-5).

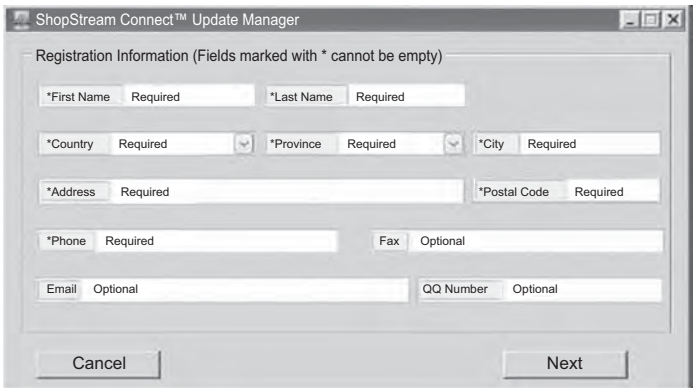


Figure 2-5 *Sample information screen*

6. Select **Next** to continue when the ready to activate screen displays.

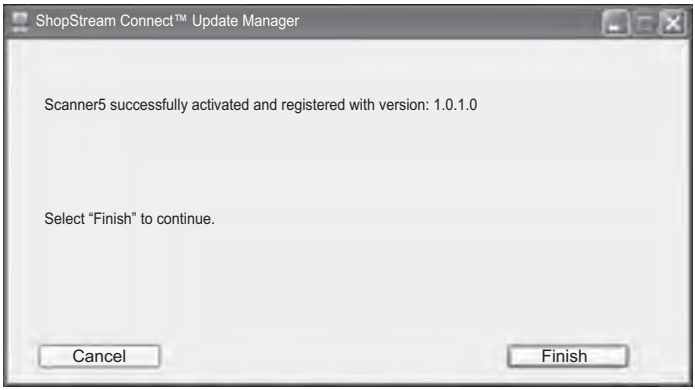


Figure 2-6 *Sample activation successful*

7. Select **Finish** to complete the activation when prompted (Figure 2-6).

2.5 Connecting to a Vehicle

The data cable is used to connect the scan tool to the data link connector (DLC) of the test vehicle. Connection instructions are provided on the scan tool screen once the test vehicle has been identified.

To connect to a test vehicle:

1. Make sure the scan tool is turned on.
2. From the Home screen select **Vehicle Manufacturers**, then highlight and make the appropriate selections for the vehicle.
3. Follow the screen prompts to identify the vehicle you are testing.
4. Fit the 26-pin end of the data cable to the connector on scan tool and secure it with the captive screws.
5. Select the appropriate adapter (as previously identified by the scan tool) and attach it to the data cable.
6. Connect the adapter to the DLC of the vehicle.
7. Switch the vehicle ignition on.
8. Select the menu option you wish to investigate.

2.6 The Demonstration Program

The demonstration program allows you to become familiar with many of the test capabilities of the tool without connecting to a vehicle. Sample data and mock test results help you learn the menus and basic operations.

To start the demonstration program:

1. Tap **Vehicle Manufacturers** on the Home screen.

   The manufacturer menu, which lists all of the makes available for testing, displays. The list also includes a Demonstration button.

2. Tap the **Demonstration** button to select it.

   A confirmation message displays.

3. Select **OK** to on the confirmation screen to load the selected database.
4. Follow the on-screen instructions and select as needed until the Systems menu displays.
5. Select from any of the systems listed, then select from the submenus.

IMPORTANT:
Do not connect a vehicle to the scan tool while in the Demonstration mode.

There is also a demonstration program for OBDII/EOBD vehicles. To access the demonstration, select Training Mode from the OBD-II/EOBD main menu.

2.7 Powering Down

Use the **Power** key to turn the scan tool off.

Holding the **Power** key down for 4 seconds forces the unit to shut down in the event that it becomes nonresponsive.

IMPORTANT:

Vehicle communication must be terminated before shutting down the scan tool. A warning message displays if a shut down is attempted while the scan tool is communicating with the vehicle. Forcing a shut down while communicating may lead to ECM problems on some vehicles. Always exit vehicle communications before powering down.

To power off the unit:

1. Press **N** until you reach the Home screen.

   A stopping communication message appears briefly before the Home screen displays.
2. Disconnect the test adapter from the vehicle connector.
3. Press the **Power** key.

   The Turn off dialog box displays.
4. Press ✓ to turn the power off, or press **N** to cancel and test a different vehicle.

2.7.1 Emergency Shutdown

In case of emergency, press and hold the Power key to force a shutdown.

Chapter 3 Introduction

The scan tool interfaces with the electronic control system of a vehicle to retrieve diagnostic trouble codes (DTCs), access serial data stream information, and command bidirectional tests. Various vehicle control systems, such as engine, transmission, and antilock brake system (ABS), are readily diagnosed using this scan tool. The scan tool is capable of graphing up to six live data parameters on a single screen, and also includes an extensive database of vehicle-specific troubleshooting information.

This chapter describes the construction of the scan tool and addresses the use of the basic hardware controls and features in the following sections:

3.1 Functional Description

1— ✓ Key (Yes, Accept, or Continue)

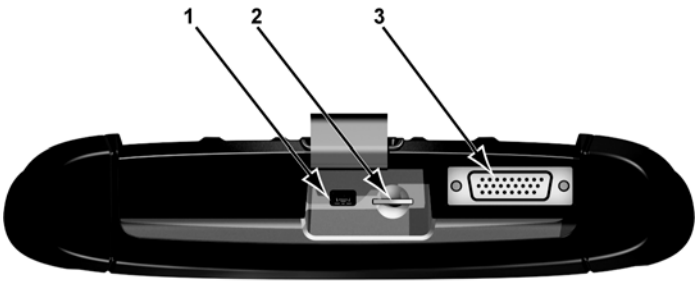
2— Directional Keys; left (◄), right (►), up (▲), and down (▼)

3— X Key (No, Cancel, or Return)

4— Shortcut Key

5— Power Key

Figure 3-1 *Front view*

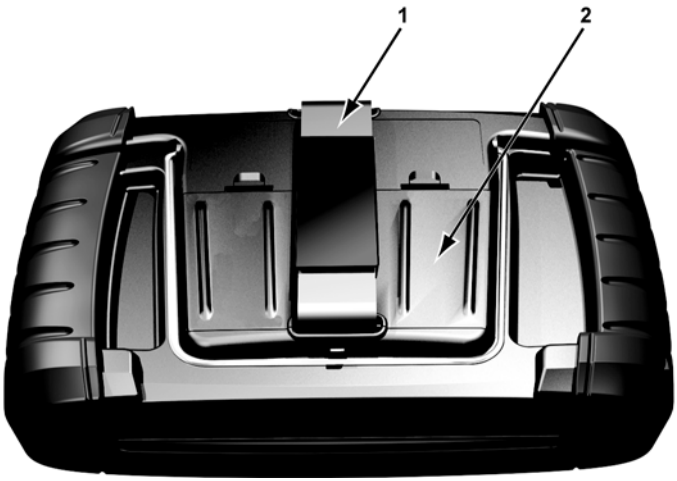


1— Mini USB Client Port

2— SD (secure digital) Card Port

3— Data Cable Port

Figure 3-2 *Top view*



1— Hand Strap

2— Battery Compartment Cover

Figure 3-3 *Back view*

3.2 Technical Specifications

Processor:
Motorola

Operating System
SMX

Touch Screen
Resistive Touch Panel

Display:
5.6 inch diagonal, LCD TFT
640 x 480 resolution SWVGA
24 bit color

Batteries:
(6) 1.5V AA

DC Jack Operating Voltage

8V to 32V DC

Dimensions:

Width:

9.15 inches

232.4 mm

Height:

5.85 inches

148.6 mm

Depth:

1.85 inches

47.0 mm

Weight (including batteries):

2.0 lbs.

907 g

Operating Temperature Range (ambient):

At 0 to 90% relative humidity (non-condensing)

32 to 113°F

0 to 45°C

Storage Temperature (ambient):

At 0 to 70% relative humidity (non-condensing)

–4 to 140°F

–20 to 60°C

Environmental Conditions:

This product is intended for indoor use only

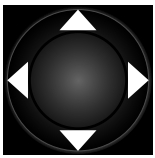
This product is rated for Pollution Degree 2 (normal conditions)

Power Supply:

Supply Rating; 19 VDC. 3.42A

3.3 Control Keys

There are five control keys located on the right side of the unit near the handgrip:

Key	Icon	Description
Accept, Yes		Selects a menu or program, advances to the next screen, or provides a yes answer to a question on the screen.
Directional Arrows		Moves the highlight on the display screen up, down, left, and right, as indicated by the arrows.
Cancel, No		Exits a menu or program, returns to the previous screen, or provides a no answer to a question on the screen.
Shortcut		A function key that can be programmed to provide a shortcut for performing a variety of routine tasks.
Power, On/Off		Turns the unit on and off. Also, press and hold for 5 seconds for emergency shutdown.

All other tool operations are controlled through the touch screen.

3.3.1 Accept (✓) Key

The ✓ key is used to do the following:

- To select an item that was highlighted using the directional keys.
- To advance to the next screen in a series.
- To answer Yes when a Yes or No choice is given.

3.3.2 Directional Keys

The directional, or arrow, keys move the cursor or highlight in their respective directions:

- Up (▲)
- Down (▼)
- Left (◄)
- Right (►)

3.3.3 Cancel (X) Key

The **X** key is used to do the following:

- To exit a menu or program.
- To close an open list and return to the previous menu.
- To answer No when a Yes or No choice is given.

3.3.4 Shortcut Key

Use the **Shortcut** key to quickly perform routine tasks with a single key stroke. See Configure Shortcut Key on page 65 for additional information.

3.3.5 Power Key

The **Power** key powers up the tool, and turns it off.

3.4 Power Sources

Your Display Device can receive power from any of the following sources:

- Internal Batteries
- AC/DC Power Supply
- Vehicle Power

3.4.1 Internal Batteries

The scan tool can be powered from the internal batteries. New standard batteries or fully charged rechargable batteries provide sufficient power for about 2 hours of continuous operation.

IMPORTANT:
The internal batteries are not intended to power the scan tool during vehicle testing. Make sure vehicle power is available to the scan tool when performing vehicle tests.

3.4.2 AC/DC Power Supply

The scan tool can be powered from a standard wall socket using the AC/DC power supply and power adapter. The power adapter fits to the data cable connector on top of the scan tool. The jack on the output cable of the AC/DC power supply attaches to the power adapter.

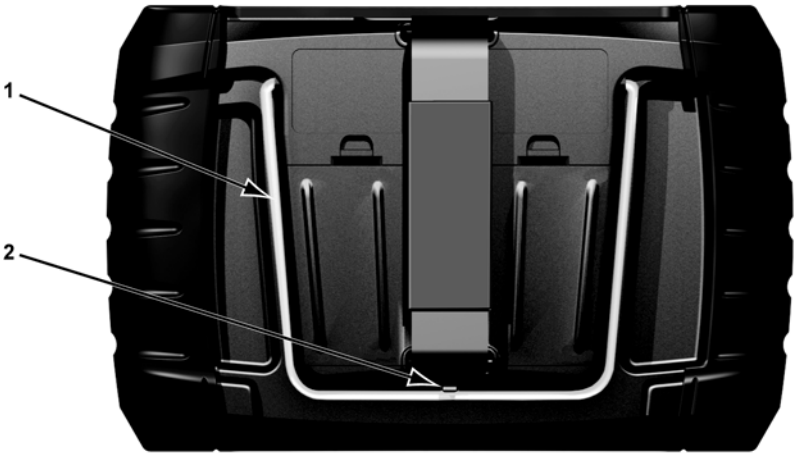
3.4.3 Vehicle Power

The scan tool receives power from the test vehicle when it is connected to a powered data link connector (DLC) with the data cable. All OBD-II/EOBD compliant vehicles are required to have battery power available on the DLC. If the scan tool does not power on when connected to an OBD-II/EOBD DLC, there may be a circuit problem on the vehicle.

