ETHOS® Edge

User Manual

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User Manual Information

This manual includes information and images applicable with diagnostic software version 18.4 and later. Some information within this manual may not be applicable with other diagnostic software versions.

The information in this manual is periodically revised to ensure the latest information is included. The current version of this manual and other technical documentation is available online from Snap-on Diagnostics.

Product Support Information

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Website Links:

Snap-on Diagnostics and Information

- **http://diagnostics.snapon.co.uk**

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- **https://www.snapon.com/diagnostics/uk/User-Manuals.htm**

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Product Training Videos

Diagnostic tool specific training videos are available on our website. Follow along and learn the basics of diagnostic tool operation with our free training videos.

Videos are product specific and are available at:

http://diagnostics.snapon.co.uk - Click on the "Training and Support" tab, select "Diagnostic Tools", then select the applicable diagnostic tool, and then select "See Quick Tips".

NOTE:
Sample titles are listed below. Not all titles may be available for all diagnostic tools, and are subject to change.

Snap-on® Training Solutions® - Training Videos (examples)	
Introduction and Navigation	Global OBD-II
Scanner Codes	Digital Multimeter
Scanner Data in PID View	Graphing Multimeter & Lab Scope
Scanner Data in Graphing View	Guided Component Tests
Fast-Track® Troubleshooter	Vehicle Specs & Resets
Functional Tests	SureTrack® & Wi-Fi

Diagnostic Quick Tips - Video Series

Snap-on Diagnostic Quick Tips videos are available at no charge on our website and on our YouTube channel. These videos are developed from real repair case studies to help professional technicians use diagnostic tools to solve specific vehicle problems (e.g. performing a Ford Relative Injector Flow Test).

Additional videos are also available showing specific diagnostic tool features (e.g. ShopStream Connect - Software Updates).

Figure 1-1

Videos are available at:

http://diagnostics.snapon.co.uk - Click on "Diagnostic Tools", then select the applicable diagnostic tool, then select "See Quick Tips"

https://www.youtube.com/user/snaponscanner/videos - Use the search function to find a title, or enter "Diagnostic Quick Tips" in the search field to see a list of all applicable titles.

NOTE:
URL links (above) and titles listed (below) are subject to change and may not be available in all markets.

A sample list of titles are listed below, other titles may be available.

Some videos may not applicable for use with all diagnostic tools.

Snap-on® Training Solutions® - Diagnostic Quick Tips Videos (examples)	
Air/Fuel Ratio Sensor Test	Fuel Injector Voltage and Current Tests (Scope)
Alternator Ripple Test (Scope)	Fuel Pump Current Ramp Test (Scope)
BMW® Rain Sensor Calibration	Harley-Davidson® ABS Brake Bleed
CAN Bus Diagnostics (Scope)	Harley-Davidson® Functional Tests
Chevrolet® Volt Coolant Pump Bleed	Harley-Davidson® Key Fob Programming

Snap-on® Training Solutions® - Diagnostic Quick Tips Videos (examples)	
Chrysler HVAC Test	Hyundai Blind Spot Detection System Calibration
Chrysler VVT System Cleaning	Hyundai Occupant Detection System Reset
Chrysler Wheel & Tire Calibrations	Ignition Coil Current and Voltage Comparison
COP Ignition Test	Ignition Coil Current Ramp Test
Dual Screen Diagnostics: Scanner vs. Scope	Ignition Coil Primary Voltage Test
Electronic Throttle Control System Diagnostics	Ignition System Diagnostics Using the SIA2000 (Scope)
FIAT® 500 Proxi Alignment	MINI Battery Relearn
FIAT® 500 Throttle Body Relearn	Multi Channel Cam / Crank Correlation
Flex Ray Bus Diagnostics	OBD-II Mode 10 Permanent Codes
Ford Battery Monitor System	Oil Specs & Service Light Resets
Ford Coil Current RFI Test (Scope)	PID Trigger Functions (Scanner)
Ford Flash Reprogramming	Piezo Injectors Signature Test
Ford Misfire Monitor Neutral Profile Correction (Scanner)	Relative Compression Test (Scope)
Ford PATS Key Programming	ShopStream Connect - Data Manipulation
Ford Relative Compression Test	ShopStream Connect - Software Updates
Ford Relative Injector Flow Test	Speed Up Your Diagnostics (Scanner)
Ford TPMS Reprogramming	The Power of Troubleshooter Tips (Scanner)
Ford® 6.7L Transmission Solenoid Characterization	Top Level Menus: Built In Scope Training
Ford® Diesel Injector Coding	Toyota EVAP Test
VW / Audi Flexible Service Reset (Scanner)	Toyota Multiple Freeze Frame (Scanner)
	Toyota Transmission Compensation Coding

Contents

Safety Information

READ ALL INSTRUCTIONS

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

For your safety, read all instructions. Use your diagnostic tools only as described in the tool user's manual. Use only manufacturer recommended parts and accessories with your diagnostic tools.

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

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 responsibility of the automotive technician 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 product only as described in it's user manual. Use only manufacturer recommended parts and accessories with your product.

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

Environmental Conditions:

- This product is intended for indoor use only
- This product is rated for Pollution Degree 2 (normal conditions)

Safety Signal Words

All safety messages contain a safety signal word that indicates the level of the hazard. An icon, when present, gives a graphical description of the hazard. Safety Signal words are.

⚠ **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 Message Conventions

Safety messages are provided to help prevent personal injury and equipment damage. Safety messages communicate the hazard, hazard avoidance and possible consequences using 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.

Safety Message 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 *Important Safety Instructions manual*.

SAVE THESE INSTRUCTIONS

Chapter 1 — Using This Manual

1.1 Content

This manual contains basic operating instructions and is structured in a manner to help you become familiar with your diagnostic tool features and perform basic operations.

The illustrations in this manual are intended as reference only and may not depict actual screen results, information, functions or standard equipment. Contact your sales representative for availability of other functions and optional equipment.

1.2 Conventions

The following conventions are used.

1.2.1 Terminology

The terms "Scanner" and "Scanner function" are used to describe the Scanner Function(s) of the diagnostic tool.

Examples:

- Select **Scanner** from the Home screen.
- From the Scanner main menu select **Continue**.
- The Scanner function provides many diagnostic tests.

The term "select" describes tapping/touching an icon on the touch screen, or highlighting an icon or menu choice and then selecting the confirmation menu choice such as **Continue, Accept**, **OK**, **Yes, or other similar** choice.

Abbreviated example for the following procedure: "Select **Brightness**"

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

1.2.2 Symbols

Different types of arrows are used. The "greater than" arrow (**>**) indicates an abbreviated set of selection (navigation) instructions.

Abbreviated example for the following procedure: "Select **Tools > Connect-to-PC**"

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 for the four directions of the directional buttons.

Example: Press the down ▼ arrow.

1.2.3 Bold Text

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

Example: Press the **OK** button.

1.2.4 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 diagnostic tool is communicating with the ECM.

1.2.5 Hyperlinks

Hyperlinks, or hot links, that take you to other related articles, procedures, and illustrations are available in electronic documents. Blue coloured text indicates a selectable hyperlink.

Example:

IMPORTANT:
Read all applicable Safety Information before using this diagnostic tool!

1.2.6 Procedures

An arrow icon in the left-margin area 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.

Introduction

This diagnostic tool allows you to communicate with various vehicle control systems (e.g. engine, transmission, antilock brake system (ABS), body, instrument cluster, etc) to:

- Perform OEM specific functional tests and relearn procedures
- Retrieve and clear diagnostic trouble codes (DTCs)
- View parameter (PID) data in text or graph format, and save it for future review
- Set and arm PID triggers to automatically capture and save PID data to buffer memory
- Access global OBD-II/EOBD service modes, freeze frame data, readiness monitors, and more

In addition you can:

- Quickly retrieve previously tested vehicles, to save setup time during repeat testing
- Save screen shots, to quickly capture specific data for future review
- Interface with ShopStream Connect™ software on your PC to transfer files from the diagnostic tool to your PC, download software updates and more.

This chapter introduces the basic features of the diagnostic tool, including the control buttons, data connections, battery pack and power sources. Technical Specifications are provided at the end of this chapter.

2.1   Control Buttons

There are four "push type" control buttons and one "thumb pad rocker type" multi-directional button located on the right side of the diagnostic tool. All other diagnostic tool operations are controlled through the touch screen.

Figure 2-1 *Front view*

Item	Button	Description	
1	**Y/✓ or Accept** - Push type button		• To confirm a selection from a menu or program. • To select an item that was highlighted using the direction arrows. • To advance to the next screen in a series. • To answer "Yes" when a yes or no choice is given.
2	**N/X or Cancel** - Push type button		• To exit a menu or program. • To close an open list and return to the previous menu or screen. • To answer "No" when a yes/no choice is given.
3	**Directional** - Thumb pad rocker type buttons		Buttons move the cursor or highlight in their respective direction: • Up (▲) • Down (▼) • Left (◄) • Right (►)
4	**(Shortcut)** - Push type button		Programmable function button that can provide a shortcut for performing a variety of routine tasks. Refer to Configure Shortcut Button, on page 58 for additional information.
5	**Power (On/Off)** - Push type button		Turns the diagnostic tool on and off. Also, press and hold for 5 seconds for emergency shutdown.