Certain vehicles do not provide vehicle power on the DLC. For these applications, a separate cable adapter and power cable are needed to power the unit. Optional data cable adapters are available for testing vehicle from a number of manufacturers. Contact your sales representative for availability. The optional power cable connects to a port on the cable adapter.

3.5 The Stand

The built-in stand extends from the back of the unit to allow hands-free viewing. The stand clips into the unit for storage and pivots out so that the display is at an angle when in use.



1— Stand

2— Retaining Clip

Figure 3-4 *Stand in closed position*

Chapter 4 Navigation

This chapter describes the scan tool screen layout, how to navigate the interface, and how to make selections using screen menus and buttons. The various types of messages that display while using the tool are also explained here.

4.1 Screen Layout

Scan tool screens (Figure 4-1) typically include the following sections:

1— Title bar shows test and tool status

2— Toolbar contains test controls

3— Main body displays menus and test data

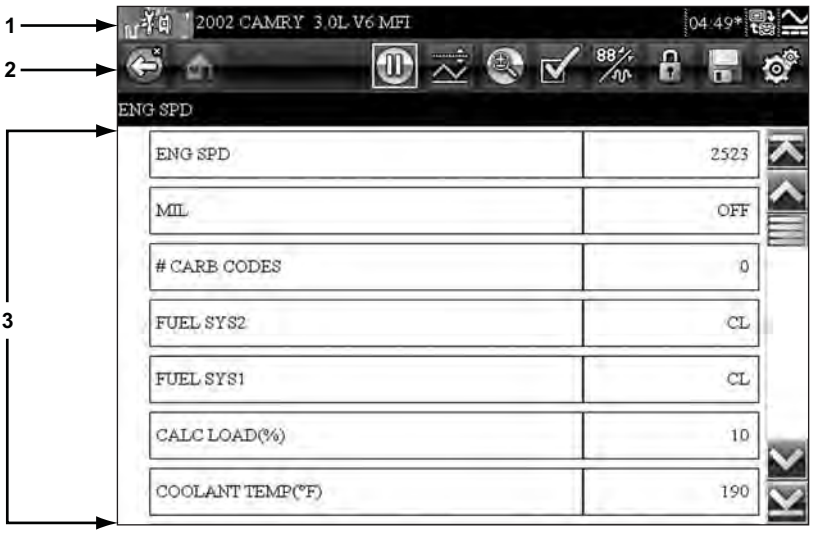


Figure 4-1 *Sample scan tool screen*

4.1.1 Title Bar

The title bar at the top of the screen, provides basic information about current tool operating conditions. Title bar options vary depending upon vehicle make and model, what test is being performed or what menu is selected. Title bar information may include:

- The identification (ID) of the test vehicle
- The name of the active menu or database
- A power source indicator
- A vehicle communication indicator

Depending upon what is being displayed in the main body of the screen, either the vehicle ID or the active menu is shown at the left side of the title bar.

An icon at the far right side of the title bar indicates whether the tool is being powered by the internal batteries, the test vehicle, or the AC\DC power supply.

A communication icon displays to the left of the power source indicator whenever the scan tool is actively communicating with a test vehicle or a personal computer.

4.1.2 Toolbar

The toolbar, located under the title bar, contains a number of selectable buttons that control tool functions. What buttons appear on the toolbar varies, as only buttons that are active or available for the current screen and test mode display. A brief description of common toolbar button operations are shown in Table 4-1 on page 25. Additional buttons appear on the toolbar when special operations are available. These buttons are explained in the Operations chapter.

Table 4-1 *Data toolbar buttons (part 1 of 2)*

Button	Icon	Function
Back		Returns to the previously viewed screen. This button is always at the left-hand edge of the toolbar.
Home		Returns to the Home screen. This button is always alongside the Back button on the left side of the toolbar.
Pause		Indicates live data from the vehicle is being displayed.
Play		Indicates the data being displayed is paused when reviewing a movie.
Clear		Erases all data in the buffer and begins a new recording. Selecting opens a confirmation message.
Sort		Determines the order in which the data parameters are listed.
PID Triggering		Allows you to set, arm, and clear threshold values to automatically begin recording data.
Zoom		Increases and decreases the scale of the data graphs.
Custom Data List		Allows you to select which parameters to display from the list. This button displays when viewing a data list.
View		Switches between text and graph display modes. This button displays when viewing a data list.

Table 4-1 *Data toolbar buttons (part 2 of 2)*

Button	Icon	Function
Lock/Unlock		Locks or unlocks the highlighted parameter. This button displays when viewing a data list.
Save		Saves the current datastream information to tool memory. Selecting open a menu of options.
Tools		Opens the tools menu, which allows you to adjust basic tool settings.
Previous Frame		Moves back one frame when viewing recorded or paused data.
Next Frame		Moves forward one frame when viewing recorded or paused data.

A color-coded frame around the toolbar buttons indicates the status of the button function:

- Blue; available but not currently in use
- White; currently active
- Yellow; currently in focus
- Red; currently selected.

4.1.3 Main Body

The main body of the screen is the lower portion, which displays either a menu of available tests or data from the vehicle. A scroll bar appears on the main body of the screen when there is additional data above or below what is currently shown on the screen (Figure 4-2).

Figure 4-2 *Sample scroll bar*

Touch and drag the slider in the center of the scroll bar to quickly move through the data. Tap the arrowheads at the ends of the scroll bars to move in the direction of the arrow one line or frame at a time. Selecting an arrowhead that points to a line moves you directly to the top, bottom, beginning, or end of the data.

4.2 Screen Messages

There are four types of on-screen messages:

- Loading and connecting
- Confirmations
- Warnings
- Errors

4.2.1 Loading and Connecting Messages

Loading and connecting messages display when the scan tool is performing an internal operation, such as loading a database, initiating a test, or establishing communications with the vehicle. The message automatically clears once the internal operation is complete.

4.2.2 Confirmation Messages

Confirmation messages inform you when you are about to perform an action that cannot be reversed or when an action that requires your confirmation to continue has been initiated.

When a response is not required, the message displays briefly, then disappears.

4.2.3 Warning Messages

Warning messages inform you when completing the selected action may result in an irreversible change or loss of data.

4.2.4 Error Messages

Error messages inform you when a system or procedural error has occurred.

Examples of possible errors include:

- A cable is disconnected.
- A peripheral, such as a printer is powered off.

Chapter 5 Scan Tool Operations

The scan tool establishes a data link to the electronic control systems of the vehicle being serviced. This allows you to retrieve diagnostic trouble codes (DTCs) view live data parameters, and perform tests. Vehicle testing requires connecting the scan tool to the test vehicle using the data cable and test adapters. On screen instructions tell you how to connect the scan tool. Additional connection information can be found in the appropriate vehicle communication software manual for the test vehicle.

5.1 Vehicle Identification

The scan tool information presented is provided by the ECM of the vehicle being tested. Therefore, certain attributes of the test vehicle must be entered into the scan tool to ensure the data displays correctly. This vehicle identification sequence is menu driven, simply follow the screen prompts and make a series of choices. Each selection advances you to the next screen. Exact procedures may vary somewhat by the make, model, and year of the test vehicle.

To identify a vehicle for testing:

1. Tap the **Vehicle Manufacturers** button from the Home screen.

   A list of manufactures displays (Figure 5-1).

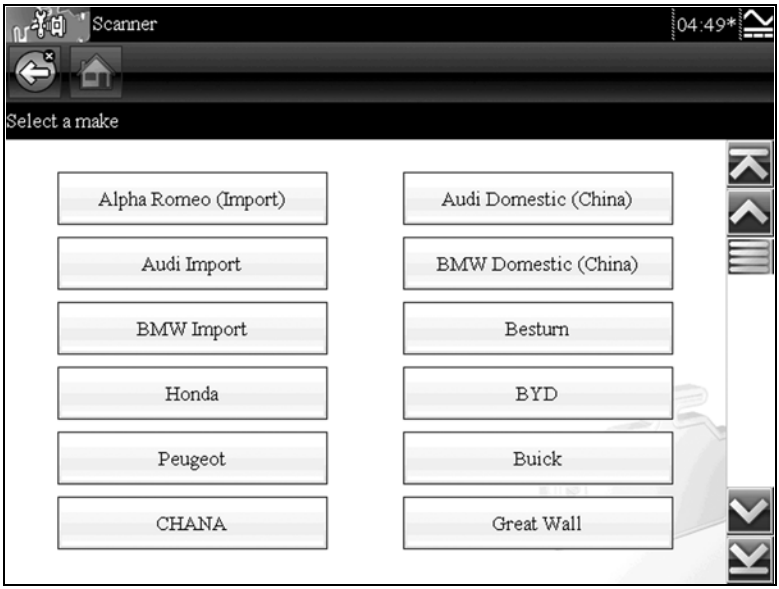


Figure 5-1 *Sample manufacturer list*

2. Select the manufacturer of the test vehicle from the list.

   A model year menu displays.

3. Select the year of the test vehicle from the menu.

   A list of vehicle types or models displays. Several selections may be required to identify the vehicle type and model, follow the screen prompts and enter the required information.

   A confirmation dialog box displays once all the required data has been entered (Figure 5-2).

4. From the Confirm vehicle details dialog box, select:

   a. **OK** to continue.

   b. **Cancel** to return to the engine list.

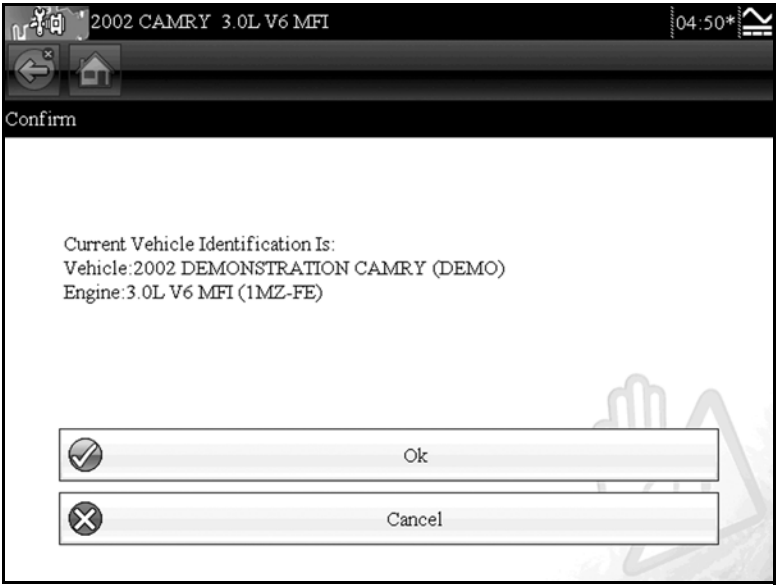


Figure 5-2 *Sample confirmation dialog box*

Select OK and list of systems displays (Figure 5-3).

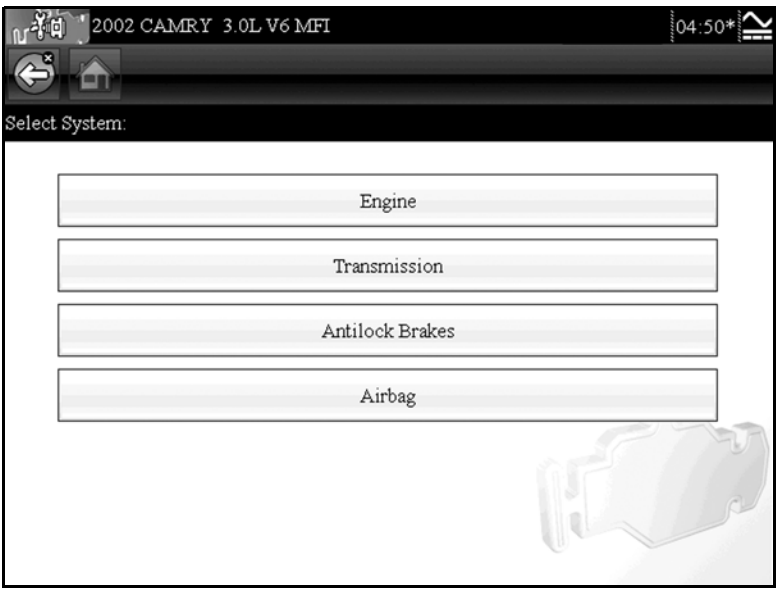


Figure 5-3 *Sample available systems list*

NOTE:
Only the systems available for testing on the identified vehicle are included in the list.

5. Select a system from the list to continue.

The identification sequence is now complete, refer to Connecting to a Vehicle to continue.

5.1.1 Alternative Vehicle Identification

Occasionally, you may identify a test vehicle that the scan tool does not recognize, the database does not support, or has some unique characteristics that prevent it from communicating with the scan tool through the normal channels. In these instances, a menu of alternate choices that allow you to establish communication with the vehicle by other means displays. In addition to being able to identify a different manufacturer, the following alternatives are available:

- **OBDII/EOBD** allows you to perform generic OBD-II or EOBD tests, see OBD-II/EOBD on page 52 for additional information.
- **System ID Mode** allows you to begin the vehicle identification by first selecting the system to be tested. Selecting opens a menu of manufacturers that support this mode.
- **Select by Database** allows you to begin the vehicle identification by first selecting which manufacturer database to load. Selecting opens a menu of available databases.

5.2 Connecting to a Vehicle

Make a selection from the systems available for testing list and instructions for connecting the scan tool to the vehicle with the data cable display on the screen (Figure 5-4).

Figure 5-4 *Sample vehicle connection message*

If an adapter and key are needed, the instructions tell you which ones to use, and also where to locate the vehicle diagnostic connector to perform the selected tests. Refer to the appropriate *Vehicle Communication Software Manual* for additional details.

5.2.1 Cables

A data cables and a cable adapter are used to connect the scan tool to the test vehicle. The 26-pin end of the cable attaches to the data cable port on the scan tool and is secured with two captive screws. The 16-pin end of the OBD-II cable directly plugs into the adapter, which attaches to the data link connector (DLC) of the test vehicle.

On-screen instructions on the scan tool tell you how to connect the data cable once a test vehicle has been identified. The screen message also includes the location of the vehicle diagnostic connector that the cable attaches to for testing the selected system.

All OBD-II vehicles have vehicle battery power (B+) available on the DLC. The auxiliary power cable supplies power for testing non-OBD-II models that do not have B+ available on the diagnostic connector. An OBD-I Data Cable and adapters (optional in some markets) are required for testing non-OBD-II models.

The large end of the auxiliary power cable plugs into the vehicle accessory port. The small end of the cable fits into a power port built into the side of the cable adapter. An in-line fuse on the auxiliary cable provides circuit protection.

To connect the data cable to the vehicle:

1. Follow the on-screen instructions for connecting to the vehicle (Figure 5-4).
2. Once connected, select **Continue**.

   The scan tool establishes communication then displays a list of available tests. If the scan tool is unable to establish a communications link, a no communications message displays.
3. Select an available tests to open a menu of options.

5.2.2 No Communication Message

When the screen displays a no communication message, it means the scan tool and the vehicle control module cannot communicate with each other for some reason.

The following conditions cause a no communication message to display:

- The scan tool is unable to establish a communication link with the vehicle.
- You selected a system for testing that the vehicle is not equipped with (such as ABS).
- There is a loose connection.
- There is a blown vehicle fuse.
- There is a wiring fault on the vehicle.
- There is a circuit fault in the data cable or adapter.
- Incorrect vehicle identification was entered.

Refer to the Vehicle Communication Software manuals for the manufacturer of the test vehicle for additional troubleshooting information.

5.3 Operations

The scan tool allows you to establish a data link to the electronic control systems of the vehicle being serviced in order to view live data parameters and perform tests. You can use selected functional tests, get troubleshooting tips, and get vehicle-specific trouble codes for various vehicle control systems such as engine, transmission, antilock brake system (ABS) and more.

After a system is selected and the scan tool establishes communication with the vehicle, a Main menu, which lists available tests, displays.

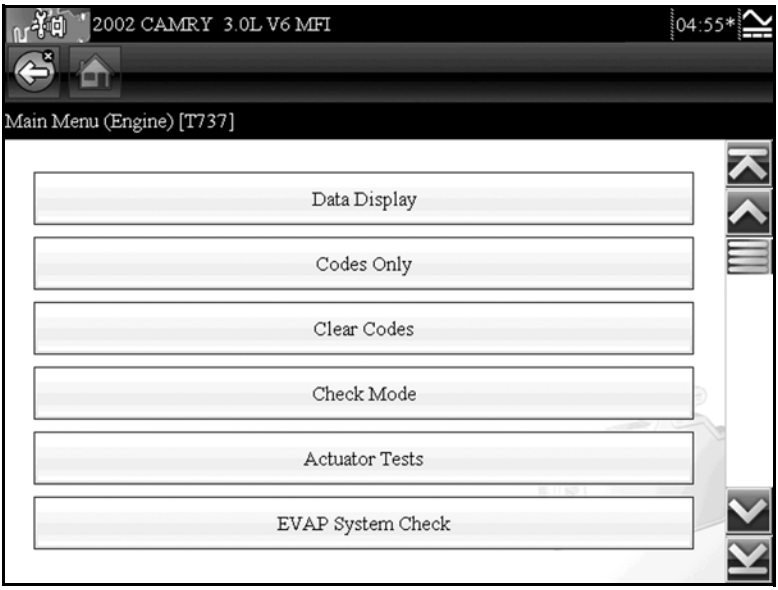


Figure 5-5 *Sample Main menu*

Main menu options vary slightly by the year, make, and model of the test vehicle. The main menu may include:

- **Data Display** displays data parameter information from the vehicle control module. Selecting may open a submenu of viewing options.
- **Service Codes** displays diagnostic trouble code (DTC) records from the vehicle control module. Selecting may open a submenu of viewing options.
- **Clear Codes** erases DTC records and other data from the ECM. This selection is found on a Codes submenu for some models.
- **Functional Tests** provides specific subsystem and component tests. The tests vary depending on the manufacturer and model.
- **Actuator Tests** similar to functional tests, checks the operation of certain actuators, such as solenoid valves and relays.
- **Memory Resets** allows you to reprogram adaptive values for certain components after making repairs. Selecting opens a submenu. These options are found on the Functional Tests Menu for some models.
- **System Tests** provides specific subsystem testing. Performing these tests is similar to functional tests.
- **Generic Functions** lets you access certain available Generic OBD II functions from a proprietary menu (1996 and newer vehicles only).

To perform a scan tool test

1. **Launch the scan tool**. Tap **Vehicle manufacturers** on the Home screen.
2. **Identify the vehicle**. Identify the test vehicle by selecting from the menu options.
3. **Select the system**. Select the system to be tested from the systems menu.
4. **Connect the data cable to the vehicle**. Follow the on-screen connection instructions to connect the scan tool unit to the test vehicle.
5. **Select the test from the scan tool main menu**. Select the desired test.

5.3.1 Service Codes

This selection may appear as Codes, Codes Menu, Codes Only, Codes (No Data), Service Codes or something similar on the menu. Selecting opens a list of data parameter viewing options that include:

- Display Codes
- Clear Codes
- Freeze Frame/Failure Records
- DTC Status

Display Codes

Selecting either opens a list of diagnostic trouble codes (DTCs) stored in the electronic control module (ECM), or a submenu of DTC viewing options. Submenu options include:

- **Trouble Code Information** opens a list of codes in ECM memory
- **History Codes** opens a list codes whose symptoms are not currently present. History codes indicate an intermittently occurring problem.
- **Failed This Ignition** opens a list of codes that set during the current ignition cycle.
- **MIL SVS or Message Requested** displays ECM requests to light the malfunction indicator lamp (MIL) or service vehicle soon (SVS) lamp, or display a driver information alert.
- **Last Test Failed** displays a list of all failed tests.
- **Test Failed Since Code Cleared** displays a list failed tests that failed since the last time codes were cleared from ECM memory.

A code list includes the DTC and a description (Figure 5-6).

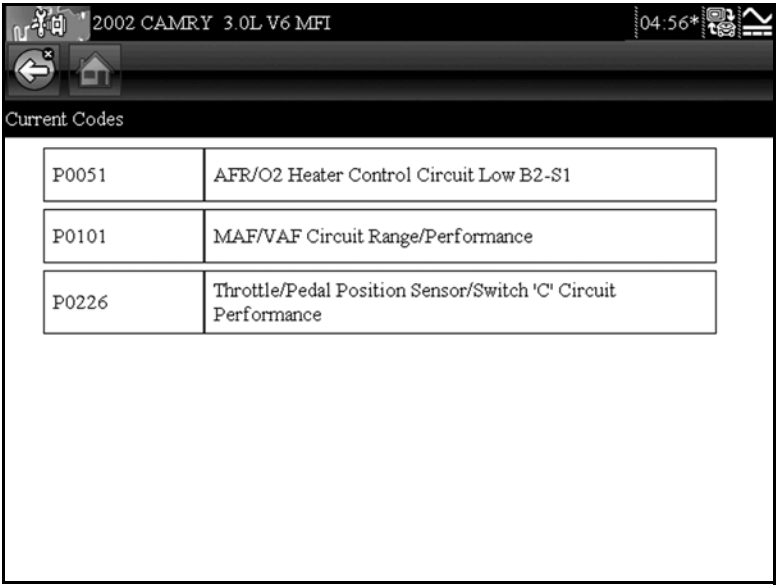


Figure 5-6 *Sample code list*

Clear Codes

The scan tool clears trouble codes from the control module memory on some vehicles. If this function is not available on the test vehicle, Clear Codes does not appear on the menu.

To clear codes:

1. Select **Clear Codes** from the Codes Menu.

   A confirmation message displays.

2. Make sure any conditions shown on the confirmation message are met, then select **Yes**.

   A codes cleared message displays once the operation is complete.

3. Select **Continue** to return to the Codes Menu.

Freeze Frame/Failure Records

This selection displays the DTC that was set, along with corresponding data, when the ECM commanded the malfunction indicator lamp (MIL) to turn on.

Freeze Frame/Failure Records is an OBD-II/EOBD function, see (\$02) Display Freeze Frame Data on page 56 for additional information.