2.2   Data and Power Connections

All diagnostic tool connections are located on the top of the diagnostic tool.
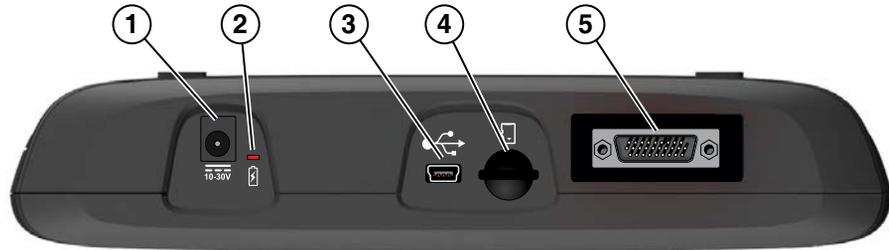
Figure 2-2 *Top view*

Item	Description
1	**AC Power Supply Jack** - connection for AC power supply
2	**Battery Status Indicator LED** • Green - battery is fully charged • Red - battery is charging • Amber - indicates there is a battery issue (correct before operating)
3	**Mini-b USB Jack** - connection for USB cable to a personal computer.
4	**Micro secure digital (µSD) Card** - contains operating system programming. *IMPORTANT The µSD card must be installed for the diagnostic tool to operate. Do not remove the µSD card while the diagnostic tool is powered on.*
5	**Data Cable Connector** - connection for vehicle data cable to vehicle data link connector (DLC).

2.3   Battery Pack Cover and Stand

1— **Built-in Stand -** The built-in stand extends from the back of the diagnostic tool and clips into the diagnostic tool for storage.

2— **Battery Pack Cover**

3— **Battery Pack Cover Screw**

Figure 2-3 *Back view*

2.4 Power Sources

Your diagnostic tool can be powered from any of the following sources:

2.4.1 Vehicle Power

All OBD-II/EOBD vehicles have vehicle battery power (B+) available on the DLC. The diagnostic tool is powered through the Data Cable when connected to the vehicle DLC. A green LED indicator on the DLC end of the data cable, illuminates when power is being supplied to the cable. If the LED fails to illuminate, check that the data cable is properly connected and then check the DLC power circuit. See Data Cable Connection, on page 20 for additional data cable information.

2.4.2 Internal Battery Pack

The diagnostic tool can be powered from the internal rechargeable battery pack. A fully charged battery provides sufficient power for about 3 hours of continuous operation.

Battery charging occurs when the diagnostic tool is connected to the AC Power Supply and to a live AC power source, or when the data cable is connected to an OBD-II/EOBD vehicle.

The Battery Status Indicator LED (located next to the power supply jack) indicates battery status (Figure 2-3).

- **Green** - indicates battery is fully charged
- **Red** - indicates battery is charging
- **Amber** - indicates a battery issue. This may be caused by excessive battery temperature (above 104°F/40°C), which disables charging. Allow the diagnostic tool to cool down before continuing operation.

2.4.3 AC Power Supply

The diagnostic tool can be powered from a standard AC outlet using the AC power supply. The connector on the end of the output cable of the AC power supply attaches to the power supply input jack on top of the diagnostic tool. Use only the AC power supply provided.

IMPORTANT:
Never connect the AC power supply to the power supply input on the diagnostic tool when the diagnostic tool is communicating with a vehicle.

2.5   Technical Specifications

Item	Description / Specification
Touch Screen	Resistive Touch Panel
Display	5.6 inch diagonal, LCD TFT
	640 x 480 resolution
	24 bit colour
Battery Pack	Rechargeable lithium-ion battery pack
	Approximately 3 hour run time
	Approximately 5 hour charge time
Operating System	SMX
Processor	Motorola
Input Operating Voltage	10 to 30VDC
AC Power Supply Rating	Input 110-240VAC, Output 15VDC - 2A
Width	8.90 in. (226 mm)
Height	5.67 in. (144 mm)
Depth	1.75 in. (44.5 mm)
Weight (including battery pack)	2.0 lb (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)

Chapter 3 — Basic Operation and Navigation

This chapter describes basic operation, navigation, screen layout, and icon functions. Before you operate the diagnostic tool, make sure the battery pack is fully charged or the diagnostic tool is powered by the AC power supply.

3.1 Turning On/Off and Emergency Shutdown

The following sections describe how to turn the diagnostic tool on and off and how to perform an emergency shutdown.

3.1.1 Turning On

The diagnostic tool will automatically turn on and open the Home screen (Figure 3-1) when power is supplied through the Data Cable or by the AC Power Supply. If the diagnostic tool does not automatically turn on, press and release the Power button on the front of the diagnostic tool to turn the diagnostic tool on.

3.1.2 Turning Off

IMPORTANT:
All vehicle communication must be terminated **<u>BEFORE</u>** turning off the diagnostic tool. A warning message displays if you attempt to turn the diagnostic tool off while communicating with the vehicle. Forcing a shut down while communicating may lead to ECM problems on some vehicles. Never disconnect the Data Cable when the diagnostic tool is communicating with the vehicle ECM.

▶ **To turn off the diagnostic tool:**

1. Press the **N/X** button or select the **Back** or **Home** icon to navigate to the Home screen.

   If vehicle communication is active, the "stopping communication" message appears briefly before the Home screen displays.

2. Disconnect the diagnostic tool Data Cable from the vehicle.

3. Press and release the **Power** button.

   A confirmation screen displays.

4. Press the **Y/✓** button or select **OK** from the menu to turn the diagnostic tool off. To continue operating, press the **N/X** button or select **Cancel** from the menu.

3.1.3 Emergency Shutdown

IMPORTANT:
Using the emergency shutdown procedure while communicating with a vehicle may lead to control module problems on some vehicles.

During normal operation turn the diagnostic tool off using the *Turning Off* procedure described previously. The emergency shutdown procedure should only be used If the diagnostic tool does not respond, or exhibits erratic or abnormal operation. To force an emergency shutdown, press and hold the **Power** button for five seconds until the diagnostic tool turns off.

3.2 Basic Navigation

3.2.1 Home Screen Layout

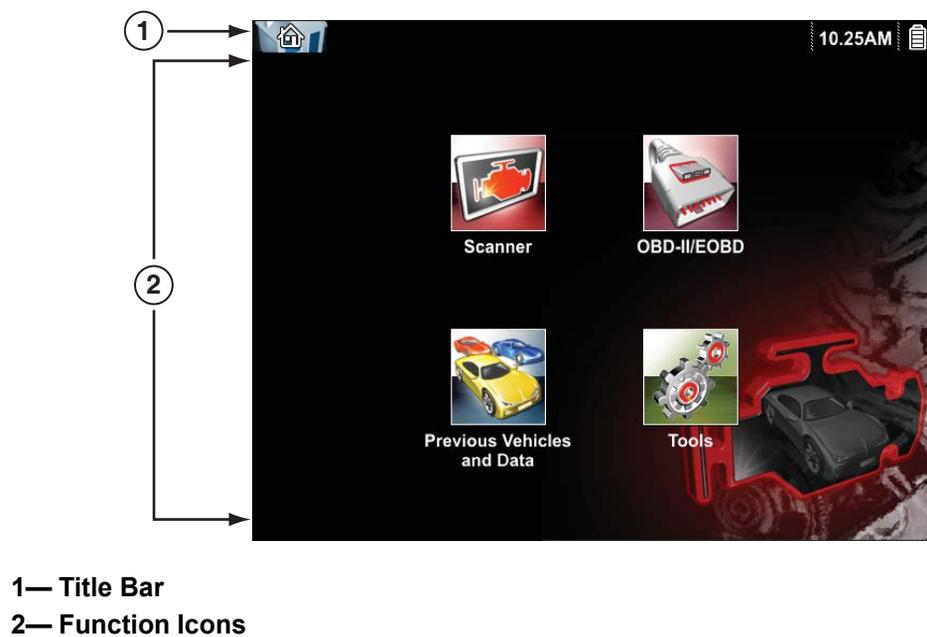The Home screen includes the title bar and function icons.

1— **Title Bar**
2— **Function Icons**

Figure 3-1 *Home screen*

3.2.2 Title Bar

The title bar at the top of the screen (Figure 3-1) provides basic information about current diagnostic tool operating conditions. Title bar options vary depending upon vehicle make and model, what function is active, what test is being performed, or what menu is selected. The title bar contains information only, there are no selectable items.

Figure 3-2 *Typical Title Bar (showing vehicle information)*

Information the title bar may display (varies upon active function):

- Active diagnostic function.
- Active communication indicator icon.
- Current time.
- Source and status of the power being supplied to the diagnostic tool.
- The identification (ID) of the test vehicle
- The name of the test being performed

An active function icon is always displayed in the title bar. These icons resemble their Home screen icon counterparts in appearance and colour. The name of the function displays to the right of the icon on some screens.

A clock is displayed in the title bar, and is powered by a dedicated internal battery, so the correct time is maintained even when the battery pack is discharged. See Clock Settings, on page 64, for clock setting instructions.

Table 3-1 *Title Bar Icons*

Icon	Function	Icon	Function
	Full Battery Charge Level - Indicates power is being supplied by the internal battery. Horizontal bars diminish as the battery discharges.		**External Power Connected -** Indicates power is being supplied through the data cable connection to a vehicle or by the AC Power Supply.
	Low Battery Charge Level - Indicates the internal battery is low. A warning message will also display on the screen when the battery discharges to a low level.		**Active Vehicle Communication -** Indicates the diagnostic tool is actively communicating with a vehicle.

3.2.3 Home Screen Icons

Each available diagnostic tool function is represented by a function icon on the home screen.

Select an icon from the Home (touch) screen to start a function. You can also use the control buttons to start a function. Use the directional buttons (◄, ►, ▲, ▼) to highlight (a yellow border around the icon indicates it is highlighted) the desired function and then press the **Y/✓** button to select it. A "please wait" message may display briefly, then automatically clear once the function is loaded and ready for use.