5.3.2 Data Display

This selection may appear as Data, Data (No Codes), Data Display, Data Menu, or something similar on the menu. Select **Data** to view live datastream parameters from the vehicle ECM.

In data display mode parameters transmitted from the vehicle ECM display in the main body of the screen. A toolbar, which is used to configure and control the parameter data, displays at the top of the screen (Figure 5-7).

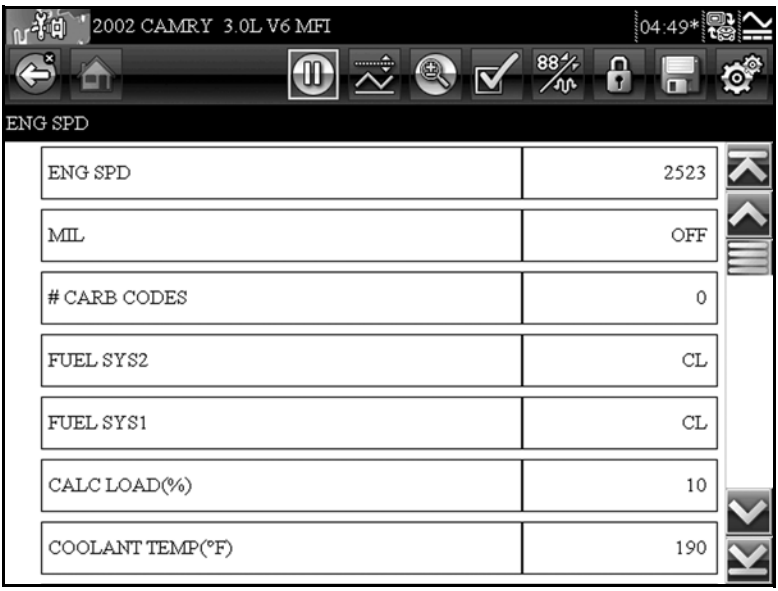


Figure 5-7 *Sample data display screen*

Toolbar

The buttons on the toolbar operate as shown in Table 4-1 on page 25 while viewing data.

Main Body

During data display the main body of the display is divided into two columns; the left-hand column displays a description of the parameter and the right-hand column shows the parameter value or state. Parameters are listed in the order in which they are transmitted by the ECM, so there will be variation between makes and models. Three parameters can be locked, or fixed, at the top of the list, so they do not change as you scroll through the parameter list in the lower frame. Use the **Lock/Unlock** button on the toolbar to select which parameters are fixed (see Locking Parameters on page 44).

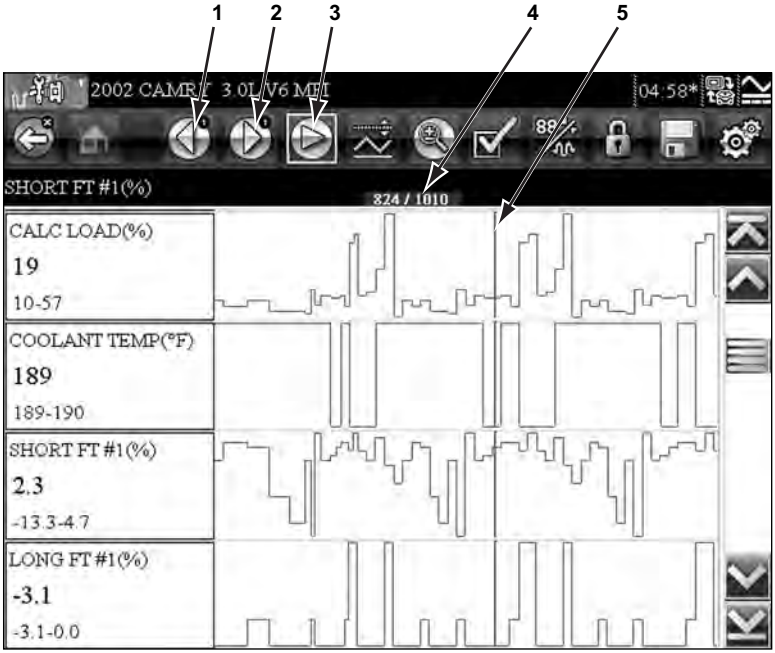
Pausing Data Collection

You may pause the collection of data from the vehicle control module. When data is paused, a number of previous frames of vehicle data, before was pause was selected, are stored in tool memory, and are available for review. If pause is selected while viewing data in text mode the screen automatically changes to display data graphs.

To pause data collection:

1. Tap the **Pause** button while viewing data (Figure 5-8).

   On the toolbar, the Pause button replaces the Record button and the Previous Frame and Next Frame buttons display. A frame counter displays in main screen.



1— Previous Frame button

2— Next Frame button

3— Play button

4— Frame counter (current frame/total frames)

5— Position indicator

Figure 5-8 *Sample paused frame of data*

2. Scroll to review the data in the frame.
3. To switch frames, touch **Previous Frame** or **Next Frame**. Each button touch moves one frame in the selected direction.

To resume collecting data:

- Touch the **Record** button.

  The display changes to live data and the **Pause** icon is shown on the toolbar. The display also returns to text mode if that was the mode being used before data collection was paused.

NOTE:

The **Shortcut** button can be set to perform the Pause/Play function. See Configure Shortcut Key on page 65 for additional information.

Customizing the Data List

The **Custom Data List** button on the toolbar is used to determine which specific parameters display. Minimizing the number of parameters on the data list allows you to focus on any suspicious or symptomatic data parameters. Most parameters can be removed from the list. Certain vital parameters, such as RPM, cannot be removed. These appear in gray at the top of the list along with a lock icon and cannot be selected.

IMPORTANT:

Limiting the number of parameters that display results in a faster data refresh rate, and reduces the amount of memory used for saved files.

To create a custom data list:

1. Tap to select the **Custom Data List** button on the toolbar.

   The data selection screen displays and two new buttons appear on the toolbar.

   The toolbar buttons provide options for selecting and deselecting which parameters to include or remove from the custom data list:

Button	Description
	**Select/Deselect**, use to mark individual parameters to hide or display.
	**Select All/Deselect All**, use to hide or display all of the parameters in the list. Any locked parameters cannot be hidden.

Check marks to the left of the parameter description indicates which parameters are selected for display. A second smaller check box indicates a locked parameter.

2. Create a custom data list by touching the parameters to include. A parameter that displays is highlighted, a parameter that does not display is not. Select which parameters to display:
   a. Touching the **Select All/Deselect All** button immediately changes all of the parameters to the same condition, a second touch switches them back.
   b. Touching the **Select/Deselect** button activates it. Now you can add or remove parameters by touching individual entries in the list.

   Keep the following in mind:
   - Item at the top of the list that cannot be highlighted are locked and cannot be turned off.
   - Drag the screen to scroll and view the entire list.
   - Use the Select All button to display the complete list.
   - Use the Deselect All button to remove all of the highlights.
   - Use the Cancel button to return to the data display.
3. Select **OK** to display the updated data list.

Changing Screen Views

Selecting the **View** button opens a dropdown menu of options:

- PID List
- 1 Graph
- 2 Graph
- 4 Graph

The PID (parameter identification) List view is a 2-column display with the name of the parameters in the left column and their current values in the right column (Figure 5-7).

The 1, 2, and 4 Graph views divide the screen horizontally to simultaneously display data graphs of the indicated number of parameters in the main body of the screen (Figure 5-9).

Use the scroll bar or the **up (▲)** and **down (▼)** keys to view other parameters.

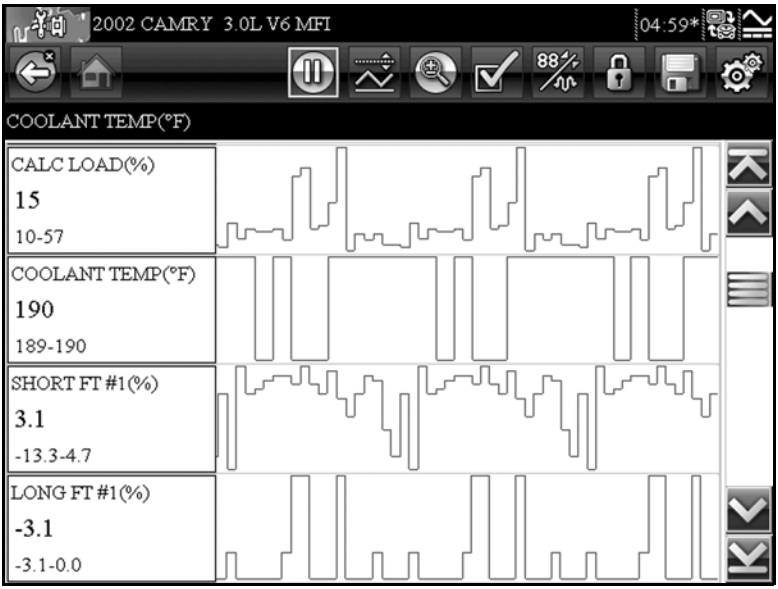


Figure 5-9 *Sample Graph view screen*

Any previously set conditions, such as held data or locked lines of data, remain in effect when the screen view is changed.

Locking Parameters

Use the **Lock/Unlock** button to lock selected lines of the data in place and prevent them from scrolling, or to release previously locked lines of data. Up to three lines of data may be held at a time, the bottom line of the display cannot be locked. This feature allows you to position related parameters together, making it easier to monitor their values and spot inconsistencies.

When viewing in text mode, locked data lines move to the upper frame on the main body of the display screen. When viewing in graph mode, a lock icon appears alongside the parameter name to indicate it is locked.

To lock parameters:

1. Tap the **Lock/Unlock** button on the toolbar.

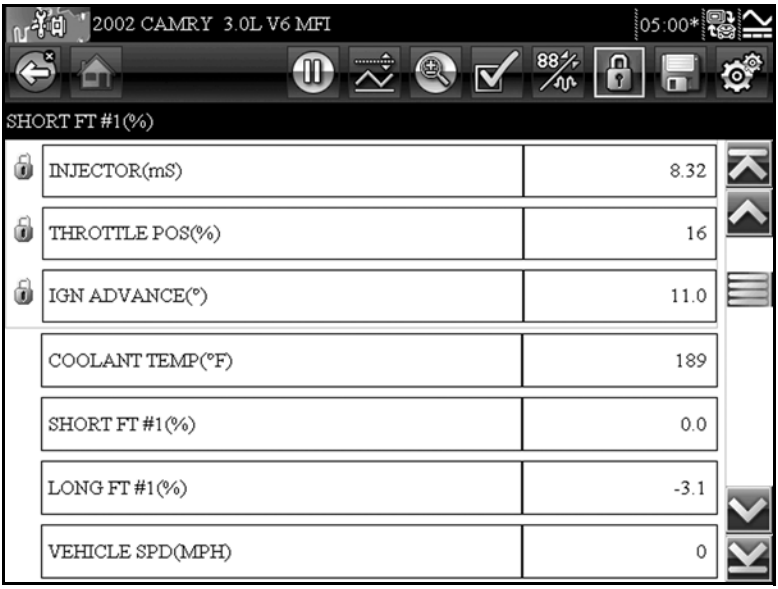


Figure 5-10 *Sample locked parameters*

The display is now in lock mode, and it remains in this mode until another button is selected.

2. Tap anywhere within a parameter frame to lock it.

   The parameter is highlighted, a lock icon displays alongside it to indicate that it is locked and the parameter displays in the upper frame on the screen.

3. Select additional parameters to lock.

NOTE:
If three parameters are locked, one of them must first be unlocked before another parameter can be locked.

4. Select any toolbar button to exit lock mode.

   Locked parameters remain locked after exiting lock mode, they must be unlocked to release them.

To unlock parameters:

1. Tap the **Lock/Unlock** button on the toolbar.
2. Highlight the parameter to be unlocked.

   The lock icon disappears and the parameter can be scrolled as before.
3. Select any toolbar button to exit lock mode.

Saving

The **Save** button is used to record movies of vehicle datastream values into tool memory. Saving helps when trying to isolate an intermittent problem or to verify a repair during a road test. Saved files also provide documentation that helps you explain driveability problems to your customers.

A number of data movies can be stored, which can later be opened by selecting the Tool button, or by selecting Tools on the main menu.

To save a movie:

- Select **Save**.

  A save movie dialog box displays while data is being saved. The movie is saved when the message box disappears.

The **Shortcut** button can be programmed to perform the Save Screen or Save Movie function. See Configure Shortcut Key on page 65 for details.

Saved files can also be downloaded from the scan tool to a personal computer through the Mini USB port.

5.3.3 Setting Trigger Levels

The PID Trigger button on the toolbar allows you to configure the scan tool to automatically capture data when a parameter value crosses a threshold value. When triggering is armed, a “trigger event” pauses data collection and records a data movie, similar to an OBD-II/EOBD freeze-frame event.

Selecting the **PID Trigger** opens a menu that includes:

- **Set Trigger**—establishes upper and lower signal values to initiate an event capture for the highlighted parameter.
- **Arm Trigger**—activates the scan tool to capture an event when the signal crosses a threshold.
- **Clear All Triggers**—deletes all previously set trigger levels.

If triggers are set the menu options are:

- **Clear Trigger**—deletes set trigger levels for the highlighted parameter.
- **Disarm Trigger**—de-activates event capture capability.
- **Clear All Triggers**—deletes all previously set trigger levels.

To set trigger levels:

1. Highlight the parameter to be used to trigger the recording.
2. Tap the **PID Trigger** button.
3. Select **Set Trigger** from the dropdown menu.

   A graph of the highlighted parameter with a trigger toolbar above it fills the main body of the screen. The trigger level line displays as a solid line running horizontally across the data graph (Figure 5-11). An upper and lower trigger level must be set, the upper level is set first.
4. Tap the plus (+) and minus (–) buttons on the toolbar, or use the up ▲ and down ▼ arrow keys to position the upper trigger level to where you want it on the graph.
5. Tap the ✓ on the toolbar, or press the ✓ key, to set the upper threshold.

   A lower trigger level line now appears at the mid-point of the graph.
6. Tap the plus (+) and minus (–) buttons on the toolbar, or use the up ▲ and down ▼ arrow keys to position the lower trigger level line to where you want it on the graph.

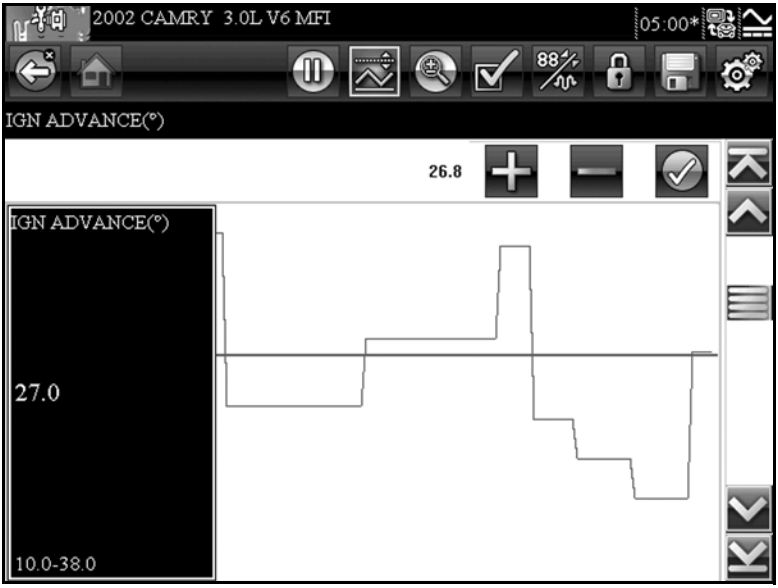


Figure 5-11 *Sample trigger set screen*

7. Tap the ✓ on the toolbar, or press the ✓ key, to set the lower threshold.
8. Set the lower trigger level using the up ▲ and down ▼ arrows and press ✓.

The display returns to the live data view and the trigger points appear as horizontal lines across the designated parameter graphs. Repeat this procedure to establish trigger points for other parameters if desired. Once armed, any data points that register outside of your set conditions pause data collection and save a recording.

NOTE:
Only three parameters can have trigger levels set at one time, but only one of the conditions needs to be satisfied for triggering to occur.

To arm triggers:

1. Tap the **PID Trigger** button on the toolbar.
2. Select **Arm Triggers** from the dropdown menu.

The trigger lines on the data graphs change color to indicate an armed condition.

Triggers for all of the graphs are armed simultaneously. Once triggering is armed, it remains in that state until you switch it off. If trigger settings are modified or are added for other parameters, they are armed as soon as you exit the setting screen.

5.3.4 Functional Tests

The **Functional Tests** selection is used to access vehicle-specific subsystem and component tests. Available tests vary by manufacturer, year, and model, and only the available tests display in the menu.

There are four general types of functional test operations:

- **Information Tests** are read-only tests, like selecting VIN from a Functional Tests menu to display the VIN of the identified vehicle.
- **Toggle Tests** switch a component, such as a solenoid, relay, or switch, between two operating states.
- **Variable Control Tests** command a certain value for a system or component, such as varying the spark timing in 1° increments or the EGR valve duty cycle in 10% increments.
- **Reset Tests** reset the adaptive, or learned, values that are stored in the control module.

Selecting Functional Tests opens a menu of test options that varies by make and model. Selecting a menu option either activates the test or opens a submenu of additional choices. Follow all screen instructions while performing tests. How and what information is presented on the screen varies according to the type of test being performed.

Some toggle and variable control tests display special functional test controls at the top of the screen.

Functional test control buttons allow you manipulate the test signal as shown in Table 5-1.

Table 5-1 *Functional test control buttons*

Name	Button	Description
OK		Activates the test.
Cancel		Cancels the test.
Minus		Switches an item off or low, or incrementally reduces a variable signal.
Plus		Switches an item high or on, or incrementally increases a variable signal.

5.4 Exiting Scan Tool Tests

The scan tool remains open as long as there is an active communication link with the vehicle. You must disconnect this communication link in order to exit from scan tool tests. A warning message displays if you attempt to shut down with the scan tool communicating.

NOTE:
Damage to the vehicle electronic control module (ECM) may occur if communication is disrupted. Make sure the data cable and the USB cable are properly connected at all times during testing. Exit all tests before disconnecting the test cable or powering down the tool.

To exit scan tool tests:

1. From an active screen, select **Exit** from the toolbar to return to the Systems Menu.
2. From the Systems Menu, select **Back**.

A stopping communications message briefly displays followed by the Main menu.

Now, the scan tool is no longer communicating with the vehicle and it is safe to shut down or test another vehicle.

Chapter 6 OBD-II/EOBD

OBD-II/EOBD allows you to access Generic OBD-II scan tool tests without completing a vehicle identification. This option presents a quick way to check for diagnostic trouble codes (DTCs), isolate the cause of an illuminated malfunction indicator lamp (MIL), check monitor status prior to emissions certification testing, verify repairs, and perform a number of other services that are emissions-related. OBD-II/EOBD is also used for testing OBD-II compliant vehicles that are not included in the scan tool databases.

Keep in mind, this function provides generic OBD-II information only. Select from the Vehicle Manufacturers Menu for enhanced OBD-II functions.

Selecting OBD-II/EOBD on the Home screen opens a menu with two options:

- **OBD Diagnose** opens the OBD-II/EOBD main menu to begin a diagnostic test session.
- **OBD training Mode** similar to demonstration mode, this option allows you to perform simulated OBD tests without being connected to a test vehicle.

6.1 OBD Diagnose

Selecting OBD Diagnose opens a menu with these options:

- **Start Communication** begins the test session
- **Select Communication Protocol** allows you to select which protocol to use
- **Connector Information** provides data link connector (DLC) location details for most models

6.1.1 Start Communication

Use the following procedure to conduct an OBD-II/EOBD test session:

To perform an OBD-II/EOBD Test:

1. Tap **Start Communications** on the OBD-II/EOBD menu.

   A generic connection message displays (Figure 6-1), connect the scan tool to the test vehicle as instructed.

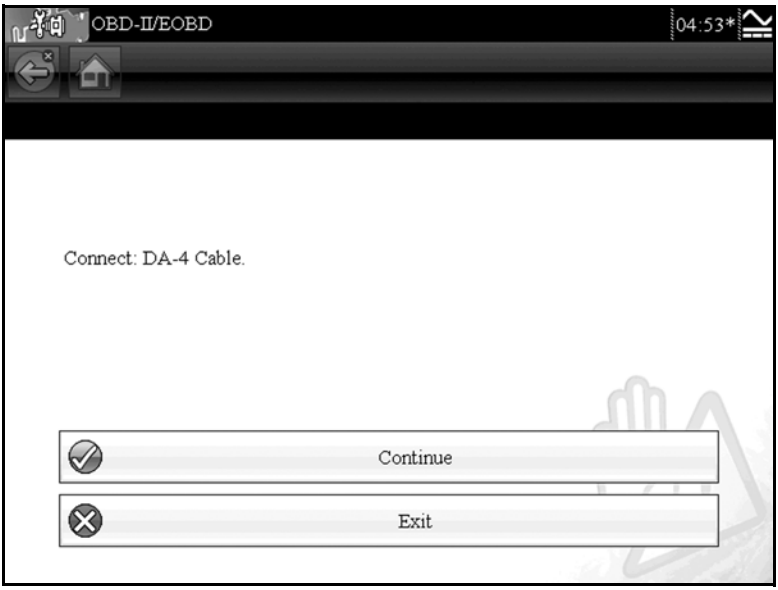


Figure 6-1 *Sample generic connection message*

2. Select **Continue**.

   A communications message that shows how many ECMs were detected, Which ECM is communicating, and which communication protocol is being used displays (Figure 6-2).