Table 3-2 *Home screen icons*

Function Name	Function Icon	Description
Scanner		Used to communicate with the electronic control systems of a vehicle. This function allows you to retrieve diagnostic trouble codes (DTCs), view PID data and perform diagnostic tests. See Scanner, on page 21, for details.
OBD-II/EOBD		Allows you to access generic OBD-II/EOBD data and tests without identifying the vehicle being tested. See OBD-II/EOBD, on page 40, for details.
Previous Vehicle & Data		Allows you to quickly reconfigure the diagnostic tool to a recently tested vehicle and to access saved data files.See Previous Vehicles and Data, on page 51, for details.
Tools		Allows you to adjust diagnostic tool settings to your personal preferences and perform other special functions. See Tools, on page 56, for details.

3.2.4 Common Toolbar Control Icons

Common control icon functions are described in the following table. Specific function control icons are described in their applicable chapters. Displayed control icons vary depending on the active function or test. Select a control icon on a screen to activate a control function. You can also use the control buttons to activate a function, a yellow border around the icon indicates it is highlighted, or in focus. Use the Directional buttons (◄, ►, ▲, ▼) to highlight the desired function and then press the **Y/✓** button to select it.

Icon	Function	Icon	Function
	Back - Returns to the previously viewed screen. Icon is located on the left-hand edge of the toolbar.		**Save** - Writes data from buffer memory to a file. The saved "movie" file can be accessed for future reference by selecting **Previous Vehicles and Data > View Saved Data**.
	Home - Returns to the Home screen. Icon is located next to the Back icon on the left side of the toolbar.		**Tools** - Opens the tools menu.

3.2.5 Scroll Bar

A vertical scroll bar appears along the right-hand edge of the screen when there is more data than can be displayed (Figure 3-3).
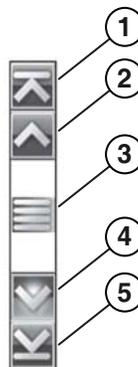

Figure 3-3 *Scroll bar*

1— **Beginning** - Moves to beginning of the data.
2— **Step up -** Moves up one increment of the data.
3— **Slider (position indicator) -** Select and drag the **Slider** to scroll through data. The slider indicates the relative position of the current screen to the total available data.
4— **Step down -** Moves down one increment of the data.
5— **End -** Moves to end of the data.

The Up (▲) and Down (▼) directional buttons can also be used to move through the data one line at a time. Press and hold a directional button to rapidly scroll through data.

3.3 Screen Messages

3.3.1 System Messages

There are four types of system messages that may be displayed:

Message Type	Description
Loading and Connecting	Loading and connecting messages display when the diagnostic tool is performing an internal operation, such as loading a database, establishing communications with the vehicle, or initiating a test. The message automatically clears once the internal operation is complete.
Confirmation	Confirmation messages inform you when you are about to perform an action that cannot be reversed or when an action has been initiated that requires a confirmation to continue.When a response is not required, the message displays briefly, then disappears.
Warning	Warning messages inform you when completing the selected action may result in an irreversible change or in the loss of data. A confirmation is required to continue.
Error	Error messages inform you when a system or procedural error has occurred, for example if the data cable becomes disconnected during operation.

3.3.2 Communication Messages

When "no communication" messages are displayed, it indicates the diagnostic tool and the vehicle electronic control module are not communicating.

The following conditions may cause "no communication" messages to display:

- The diagnostic tool is unable to establish a communication link with the vehicle.
- The vehicle is not equipped with the system that was selected.
- 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 adaptor.
- Incorrect vehicle identification was entered.

3.4   Data Cable Connection

Connection of the data cable to the diagnostic tool and vehicle data link connector (DLC) is required for Scanner and OBD-II/EOBD testing.

Depending on the vehicle, the supplied DA-4 data cable may be used alone or may require optional adaptors.

- **All OBD-II/EOBD compliant vehicles** - Use the supplied DA-4 data cable. The 26-pin end of the cable attaches to the data cable connector on the top of the diagnostic tool (secure with captive screws). The16-pin end connects to the vehicle DLC.
- **All non-OBD-II/EOBD (OBD-I) compliant vehicles** - Use the supplied DA-4 data cable with the optional DA-5 adaptor and a manufacturer specific adaptor. The 26-pin end of the cable attaches to the data cable connector on the top of the diagnostic tool. The16-pin end connects to the DA-5 adaptor, the DA-5 adaptor connects to the manufacturer specific adaptor and then connects to the vehicle DLC.

On-screen cable and adaptor connection instructions may be provided while using the Scanner and OBD-II/EOBD functions. The instructions may also include the location of the vehicle DLC (Figure 3-4).
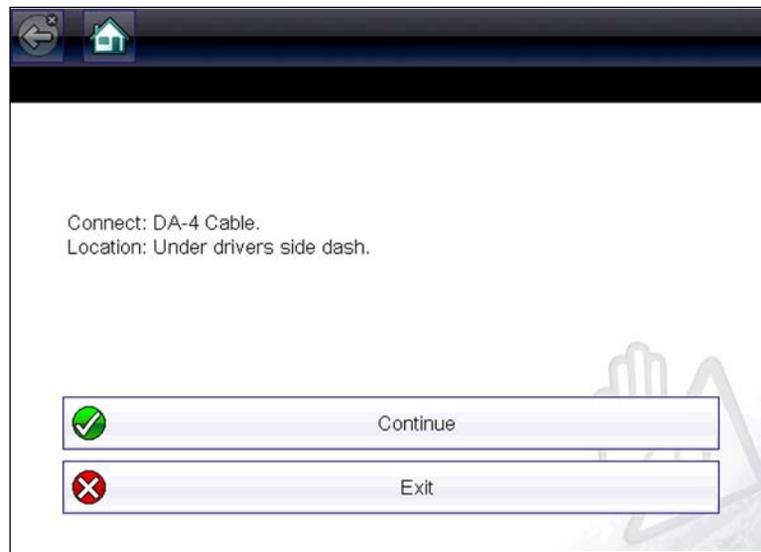
Figure 3-4 *Vehicle connection data cable message*

For data cable vehicle power connection information, see Vehicle Power, on page 12,.

Scanner

This chapter describes the basic operation of the Scanner function.

The **Scanner** icon is located on the Home screen.

The Scanner function allows your diagnostic tool to communicate with the electronic control systems of a vehicle. This allows you to retrieve diagnostic trouble codes (DTCs), view PID data and perform diagnostic tests.

4.1 Scanner Demonstration Program

The Scanner demonstration program displays actual vehicle data that allows you to navigate and become familiar with the many capabilities of the Scanner function without actually connecting to a vehicle. The following sections in this chapter provide detailed information on navigating through the Scanner function and various menus. As you navigate through the Demonstration program, refer to the applicable section for additional information.

▶ **To start the demonstration program:**

1. From the Home screen, select the **Scanner** icon.

    The manufacturer menu displays.

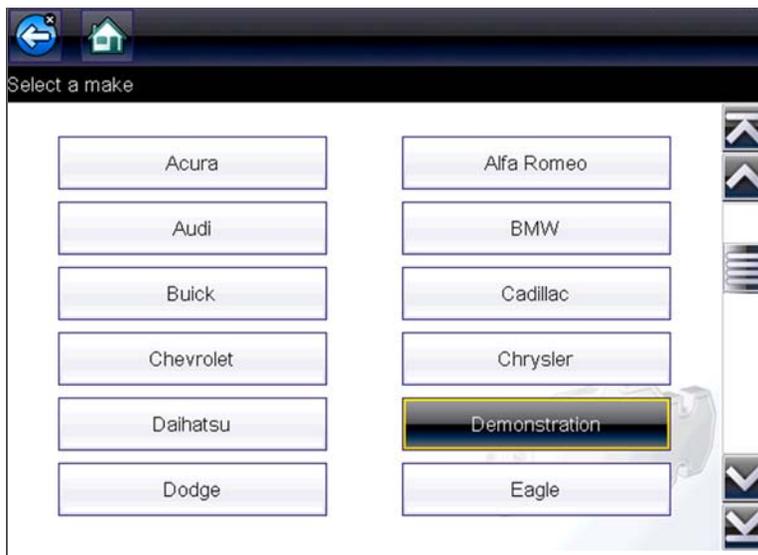2. Select the **Demonstration** icon.

Figure 4-1

IMPORTANT:
Do not connect a vehicle to the diagnostic tool while using the Demonstration program.

3. Follow the on-screen instructions and make the selection as needed until the confirmation screen displays.

4. Select **OK** on the confirmation screen to load the demonstration database.

A message displays "Demo mode: Do not connect to vehicle."

5. Select **Continue**.

A systems menu, which shows all of the systems available for testing, displays.

6. Select a system from the menu, then select submenus as applicable to display the desired demonstration information.

4.2 Screen Layout and Toolbar Icons

The following screen layout and toolbar controls apply to both the Scanner and the OBD-II/EOBD functions.

4.2.1 Screen Layout

1— Title bar—shows active test, vehicle and diagnostic tool status
2— Toolbar—contains control icons
3— Main body—displays menus, PID and test data

Figure 4-2 *Screen layout*

The Title bar appears for all functions and displays information only, there are no selectable items. Refer to Title Bar, on page 16 for details.

4.2.2 Scanner Control Icons

The scanner toolbar contains control icons. Control icons may vary depending on the active function or test. A yellow frame surrounding an icon (highlighted), indicates it is selected. Other control icons (not shown) are described in Common Toolbar Control Icons, on page 18.

Icon	Function	Icon	Function
	Pause - Indicates PID data from the vehicle is being displayed. Selecting pauses data collection.		**Custom Data List** - Opens a menu for selecting which PIDs display in the list.
	Clear - Erases all the PID data in the buffer and begins a new recording. Selecting opens a confirmation message.		**Change View** - Changes display options between PID list or graph displays.
	Trigger - Opens a menu that allows you to set, arm, and clear threshold values that automatically trigger PID data to be saved from buffer memory to a file.		**Lock/Unlock** - Locks or unlocks the highlighted parameter. Locked PIDs move to the top of the list and do not scroll as you move through the data.
	Zoom - Incrementally increases and decreases the scale of the data being displayed.		**Sort** - Determines the order in which PIDs are listed on the screen.
	Record - Indicates the data being displayed is paused and not being updated. Selecting resumes data collection.		

The control icons below are used to navigate through paused or saved "movie" files during playback.			
	Step Forward - allows forward movement in singular steps. To quickly step forward, select this icon (yellow frame appears) then press and hold the Y/✓ button. **Note:** To quickly step forward during Scanner data playback, press and hold the icon down. During this mode a red frame appears around the icon.		**Step Back** - allows backward movement in singular steps. To quickly step backward, select this icon (yellow frame appears) then press and hold the Y/✓ button. **Note:** To quickly step backward during Scanner data playback, press and hold the icon down. During this mode a red frame appears around the icon.

4.3 Scanner Operation

4.3.1 Vehicle Identification

The vehicle must be correctly identified for the diagnostic tool to communicate, and display data correctly. Menus and navigation will vary by vehicle.

Depending on the vehicle, the vehicle identification process may require manual entry of the vehicle information, or it may be automated. The following Scanner functions are available to identify the vehicle:

Auto ID - Automatically completes the identification process after the vehicle make and year are manually entered.

Manual ID - Allows for manual entry of all required vehicle identification criteria.

▶ **Use the following procedure to identify a vehicle.**

ℹ️ **NOTE:**
The following procedure applies to most OBD-II vehicles, and may vary depending on the vehicle. Not all vehicles support the Auto ID function.

1. Connect the data cable to the diagnostic tool. See Data Cable Connection, on page 20.
2. Turn the vehicle ignition switch on.
3. Connect the data cable to the vehicle data link connector (DLC). See Data Cable Connection, on page 20.

ℹ️ **NOTE:**
If the diagnostic tool is off, when the OBD-II data cable is connected to the vehicle DLC, the diagnostic tool should automatically turn on. If the tool did not turn on when the data cable was connected to the vehicle, check the vehicle DLC for power. Most OBD-II vehicles supply power to the DLC, which in-turn supplies power and turns on the diagnostic tool when the cable is connected.

4. If required, turn the diagnostic tool on.
5. Depending on the vehicle, identification options may be displayed. Choose **Automatic ID** or **Manual ID.**
6. Follow the screen prompts to enter all required information to identify the vehicle.
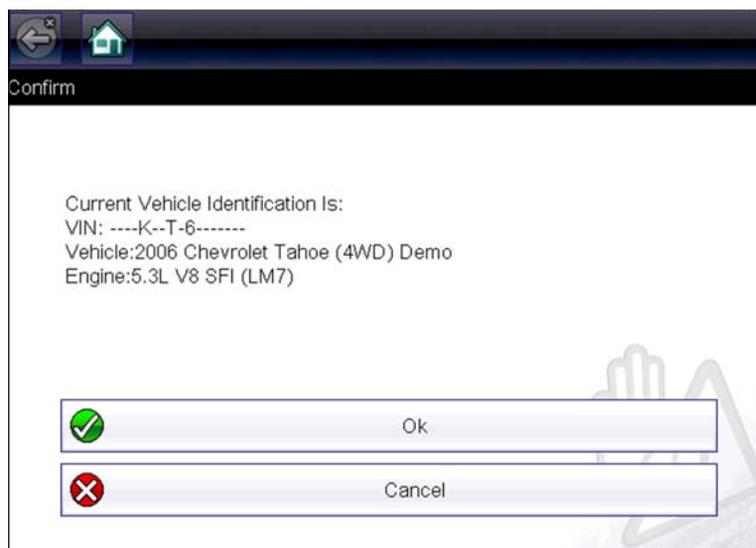
Figure 4-3 *Vehicle confirmation screen*

7. After the vehicle is identified, a menu of available systems, and options are displayed. Select a system or option (Figure 4-4).

ℹ️ **NOTE:**
Only the systems and options supported for the vehicle are included in the menu list.

Figure 4-4 *Typical systems menu*

If a system (e.g. Engine, Transmission, Antilock Brakes, etc) is selected, the diagnostic tool may establish communication with the vehicle, then display the system main menu (available tests) (Figure 4-5). For sub-menu option information, see System Main Menu Options, on page 29.

Figure 4-5 *System main menu*

4.3.2 Code Scan

One of the benefits of performing a code scan is that you can quickly show your customer diagnostic related issues with a pre scan report, and then after repairing the issues you can use the post scan report to show that the repairs were completed (Figure 4-6). In addition, by using ShopStream Connect the reports can be given to the customer and also saved for your own records, for more information, see ShopStream Connect, on page 72.

IMPORTANT:

PRE / POST Scan Importance - As many systems do not turn on the check engine light or other indicator, performing a vehicle code scan before making any repairs may help in troubleshooting, by identifying possible unknown issues that may be related to the present symptoms.

Performing pre and post scans also allows you to record in report format the pre-condition of the vehicle and compare the post scan after work is complete to confirm the repairs were completed properly.

Pre and post scan is required by some manufacturers for pre and post collision work as well as by some insurance companies.
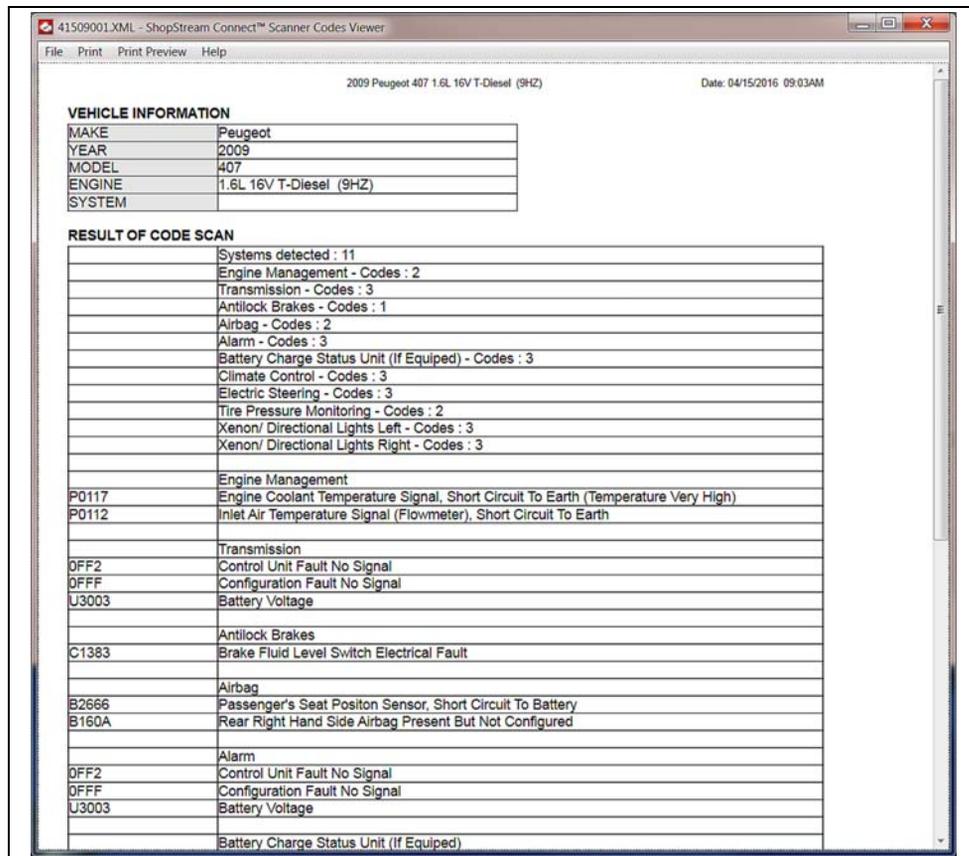

Figure 4-6 *Typical Code Scan Report in Shopstream Connect*

Depending on the vehicle, Code Scan (if supported) may be available from the Systems menu. Selecting **Code Scan** starts an active scan of vehicle control modules, and opens the Code Scan results screen (Figure 4-7). A progress indicator is shown at the top indicating the active scanning progress. Once completed, the results are displayed by system category.

The following Code Scan related control icons are used:

Icon	Function
	Refresh - Restarts the code scan
	System - Opens the main menu of the system selected

The following results are displayed progressively as the modules are scanned:

- **The total number of systems (modules) detected** (Figure 4-7)**.**

Figure 4-7 *Code Scan systems analyzed result total*

- **A list of all the systems analyzed with DTCs totals.** A categorized system list with DTC totals is displayed in the order they are scanned. To view the main menu for a system in the list, select the system, then select the **System** icon (Figure 4-8).

Figure 4-8 *System icon (opens Main Menu)*

Saving Codes, and Code Scan Results)

When using the code scan feature, or when viewing individual system codes (e.g. engine, transmission) selecting the **Save** icon from the toolbar saves the results as a data file.

The saved file(s) can be viewed using two methods:

- On the diagnostic tool - See View Saved Data, on page 52.
- Using ShopStream Connect - See ShopStream Connect, on page 72.

Printing the Code Scan Report

The vehicle system report can also be customized and printed using ShopStream Connect - See Printing the Code Scan Report, on page 76.

Clear All Codes Read by Code Scan

Selecting **Clear All Codes Read by Code Scan** erases all DTCs from all vehicle system modules that were read by Code Scan.

NOTE:
Clear All Codes Read by Code Scan may not clear global OBD-II codes on some vehicles.