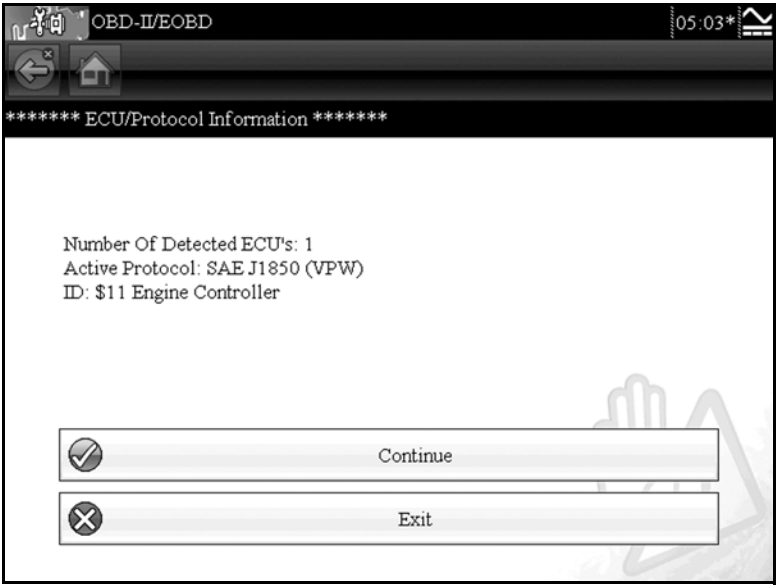


Figure 6-2 *Sample communication message*

3. Select **Continue**.

   A menu of available tests displays, options include (Figure 6-3):

   - Readiness Monitors
   - MIL Status
   - Display Current Data ($01)
   - Clear Emissions Related Data ($4)
   - Display Freeze Frame Data ($02)
   - Display Trouble Codes ($03)
   - Display Test Parameter/Results ($05, 06, 07)
   - Request Control of On-Board System ($8)
   - Read Vehicle Identification ($09)

4. Select a test to continue.

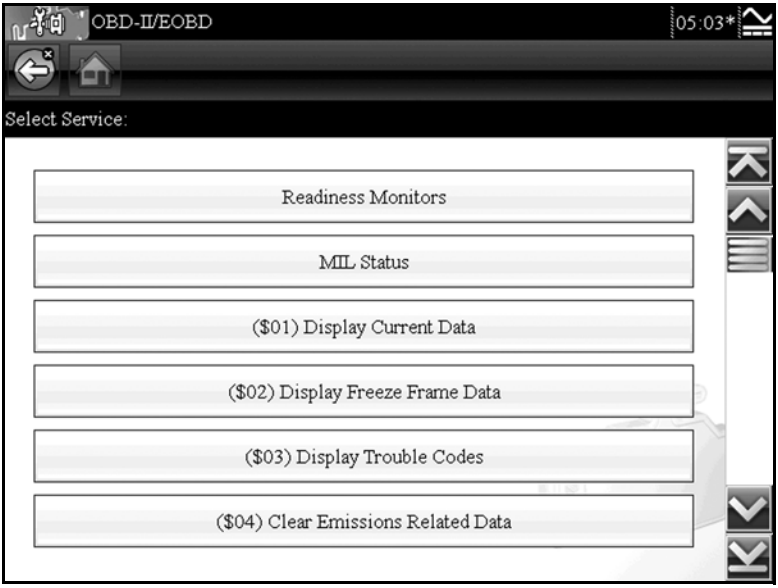


Figure 6-3 *Sample Start Communication menu*

Readiness Monitors

Use this menu item to check the readiness of the monitoring system. If a monitor system is not supported, it is not displayed. Scroll, if needed, to view the entire list of monitors. Selecting Readiness Monitors opens a submenu with two choices:

- **Monitors Complete Since DTC Cleared** displays the results of all monitor tests that have run since the last time the ECM memory was cleared.
- **Monitors Complete This Cycle** displays only the results of monitor tests that ran during the current drive cycle, they reset when the ignition is switched off.

MIL Status

This item is used to check the current condition of the Malfunction Indicator (MIL). Additional information, such as which ECM commanded the MIL on and the distance driven

while the MIL is on (if supported), can also be displayed. It is also possible to save the MIL Status report.

($01) Display Current Data

Use this item to display the current emission related data from the selected electronic control module (ECM) of the vehicle. Displayed data includes analog inputs and outputs, digital inputs and outputs, and system status information broadcast on the vehicle data stream.

($02) Display Freeze Frame Data

This item is used to display freeze fame data for any stored emission related diagnostic trouble codes (DTCs). In most cases the stored frame is the last DTC that occurred. Certain DTCs, those that have a greater impact on vehicle emission, have a higher priority. In these cases, the highest priority DTC is the one for which the freeze frame records are retained in memory.

Freeze frame data includes a snapshot of critical parameter values at the time the DTC set.

($03) Display Trouble Codes

This is used to display any stored emission related DTCs reported by the various ECMs.

($04) Clear Emissions Related Data

This item is used to clear all emission related diagnostic data such as, DTCs, freeze frame data, and test results from the memory of the selected ECM.

($05, 06, 07) Display Test param./ Results

This selection opens a submenu of test parameters and test results form various sensors, such as the oxygen sensor (O2S), monitor test results, and a record of DTCs detected during the last drive cycle. The menu includes:

- Oxygen Sensor Monitoring ($05)
- Specific Monitored Systems ($06)
- DTCs Detected During Last Drive ($07)

($08) Request Control of On-board System

This service enables bidirectional control of the ECM, that is the scan tool transmits control commands to operate the vehicle system. This function is useful in determining how well the ECM responds to a command.

Available options vary by make, model, and year of the test vehicle. Select a test and follow the on-screen instructions.

($09) Read Vehicle Identification

This selection displays the vehicle identification number (VIN), the calibration identification, and the calibration verification number (CVN) of the test vehicle.

($09) In-use Performance Tracking

This selection displays the In-use Performance Tracking of monitored data. It is basically a record of the number of times each of the monitor tests have been completed.

6.1.2 Select Communication Protocol

A communication protocol is a standardized way of data communication between an ECM and a scan tool. Global OBD may use the following communication protocols:

- ISO 9141-2 (K-LINE)
- SAE J1850 PWM (Pulse Width Modulation)
- SAE J1850 VPW (Variable Pulse Width)
- ISO 14230-4 (Keyword Protocol 2000)
- SAE J2284/ISO 15765-4 (CAN)

Touch **Select Communication Protocol** to open a menu of options (Figure 6-4).

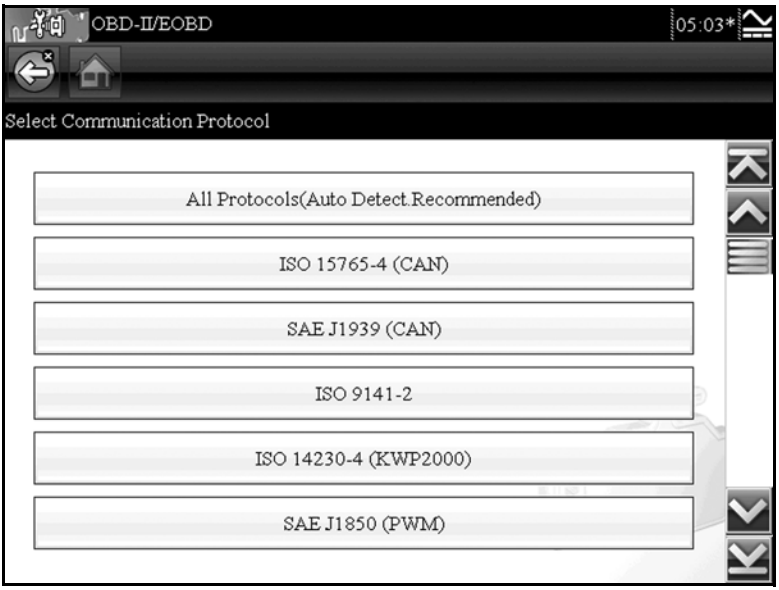


Figure 6-4 *Sample communication protocol menu*

When the All Protocols setting is used the scan tool attempts to establish communication using each protocol on order to determine which one the vehicle is broadcasting on.

6.1.3 Connector Information

This option opens a database of vehicle diagnostic connector locations that includes most makes and models. The menu driven interface leads you quickly to the difficult to find test connector.

Chapter 7 Previous Vehicles and Data

The Previous Vehicle and Data Home screen selection allows you to quickly configure the scan tool to the identity of the last twenty vehicles tested, and to access saved data files. A menu with three options opens when **Previous Vehicle and Data** is selected (Figure 7-1).

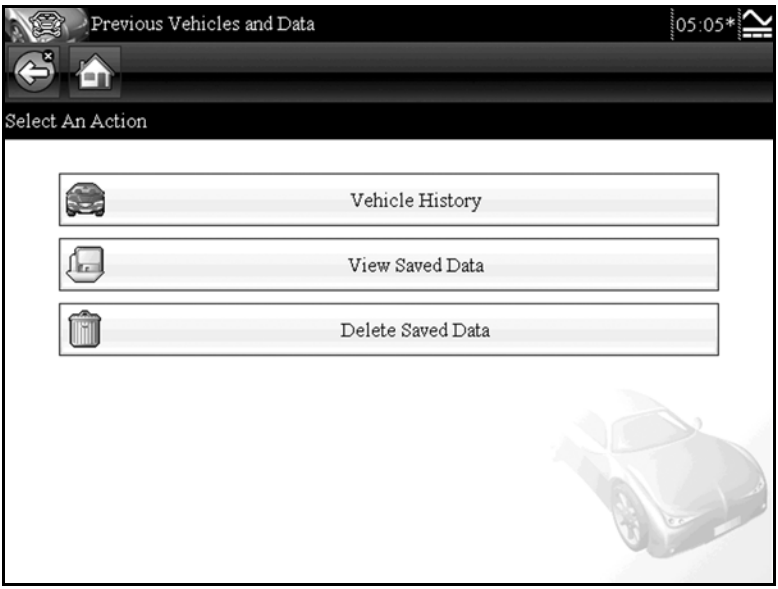


Figure 7-1 *Sample previous vehicles and data menu*

7.1 Vehicle History

The scan tool stores the identifying characteristics of the last twenty vehicles tested, so there is no need to go through the complete vehicle identification sequence when performing a retest after repairs have been made. The oldest vehicle

record is deleted when a new vehicle is identified once there are twenty identifies on file.

To select from a vehicle in history:

1. Tap **Previous Vehicles and Data** on the Home screen.
2. Select **Vehicle History** from the menu.

   A list of up to 20 previously tested vehicles displays, file names include the vehicle ID, date, and time. Use the scroll bar to view the entire list.
3. With the item to be opened highlighted, either tap the vehicle ID or press the ✓ key.

   The appropriate software loads and a vehicle ID confirmation screen displays.
4. Select **OK** or press ✓ to continue.

   A connection message displays.
5. Connect the data cable to the vehicle, then select **OK** or press ✓ to continue.

   The menu for the last system tested on the selected vehicle displays.

7.2 View Saved Data

Selecting the **View Saved Data** menu option opens a list of all the data movies and screen images that are stored in the scan tool memory.

Saved files can either be opened directly on the scan tool, or downloaded to a personal computer and opened using ShopStream Connect software.

Saved files are listed in chronological order by the date and time that they were created, with the most recent files are at the top of the list. The vehicle ID characteristics are included in the listings as well (Figure 7-2).

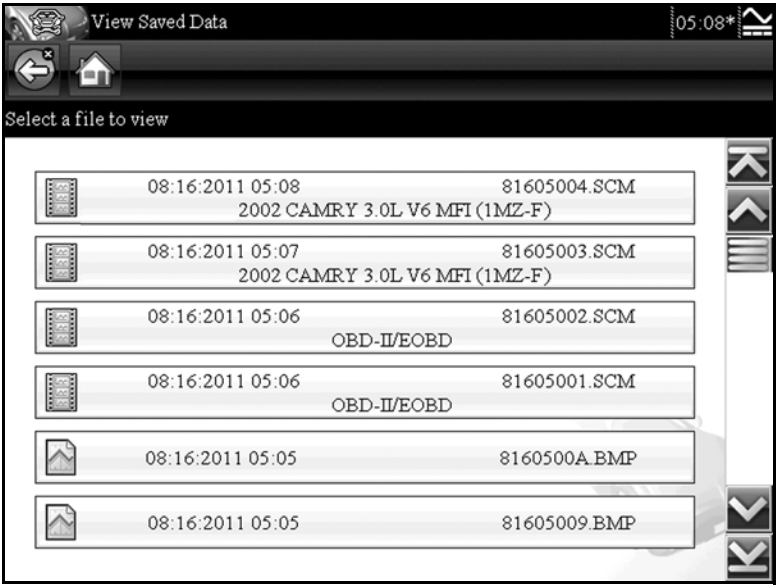


Figure 7-2 *Sample saved vehicle data list*

To review a movie:

1. Tap **Previous Vehicles and Data** on the Home screen.
2. Select **View Saved Data** from the menu.
3. Select a movie from the list of saved files.