4.3.3 System Main Menu Options

Once a System is selected (e.g. Engine, Transmission, Antilock Brakes, etc), the diagnostic tool may establish communication with the vehicle, then display the System Main Menu (available tests).

NOTE:
Menus and navigation will vary by vehicle.

The System Main Menu may include:

- **Codes Menu**—displays diagnostic trouble code (DTC) records from the vehicle electronic control module. Selecting may open a submenu of viewing options.
- **Clear Codes**—erases DTC records and other data from the electronic control module (ECM). This selection is found on a Codes submenu for some models.
- **Data Display**— displays PID data from the vehicle ECM. Selecting may open a submenu of viewing options.
- **Functional Tests**—provides specific subsystem 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).

The following sections, describe some of the System Main Menu items listed above.

4.3.4 Codes Menu

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 viewing options that includes:

- Display Codes
- Clear Codes, on page 30
- Freeze Frame/Failure Records, on page 31

Display Codes

This function opens either a list of diagnostic trouble codes (DTCs) stored in the selected vehicle electronic control module (ECM), or a submenu of DTC viewing options. The code list includes the DTC and a brief description (Figure 4-9).
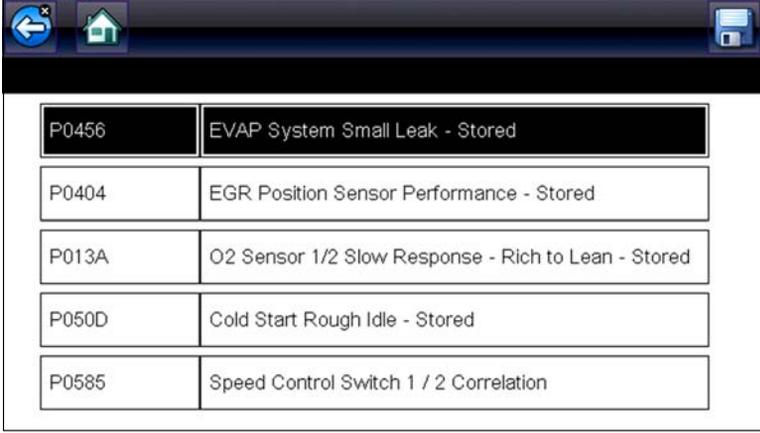
Figure 4-9 *DTC results*

Submenu options may include:

- **Trouble Code Information**—opens a list of codes in ECM memory
- **History Codes**—opens a list of 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 turn on the malfunction indicator lamp (MIL) or service vehicle soon (SVS) lamp, or display a driver information alert.
- **Last Test Failed**—displays a complete list of failed tests.
- **Test Failed Since Code Cleared**—displays a list of tests that failed since the last time codes were cleared from ECM memory.

Clear Codes

The diagnostic tool clears codes from the vehicle electronic control module memory on most vehicles. If this function is not available on the test vehicle, Clear Codes does not appear as a menu option.

NOTE:
Clear Codes is also available from OBD-II Health Check (see OBD Health Check, on page 41).

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.
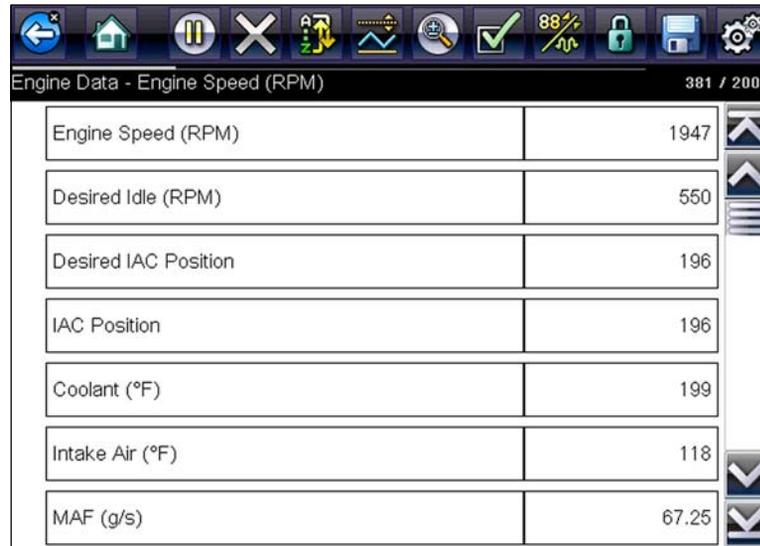
IMPORTANT:
Clearing codes erases all temporary ECM information, including Freeze Frame/Failure Records. Make sure no vital diagnostic information will be lost before clearing codes.

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.

Data Display

Select **Data** to view PID data from the vehicle ECM. In data display mode the screen has a toolbar and a main body (Figure 4-10).

Figure 4-10 *Data display screen*

The toolbar control icons are described in Scanner Control Icons, on page 23 and Common Toolbar Control Icons, on page 18.

During data display the main body of the screen is divided into two columns; the left-hand column has 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 expect variations between years, makes, and models.

Up to three parameters can be locked, or fixed, at the top of the list. Locked parameters do not change as you scroll through the parameter list. The **Lock/Unlock** icon on the toolbar selects which parameters are fixed (see Locking Parameters, on page 34).

Displayed data may also be paused or saved for detailed review and future reference, see Saving Files, on page 37 and Pausing and Reviewing Data Files, on page 31.

Pausing and Reviewing Data Files

During normal operation, data from the vehicle's ECM is continuously being stored in buffer memory as it is displayed onscreen. The Pause feature, allows you to temporarily pause data collection to review it in detail.

▶ **To pause and review data**

Toolbar control icons are described in Scanner Control Icons, on page 23 and Common Toolbar Control Icons, on page 18.

1. While viewing data, select the **Pause** icon.

   On the toolbar, the playback control icons are displayed. A counter displays along the right-hand edge of the screen between the toolbar and the main body. A bar graph to the left of the counter shows how much data is in the memory buffer. A slider on the bar graph indicates the position of the current screen in relation to the entire contents of the data buffer.

   Use the slider to quickly scroll through the data. Use the control icons to accurately position the cursor. The cursor (vertical line), indicates your position when in the graph mode, appears once you begin navigating (Figure 4-11).
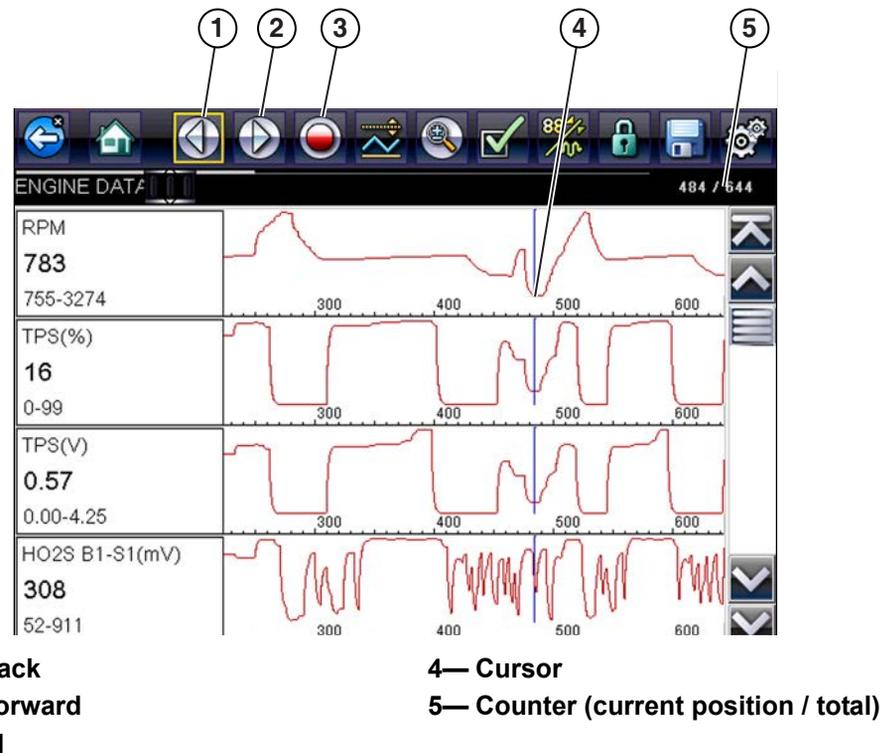
1— Step Back   **4— Cursor**
2— Step Forward   **5— Counter (current position / total)**
3— Record

Figure 4-11

2. Scroll up or down to review the list of data.
3. Select the desired control icon to move forward or back in the selected direction.

▶ **To resume:**

- Select the **Record** icon.

  The display changes back to display data and the **Pause** icon is shown on the toolbar. A vertical rule is displayed on the data graph to indicate data was paused at that point.

NOTE:
The **Shortcut** icon can be set to perform the Pause/Play function. See Configure Shortcut Button, on page 58 for additional information.

Customizing the Data List

The **Custom Data List** icon 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 symptom-specific data parameters. You can add or remove most parameters from the list. Certain vital parameters may not be removed. These appear in gray at the top of the list along with a lock icon, and they cannot be selected.

NOTE:
Limiting the number of parameters that display to those that apply to a particular situation results in a faster data refresh rate, and reduces the amount of memory used for saved files.

To create a custom data list:

1. Select the **Custom Data List** icon on the toolbar.

   The data selection screen displays and selection icons appear. Check marks to the left of the parameter description indicate which parameters are selected for display.

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

Icon	Description
	Select/Deselect, hide or display individual parameters in the list.
	Select All/Deselect All, hide or display all parameters in the list.

2. Create a custom data list by selecting (check mark box by parameter name) the parameters to include.
3. Select **Back** to display the updated data list.

Changing Screen Views

Selecting the **View** icon opens a drop-down 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 4-10).

The 1, 2, and 4 Graph views divide the screen horizontally to simultaneously display data graphs for the indicated number of parameters (Figure 4-12). Use the scroll bar or the **up (▲)** and **down (▼)** icons to view other parameters in the list.
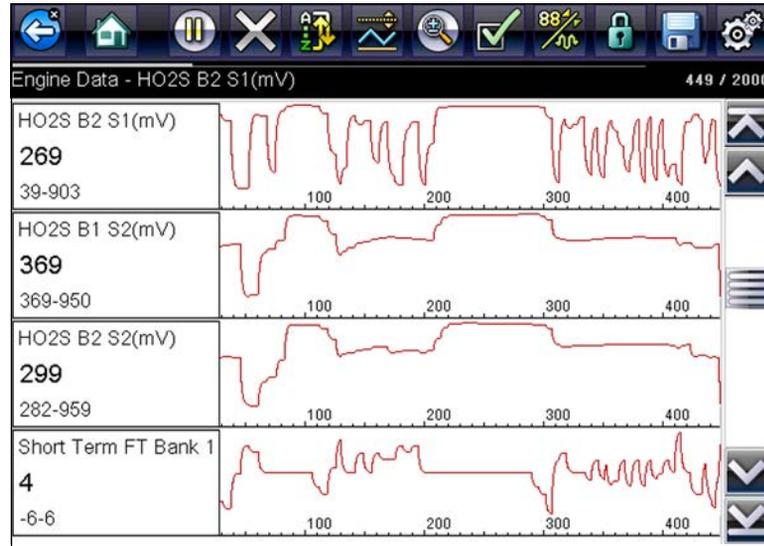
Figure 4-12 *Four graph view*

> **NOTE:**
> Any previously set conditions, such as sort order or locked data, remain in effect when the screen view is changed.

Locking Parameters

Use the **Lock/Unlock** icon to hold 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. This feature allows you to position related parameters together, making it easier to monitor their values and spot inconsistencies.

Locked parameters display as the top frames on the main body of the display screen, as well as at their usual position within the data list (Figure 4-13). A lock icon appears to the left of the parameter name to indicate it is locked.

To lock parameters:

1. Highlight the parameter to be locked.
2. Select the **Lock/Unlock** icon on the toolbar to lock it.

   A copy of the locked parameter is now shown at the top of the data list, and a lock icon appears alongside the parameter name.
3. Highlight and select additional parameters to lock.

   Up to three parameters can be locked at a time. Once locked, a parameter remains locked until it is manually unlocked, or communication with the vehicle is stopped.

Figure 4-13 *Locked parameters*

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

To unlock parameters:

1. Scroll through the data list and highlight the parameter to be unlocked, or released.
2. Select the **Lock/Unlock** icon on the toolbar.

   The released parameter and the lock icon disappear from the top of the data list.
3. Repeat Step 1 and Step 2 to release other parameters if needed.

Setting Trigger Levels

The trigger icon allows you to configure the diagnostic tool to automatically save PID data from buffer memory to a file when a parameter value crosses a threshold. When a trigger is armed, if a trigger event (activated) occurs data collection is stopped and saved to a data file. After a trigger has been activated, it must be re-armed to collect additional data.

Selecting the **Trigger** icon 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 diagnostic tool to capture an event when the signal crosses a threshold value.

  Trigger lines change colours to indicate the trigger is armed.
- **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 for triggering the recording.
2. Select the **Trigger** icon.
3. Select **Set Trigger** from the drop-down menu.

   A graph of the highlighted parameter with a trigger toolbar above it fills the main body of the screen (Figure 4-14).
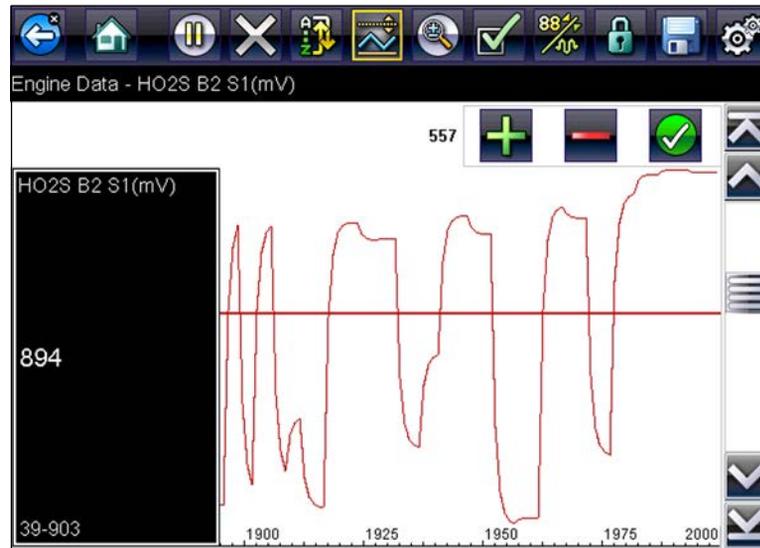

Figure 4-14 *Trigger set screen*

The trigger level line displays as a solid line running horizontally across the data graph. An upper and lower trigger level must be set, the upper level is set first.

4. Select the plus (**+**) and minus (**–**) icons on the toolbar, or use the up ▲ and down ▼ arrow buttons to position the upper trigger level to where you want it on the graph.
5. Select ✓ on the toolbar, or press the **Y/✓** button, to set the upper threshold.

   A lower trigger level line now appears at the mid-point of the graph.
6. Select the plus (**+**) and minus (**–**) icons on the toolbar, or use the up ▲ and down ▼ arrow buttons to position the lower trigger level line to where you want it on the graph.
7. Select ✓ on the toolbar, or press the **Y/✓** button, to set the lower threshold.

The display returns to the PID data view and the trigger points appear as horizontal lines across the designated parameter graph. 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 data to a file.

NOTE:

ℹ 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. Select the **Trigger** icon on the toolbar.
2. Select **Arm Triggers** from the drop-down menu.

   The trigger lines on the data graphs change colour 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, or the trigger is activated. If trigger settings are modified or are added for other parameters, they are armed as soon as you exit the setting screen.

4.3.5 Saving Scanner / OBD-II/EOBD Data Files

The following procedures are used when saving and reviewing data files for Scanner and OBD-II/EOBD.

Saving Files

During normal operation, data from the vehicle's ECM is continuously being stored in buffer memory as it is displayed onscreen. Buffer memory is limited to a predetermined "total" size and is displayed on the counter (located below the toolbar on the right side of the screen) (Figure 4-11).

Selecting **Save** writes the stored buffer memory to a file. Saving data is useful when trying to isolate an intermittent problem or to verify a repair during a road test. The saved file can be played back (similar to a movie clip) by selecting **Previous Vehicles and Data > View Saved Data**. See View Saved Data, on page 52 for additional information.

NOTE:
The **Save icon** performs the same function as "Save Movie" function choice for the programmable **Shortcut** button, see Configure Shortcut Button, on page 58 for details.

The saved data file can also be viewed, printed, or transfered to a personal computer using ShopStream Connect. See Connect-to-PC, on page 57.

The toolbar control icons are described in Scanner Control Icons, on page 23 and Common Toolbar Control Icons, on page 18.

▶ **To save data:**

- Select **Save**.

  A save dialog box displays while data is being saved. The data is saved when the message box disappears.
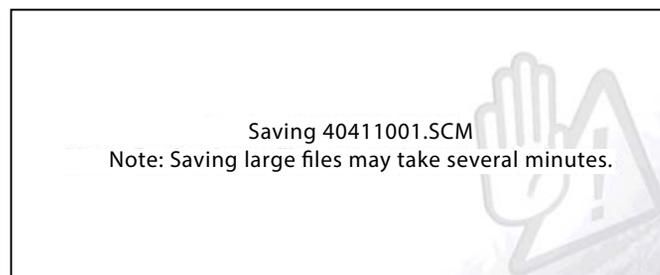
Saving 40411001.SCM
Note: Saving large files may take several minutes.

Figure 4-15 *Save dialog box*

Saving Screens

The **Shortcut** button can be programmed to save a snapshot of a visible screen as a bitmap file, see Configure Shortcut Button, on page 58 for details The saved file can be viewed by selecting
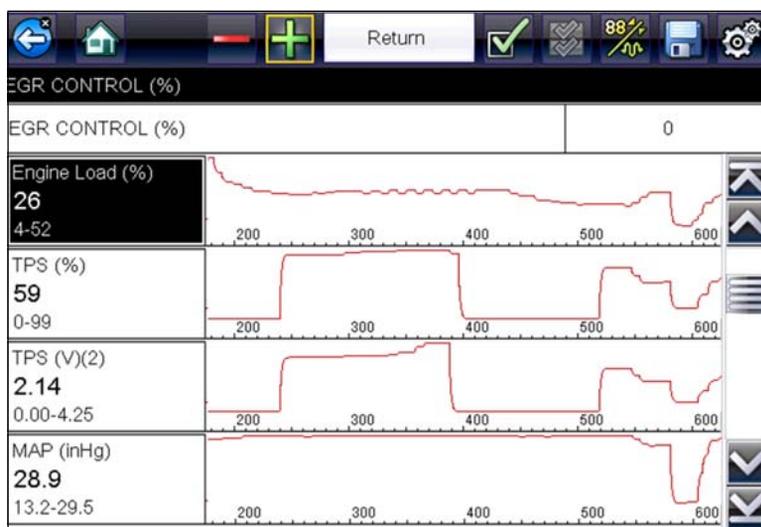
4.3.6 Functional Tests

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

There are several types of functional tests:

- **Information Tests**—these are read-only tests, like selecting "VIN" from a Functional Tests menu to display the VIN of the identified vehicle.
- **Toggle Tests**—these tests switch a component, such as a solenoid, relay, or switch, between two operating states.
- **Variable Control Tests**—these tests command a certain value for a system or component, such as varying spark timing in 1° increments or EGR valve duty cycle in 10% increments.
- **Reset Tests**—these tests reset the adaptive, or learned, values that are stored in the vehicle electronic control module memory.
- **Scripted Tests**—these tests are software routines that place the vehicle into special operating modes for performing certain repairs, such as bleeding brakes with ABS.