   The movie opens and plays in real time. The **Play** button changes to the **Pause** button at the end of the movie.

Movie reviewing tips:

- The **Pause/Play** and **View** toolbar buttons are active while a movie is playing, so you can stop the movie or switch to graph view at any time.
- The **Previous Frame** and **Next Frame** buttons are active if the data is paused.

7.3 Delete Saved Data

This menu option is used to permanently erase saved files from scan tool memory when they are no longer needed.

To delete a saved file:

1. Select **Previous Vehicles and Data** from the Home screen.
2. Select **Delete Saved Data** from the menu.

   A list of saved files displays.

NOTE:
The Select/Deselect and Select All/Deselect All buttons are available on the toolbar. Use the Select/Deselect button to delete individual files, use the Select All/Deselect All buttons to clear the entire memory buffer at once.

3. Select a file to delete from the list and a confirmation message displays.
4. Select an option from the confirmation message:
   - **OK** removes the selected file and returns to display the saved files list, which no longer includes the deleted file.
   - **Cancel** returns to the saved files list without deleting the selected file.
5. Select **Back** on the toolbar to return to the Previous Vehicles and Data menu, select **Home** to return to the Home screen.

Chapter 8 Tools

The Tools option on the Home screen is used to configure the scan tool for your personal preferences. Tap the **Tools** button to open a menu of options.

8.1 Tools Menu

The Tools menu has the following options:

- **Connect To PC**, use to transfer and share file with a personal computer (PC)
- **Configure Shortcut Key**, use to change the functionality of the shortcut button
- **System Information**, use to display configuration information for your scan tool
- **Settings**, use to configure certain characteristics of the scan tool

8.1.1 Connect to PC

The **Connect to PC** selection is used with the optional ShopStream Connect™ software, which lets you view data files on a personal computer, transfer files between the scan tool and PC, and download software updates from the PC to the scan tool. ShopStream Connect is a free software program that can be downloaded from the Internet at *software.snapon.com*.

A USB cable (supplied) is used to link the scan tool to the PC. A communications icon appears on the right edge of the title bar when the scan tool is properly connected to the PC.

To use Connect to PC:

1. Select **Tools** from the Home screen to open the menu.
2. Select **Connect to PC** from the menu.
3. Follow the instructions on the scan tool screen to complete the operation.

8.1.2 Configure Shortcut Key

This feature allows you to change the functionality of the **Shortcut** key. Possible function assignments include:

- **Brightness** increases the screen backlighting in incremental steps from lowest to highest, then returns to the lowest setting and continuously repeats.
- **Save Screen** takes a snapshot of the current screen as either a bitmap or jpeg image, it includes the visible screen image only.
- **Save Movie** saves a recording of a number of frames of data (buffered data plus data transmitted after triggering) for each available parameter.
- **Show Menu Shortcuts** opens the Configure Shortcuts menu when the Shortcut button is pressed so you can quickly select from any of the available functions.
- **Toggle Record/Pause** programs the Shortcut key to work as the Pause and Play buttons while viewing data, the first press pauses data collection and the second press resumes live data capture.

To assign a function to the Shortcut key:

1. Select **Tools** from the Home screen.

   The Tools menu opens.
2. Select **Configure Shortcut Key** from the menu.
3. Select a function from the menu.
4. Select the **Back** button on the toolbar to return to the options menu, or select the **Home** button to return to the Home screen.

8.1.3 System Information

The **System Information** option lets you view configuration information for your scan tool.

To display the System information screen:

1. Select **Tools** from the Home screen to open the menu.
2. Select **System Information** from the menu.
   The System Information screen displays.

Figure 8-1 *Sample system information screen*

3. Select the **Back** on the toolbar to return to the options menu, or select the **Home** to return to the Home screen.

8.1.4 Settings

Three choices are available on the Settings menu:

- System Settings on page 67
- Configure Scanner on page 73
- Configure Units on page 74

System Settings

Use System Settings to configure the scan tool to your personal preferences. Selecting opens a menu with three options; Battery Type, Display, and Date & Time. **Battery Type**, on page 68, adjusts internal tool operation for the kind of batteries being used. The Display, and Date & Time options open additional menus.

Display options include:

- **Brightness**, on page 68, is used to adjust the intensity of the screen back lighting.
- **Color Theme**, on page 69, is used to switch the display to a black screen background for improved visibility under poor lighting conditions.
- **High Contrast Toolbar**, on page 69, is used to switch the display to black and white toolbar for improved visibility under poor lighting conditions.
- **Font Type**, on page 70, is used to switch the display to bold-faced type for improved visibility under poor lighting conditions.
- **Backlight Time**, on page 70, is used to configure how long the screen remains illuminated when the tool is idle.
- **Touch Calibration**, on page 70, is used to calibrate the touch screen display.

Date & Time options include:

- **Time Zone**, on page 71, is used to set the internal clock to the local time standard.
- **Clock Settings**, on page 72, is used to set the real-time clock that displays on the title bar.
- **Daylight Savings Time**, on page 73, adjusts the clock for Daylight Savings Time.
- **Time Format**, on page 73, configures time to display on a 12 or 24 hour clock.
- **Date Format**, on page 73, is used to configure the month, date, and year displays.

Battery Type

This selection allows you to configure the tool to operate on either standard or rechargeable batteries (Figure 8-2). The rechargable setting is designed to maximize battery life. An on-screen message displays in the rechargeable mode when the batteries are in need of a charge.

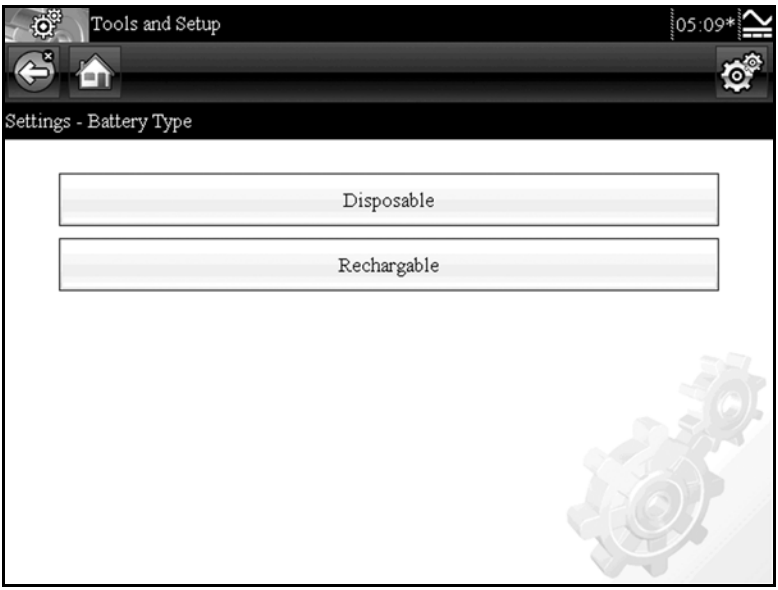


Figure 8-2 *Sample battery type screen*

Brightness

Selecting this option opens the brightness setting screen, which allows you to adjust the back lighting (Figure 8-2).

Each tap of the **Plus** and **Minus** buttons, or the up (▲) and down (▼) arrows, on the display screen incrementally changes the back lighting up or down respectively.

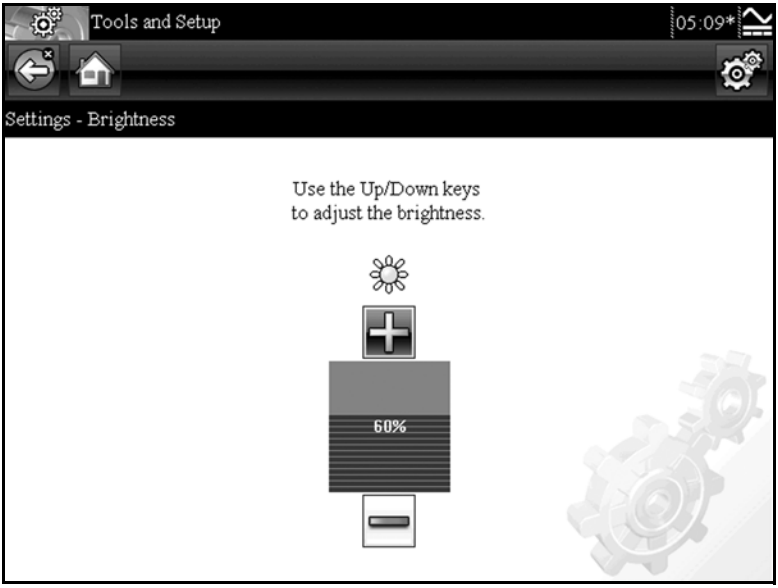


Figure 8-3 *Sample brightness setting screen*

Select **Back** or **Home** from the toolbar, select the ✓ (OK) button on the screen, or press the **X** (cancel) key to exit.

Color Theme

This option allows you to select between a white and black background for the screen. The black background can be beneficial when working under poor lighting conditions.

Selecting opens a menu with two choices:

- **Day Theme** (white background)
- **Night Theme** (black background)

Make a selection and a “please wait” message momentarily displays followed by the Home screen. The new toolbar setting is now active.

High Contrast Toolbar

This option allows you to select between a standard and high-contrast toolbar. The high-contrast option has black and

white buttons with crisp graphics that are easier to see in poor lighting conditions or bright sunlight.

Selecting opens a menu with two choices. Make a selection and a “please wait” message momentarily displays followed by the Home screen. The new toolbar setting is now active.

Font Type

This option allows you to select between standard and bold faced type for the display screen. Bold type is designed to make screen text more legible under poor lighting or bright sunlight conditions.

Selecting opens a menu with two choices: Normal Font and Bold Font. Highlight the desired choice and Press **Y/✓**, the change is instantaneous. Select the Back or Home button from the tool bar to return to either the Settings menu or the Home screen.

Backlight Time

This option allows you to configure how long the screen backlight remains on when the tool is inactive. The following choices are available:

- Always On
- 15 Seconds
- 30 Seconds
- 45 Seconds
- 60 Seconds

Scroll and Press **Y/✓** to make a selection. Then, select the Back or Home button from the tool bar to return to either the Settings menu or the Home screen.

Touch Calibration

Calibrating the touch screen maintains the accuracy of the touch-sensitive display screen. Calibrate the screen on a routine basis to keep your scan tool in good working order.