Selecting Functional Tests opens a menu of test options that varies by make, year, 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 and the vehicle being serviced.

Toggle and variable control tests often display functional test controls on the toolbar at the top of the screen with PID data in the main body (Figure 4-16).

Figure 4-16 *Functional test screen*

A Test icon on the toolbar activates the test, and a Return, or similarly named, icon cancels the test. For variable control tests, the variable value displays between the main body and the toolbar. Plus and Minus icons on the toolbar increase and decrease the variable value.

A Data List icon, is available on the toolbar for some tests. This feature allows you to change which data list displays in the main body without exiting the functional test. The icon is only available when the test is inactive.

4.3.7 Generic Functions

Generic Functions are used to access generic OBD-II/EOBD data on vehicles that support it. For additional information see OBD-II/EOBD, on page 40.

4.4 Exiting Scanner

The Scanner function remains open as long as there is an active communication link with the vehicle. You must interrupt this communication link in order to exit from tests and power down the diagnostic tool. A warning message displays if you attempt to shut down while the diagnostic tool is communicating with the vehicle.

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

To exit the Scanner function:

1. From any active data screen, select the **Back** icon on the toolbar.

    The "stopping communications" message briefly displays followed by the Data menu.

2. From the Data Menu, select **Back** on the toolbar.

    The "stopping communications" message displays again, then the Main menu. Once the Main menu is displayed, communication has been terminated and it is safe to return to the Home screen and power down the diagnostic tool.

OBD-II/EOBD

This chapter describes the basic operation of the OBD-II/EOBD function.

The **OBD-II/EOBD** icon is located on the Home screen.

The OBD-II/EOBD function allows you to access "generic" OBD-II/EOBD data. Generic OBD-II/EOBD data is data limited to emission related diagnostics such as:

- Checking for emissions-related diagnostic trouble codes (DTCs)
- Checking the cause of an illuminated malfunction indicator lamp (MIL)
- Checking monitor status prior to emissions certification testing

To access other available electronic control module (ECM) data for vehicle specific systems, parameters or enhanced diagnostics use the Scanner function, see "Scanner" on page 21.

NOTE:
The OBD-II/EOBD function can also be used to access "generic" OBD-II/EOBD data for OBD-II/EOBD compliant vehicles that are not included in the Scanner function databases.

5.1 Basic Operations

5.1.1 Screen Layout and Toolbar Controls

Screen layout and toolbar controls are similar to the Scanner function, see Screen Layout and Toolbar Icons, on page 22,.

5.1.2 Connecting the Data Cable

Connection of the data cable to the diagnostic tool and vehicle DLC is required for OBD-II/EOBD testing, see Data Cable Connection, on page 20,.

5.1.3 Saving and Reviewing Data Files

Save and Pause control icon operation and data review procedures are the same as used for the Scanner function, see Saving Scanner / OBD-II/EOBD Data Files, on page 37,.

5.2 OBD-II/EOBD Menu

5.2.1 OBD Health Check

The OBD-II Health Check offers a way to quickly check for and clear emissions-related diagnostic trouble codes (DTCs), and to check readiness monitors for emissions testing. Selecting opens the Health Check main menu (Figure 5-1). Make a selection to continue.
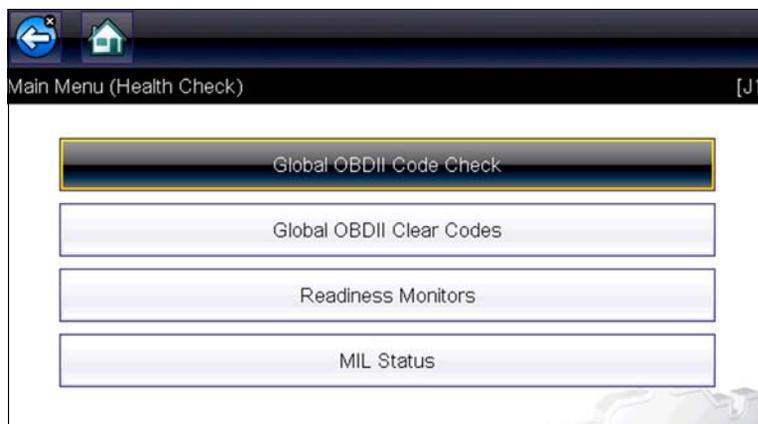

Figure 5-1 *OBD Health Check menu*

Global OBD II Code Check

Global OBDII Code Check displays stored emission related generic DTCs reported by the ECM. Selecting opens a submenu with two choices: Codes and Pending Codes. Either option opens a code list (Figure 5-2).
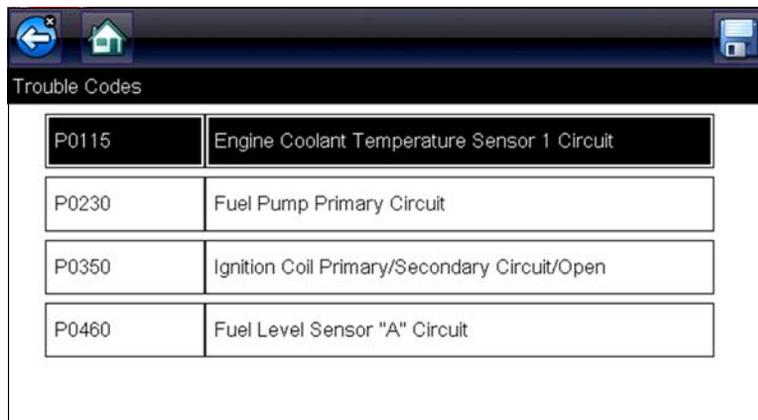

Figure 5-2 *Code list*

Codes

The Codes option displays a list of current emission related DTCs.

OBD-II/EOBD Codes have a priority according to their emission severity. The priority of the code determines the illumination of the MIL and the code erase procedure. Vehicle manufacturers have implemented the ranking differently, so there are differences between makes.

Pending Codes

The purpose of this service is to enable the diagnostic tool to obtain "pending" or maturing diagnostic trouble codes. These are codes whose setting conditions were met during the last drive cycle, but need to be met on two or more consecutive drive cycles before the DTC actually sets.

NOTE:
Save valuable time by using this service to verify test results after a single drive cycle following a vehicle repair and code clearing procedure.

- If a test failed during the drive cycle, the DTC associated with that test is reported. If the pending fault does not occur again within 40 to 80 warm-up cycles, the fault is automatically cleared from memory.
- Test results reported by this service do not necessarily indicate a faulty component or system. If test results indicate another failure after additional driving, then a DTC is set to indicate a faulty component or system, and the MIL is illuminated.

Global OBD II Clear Codes

This option 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. Although OBD-II/EOBD displays generic OBD-II/EOBD data only, clearing codes erases all of the stored data, including any enhanced codes and freeze frame information.

A confirmation screen displays when the clear codes option is selected to prevent accidental loss of data. Select to continue from the confirmation screen.

Readiness Monitors

This test checks the status of the readiness monitoring system. An OBD-II /EOBD control system runs continuous and periodic tests to check the status of emission-related subsystems to gauge the integrity of the electronic operations. Two options are available for Readiness Monitors:

- **Monitors Complete Since DTC Cleared**—displays the status of all monitors that have run since the last time ECM memory was erased.
- **Monitors Complete This Cycle**—displays the status of the monitors that ran during the current drive cycle only.

Select either option and test results are shown in the data viewer (Figure 5-3).

Figure 5-3 *Readiness monitor test report*

Scroll to view the entire list of Readiness Monitors to ensure that all tests are complete. Select **Save** from the toolbar and follow the screen prompts to save a copy of the monitor report as part of the vehicle records.

MIL Status

This test checks the ECM commanded state (on or off) if the malfunction indicator lamp.

5.2.2 OBD Direct

OBD Direct includes the following menu and submenu choices:

- **OBD Diagnose**
    - **Start Communication** - initiates a test session
    - **Connector Information** - provides DLC location details
    - **Manual Protocol Selection** - provides choices for communication protocol
- **OBD Training Mode** - allows you to familiarize yourself with the capabilities of OBD-II/EOBD while navigating through menus without being connected to a vehicle.

Start Communication

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

▶ **To perform an OBD-II/EOBD Test:**

1. Connect the data cable to the test vehicle.
2. Select **Start Communications** from the OBD-II/EOBD menu.

   A series of messages are displayed indicating automatic detection of vehicle type (12 or 24 V) has occurred and then the detected controllers are displayed.

   The diagnostic tool establishes a communication link with the test vehicle, then opens an information screen (Figure 5-4).
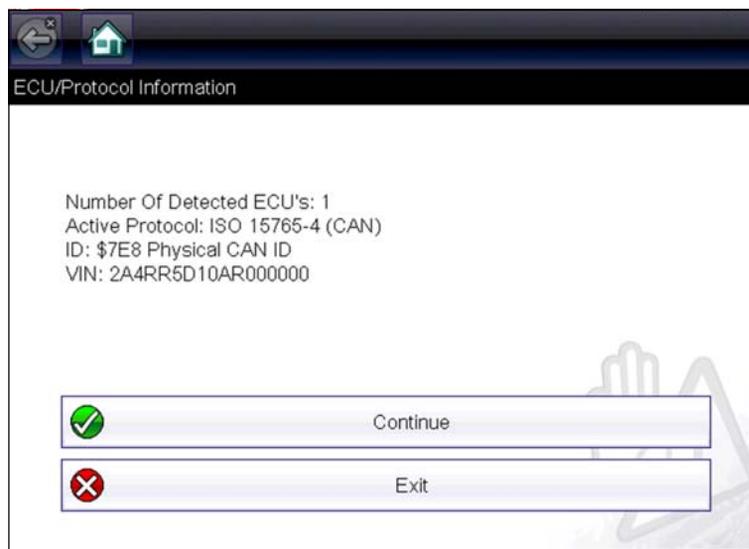

Figure 5-4

The information screen shows how many control modules were detected, which ECM is communicating, and which communication protocol is being used.