To calibrate the touch screen:

1. Select **Tools** from the Home screen to open the menu.
2. Select **Settings** from the menu.
3. Select **System Settings** from the menu.
4. Select **Display** from the menu.
5. Select **Calibrate Touch Screen** from the menu.
   The calibration screen opens (Figure 8-4)

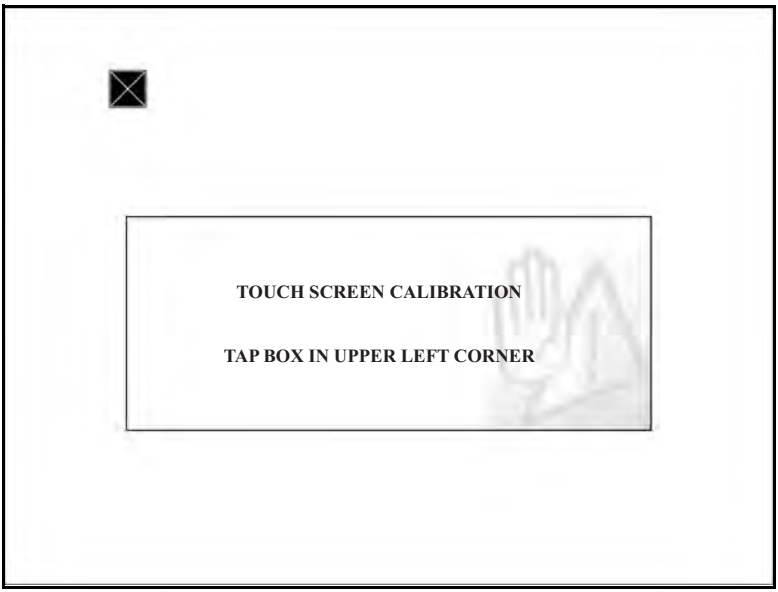


Figure 8-4 *Sample calibration screen*

6. Touch each box on the screen as it displays.
   The display returns to the Settings menu once the screen calibration procedure is complete.

Time Zone

This option opens a menu of time zone settings. Scroll to highlight, then select the local time zone. The display returns to the Settings menu once a time zone is selected.

Clock Settings

The clock setting screen opens when this option is selected from the Setup menu ().

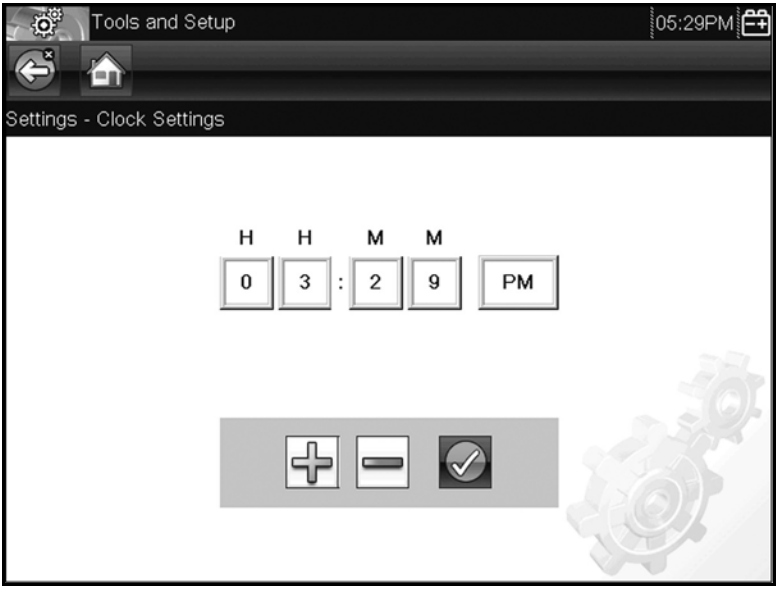


Figure 8-5 *Sample clock setting screen*

To set the clock:

1. Select **Tools** from the Home screen.
2. Select **Settings** from the menu.
3. Select **System Settings** from the menu.
4. Select **Date & Time** from the menu.
5. Select **Clock Settings** from the menu.
6. Use the **Plus** and **Minus** buttons on the display screen to change the value in the highlighted field. Each tap of a button changes the value up or down one increment.
7. Tap the ✓ button to move the highlight to the next field.
8. Repeat Step 1 until the correct time is displayed.
9. After the clock is set, select **Back** or **Home** from the toolbar, or press the **X** (cancel) key to exit.

Daylight Savings Time

This option configures the internal clock for Daylight Savings Time. Select Yes or No to return to the Settings menu.

Time Format

This option allows you to select whether time displays on a 12 or 24 hour clock. Select to return to the Settings menu.

Date Format

This option allows you to select how date information is displayed. Select from:

- Month, Day, Year (MM_DD_YYYY)
- Day, Month, Year (DD_MM_YYYY)
- Year, Month, Day (YYYY_MM_DD)

Scroll and select to return to the Settings menu.

Configure Scanner

This option determines whether or not the scales are displayed on the data graphs when using the Scanner. Scales are the graduations and values that display on the horizontal axis at the base of the parameter graphs. The waveform fills the entire graph area with scales switched off.

To switch scanner scales:

1. Select **Tools** from the Home screen.
2. Select **Settings** from the Tools and Setup menu.
3. Select **Configure Scanner** from the menu.
4. Highlight either menu entry to make a selection:
   - **Show Graph Scale**—to switch the scales on.
   - **Hide Graph Scale**—to switch the scales off.
5. Tap the **Back** button or press the **N/X** key to return to the Settings menu.

Configure Units

This option opens a dialog box for choosing between US customary or metric units of measure for temperature, air pressure, other pressures, and vehicle speed (Figure 8-6).

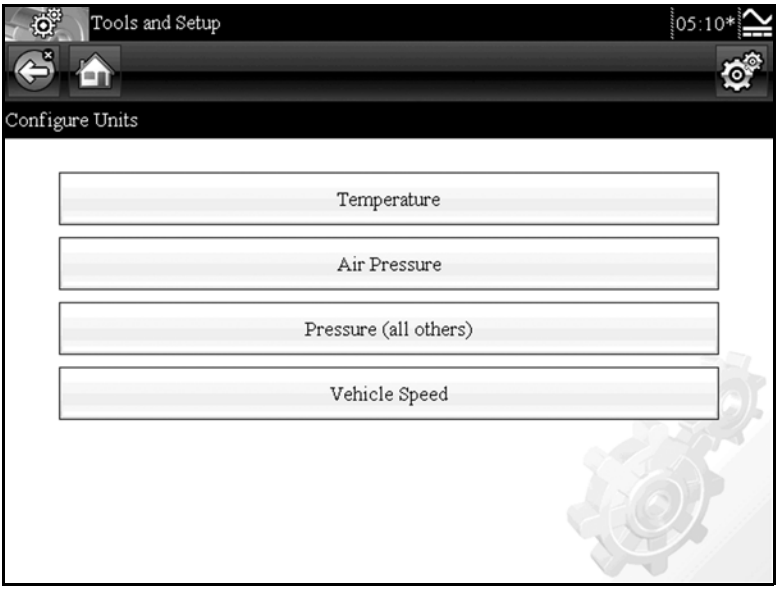


Figure 8-6 *Sample configure units menu*

To change the units setup:

1. Select **Tools** from the Home screen to open the menu.
2. Select **Configure Units** from the menu.

   A menu of options displays:
   - Temperature
   - Air Pressure
   - Pressure (all others)
   - Vehicle Speed
3. Select an item to open a list of choices.
4. Select a setting from the list.
5. Press **X** or tap the **Back** button on the toolbar to return to the options menu.

Chapter 9 Maintenance

This chapter covers how to care for your scan tool.

9.1 Cleaning and Inspecting

When using the scan tool perform the following tasks to keep it in top shape:

- Check the housing, wiring, and connectors for dirt and damage before and after each use.
- At the end of each work day, wipe the scan tool housing, wiring, and connectors clean with a damp cloth.

IMPORTANT:
Do not use any abrasive cleansers or automotive chemicals on the unit.

9.1.1 Cleaning the Touch Screen

The touch screen can be cleaned with a soft cloth and a mild window cleaner.

IMPORTANT:
Do not use any abrasive cleansers or automotive chemicals on the touch screen.

9.2 Battery Service

Follow all safety guidelines when handling the batteries.

⚠ WARNING

Risk of electric shock.

- **Prior to recycling the batteries, protect exposed terminals with insulating tape to prevent shorting.**
- **Disconnect all test leads and turn diagnostic tools off before removing the batteries.**
- **Do not attempt to disassemble the batteries or remove any component projecting from or protecting the battery terminals.**
- **Do not expose the unit or batteries to rain, snow, or wet conditions.**
- **Do not short circuit the battery terminals.**

Electric shock can cause injury.

9.2.1 Battery Safety Guidelines

Keep the following in mind when handling batteries:

- Do not short circuit battery terminals.
- Do not immerse the scan tool or batteries in water, or allow water to enter the unit or battery compartment.
- Do not crush, disassemble, or tamper with the batteries.
- Do not heat the batteries to over 100°C (212°F), or dispose of it in a fire.
- Do not expose the batteries to excessive physical shock or vibration.
- Keep batteries pack out of reach of children.
- Do not use a battery that appears to have suffered abuse or damage.
- Store batteries in a cool, dry, well ventilated area.

To prolong the life of your batteries, power off the unit when not in use.

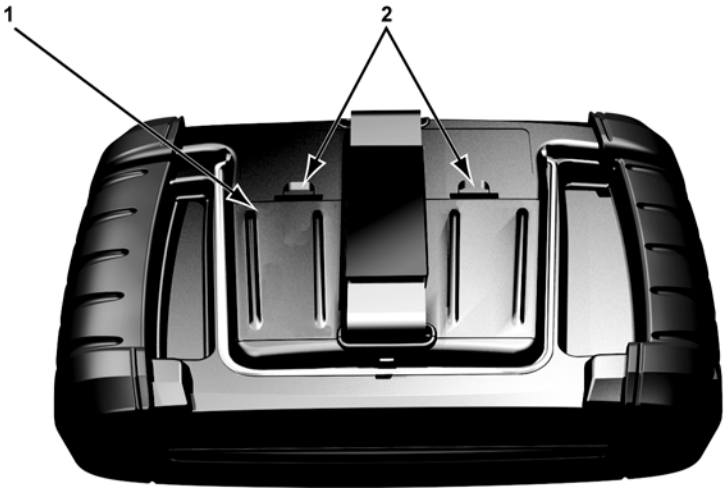
9.2.2 Replacing the Batteries

When replacing the scan tool batteries, use Alkaline or rechargeable nickel-metal hydride (NiMH) type AA batteries

only. Do not use standard (lead/zinc) batteries as they do not provide sufficient power to operate the scan tool, and may leak and damage the scan tool.

To replace the batteries:

1. Depress the two battery cover lock tabs and lift off the battery cover.



1— Battery Cover

2— Lock Tabs

Figure 9-1 *Battery replacement*

2. Remove the old batteries.
3. Observing proper polarity (shown on the battery slots), install six new AA batteries.

IMPORTANT:

Your scan tool can be damaged if the battery polarity is incorrect. Refer to the diagram in the battery compartment on the rear of the tool for correct battery polarity.

4. Fit the battery cover onto the housing.

NOTE:
If installing rechargeable batteries, be sure to reset the battery type on the Tools Setup menu. This helps prolong the life of the batteries, and notifies you when it is time to recharge them.

9.2.3 Disposing of the Batteries

Always dispose of batteries according to local regulations, which vary for different countries and regions. For additional information contact:

- North America; Rechargeable Battery Recycling Corporation (RBRC) at http://www.rbrc.org or http://www.call2recycle.org, or call 1(800) 822-8837 (USA)
- United Kingdom; Electrical Waste Recycling Company at http://www.electricalwaste.com

Products bearing the WEEE logo (Figure 9-2) are subject to European Union regulations.

Figure 9-2 *sample WEEE logo*

NOTE:
Always dispose of materials according to local regulations.

Contact your sales representative for details.