3. Select **Continue**.

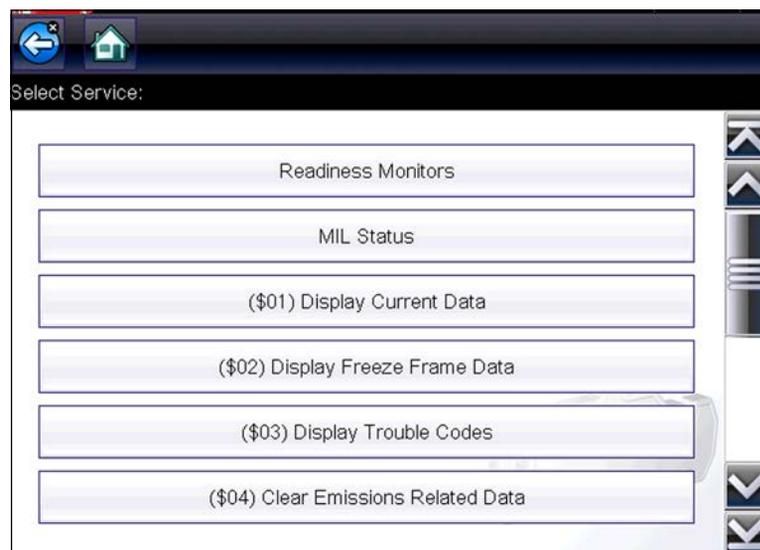   A Select Service menu of available tests opens:

IMPORTANT:

All service modes are not supported by all vehicles, so the available menu selections will vary.

Figure 5-5 *Service mode menu*

4. Select a test to continue.

Readiness Monitors

Use this menu item to check the readiness of the monitoring system. Monitors not supported will display "not supported". Scroll, if needed, to view the entire list of monitors (Figure 5-5). 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 vehicle electronic control module (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.

Figure 5-6

MIL Status

This item is used to check the current condition of the malfunction indicator lamp (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. The MIL Status report can also be saved as part of the vehicle records.

($01) Display Current Data

Use this test to display the serial data transmitted by the selected vehicle electronic control module (ECM). The main body of the screen has two columns; the left-hand column is a description of the parameter and the right-hand column is the parameter value or state. Viewing options and operations are the same as the Scanner function, see Data Display, on page 31, for more information.

ID : $	E8
ENGINE SPEED(1/min)	2539
ABSOLUTE THROTTLE POSITION(%)	17.6
ABSOLUTE THROTTLE POSITION B(%)	17.6
RELATIVE THROTTLE POSITION(%)	7.5
COMMANDED THROTTLE ACT .CONTROL(%)	7.5
ACCELERATOR PEDAL POSITION D(%)	16.5
ACCELERATOR PEDAL POSITION E(%)	7.8

Figure 5-7 *Current data display*

($02) Display Freeze Frame Data

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

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 emissions, have a higher priority. In these cases, the highest priority DTC is the one for which the freeze frame records are retained.

($03) Display Trouble Codes

This is used to display any stored emission related DTCs reported by the ECM. The display is similar to the Scanner function code display (see Display Codes, on page 29, for details). The list does not include enhanced DTCs in this mode.
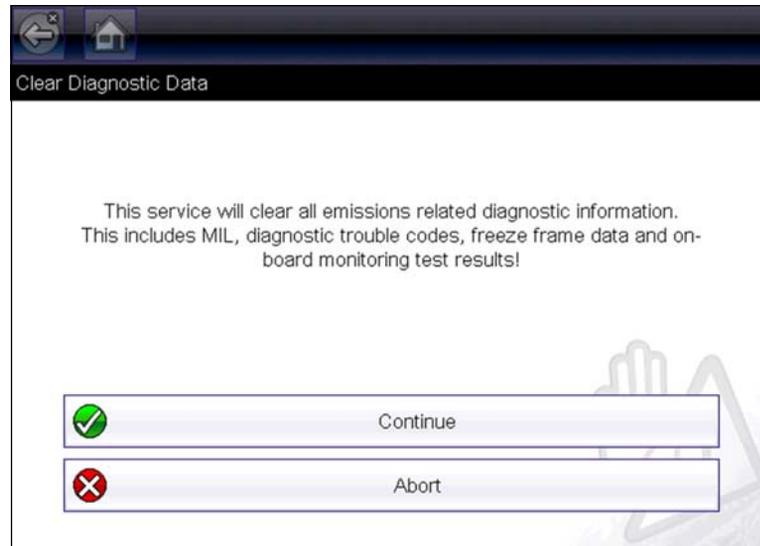
($04) Clear Emissions Related Data

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.

▶ To clear emission related Data:

1. Select **Clear Emissions Related Data** from the menu.

    A confirmation message displays to help prevent loss of any vital data (Figure 5-8).

Figure 5-8 *Clear codes confirmation message*

2. Continue from the confirmation message.

    The screen updates several times as ECM memory is erased, then a "data has been cleared" message displays.

3. Select **Continue** to return to the Select Service menu.

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

This option opens a submenu of parameters and test results from various sensors, monitor test results, and a record of DTC setting conditions detected during the last drive cycle. The submenu includes:

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

($05) Oxygen Sensor Monitoring

This option opens a menu of tests available for checking the integrity of the oxygen (O2) sensors. Making a selection displays all of the pertinent O2 sensor parameters for the specific test. The test identification (ID) displays at the top of the data list.

($06) On-board Monitored Systems

This option opens a menu of tests from the monitored systems. The available data is for specific systems and components that the on-board diagnostic system monitors continuously, such as misfire, or non-continuously, such as the catalyst system. Making a menu selection displays the test results.

($07) DTCs Detected During Last Drive

This test opens a record of any DTCs that set during the last completed drive cycle. Select to open the DTC list.

($08) Request Control of On-board System

This service enables bidirectional control of the ECM. This service allows the diagnostic tool to control the operation of an on-board system, test, or component.

($09) Read Vehicle Identification

The purpose of this service is to enable the diagnostic tool to request and display vehicle-specific information, such as the vehicle identification number (VIN), the calibration identification, and the calibration verification number (CVN), of the test vehicle. Select a menu item to retrieve the information. Select **Return** to go back to the menu.

($09) In-use Performance Tracking

This option displays the "In-use Performance Tracking" of data. It is a record of the number of times each of the monitor tests have been completed. Select **Return** to go back to the menu.

($0A) Emission Related DTC with Permanent Status

This option displays a record of any "permanent" codes. A permanent status DTC is one that was severe enough to illuminate the MIL at some point, but the MIL may not be on at the present time.

Whether the MIL was switched off by clearing codes or because the setting conditions did not repeat after a specified number of drive cycles, a record of the DTC is retained by the ECM. Permanent status codes automatically clear after repairs have been made and the related system monitor runs successfully.

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 difficult to find test connectors.

▶ **To locate a vehicle diagnostic connector:**
1. Select **Connector Information** from the System menu.
    A list of vehicle manufacturers displays.
2. Select a manufacturer from the list.
    A list of models available from the selected manufacturer displays.
3. Select a model from the list.
    If a cable adaptor is needed, which one and how to connect it displays.
4. Select **Continue**.
    Information on where to locate the vehicle diagnostic connector displays.
5. Select **Continue** to return to the System menu.

Manual Protocol Selection

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

- ISO 15765-4 (CAN)
- ISO 27145 (WWHOBD CAN)
- ISO J1939 (CAN)
- 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)

When initially attempting to establish communication with the ECM the diagnostic tool attempts to communicate trying each protocol in order to determine which one is being used. During normal operation the communication protocol is automatically detected. If automatic detection fails, communication protocol can be manually selected.

IMPORTANT:
Using unsupported OBD communication protocols may activate warning lights and can set network related faults. Only use the manual selection option when OBD protocol is already known.

Select **Manual Protocol Selection** to open a menu of options (Figure 5-9).

Figure 5-9 *Manual protocol selection menu*

Select the **Back** icon or press the **N/X** button to return to the OBD-II/EOBD Main menu.

Chapter 6   Previous Vehicles and Data

This chapter describes the basic operation of the Previous Vehicles and Data function.

The **Previous Vehicles and Data** icon is located on the Home screen. This function allows you to select recently tested vehicles and access saved data files.

6.1   Previous Vehicles and Data Menu

The following options are available from the Previous Vehicles and Data menu:

- Vehicle History
- View Saved Data, on page 52,
- Delete Saved Data, on page 55,

6.1.1 Vehicle History

The diagnostic tool stores the identification of the last twenty-five (25) 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-five vehicles on file.

Figure 6-1 *Vehicle history list*

▶ **To select from the vehicle History:**
1. Select **Previous Vehicles and Data** from the Home screen.
2. Select **Vehicle History**.

   A list of up to 25 previously tested vehicles displays. Each vehicle is given a unique file name. Scroll to view the entire list.
3. Select a vehicle from the list.

   A vehicle ID confirmation screen displays.
4. Select **OK** or press the **Y/✓** button to continue.

6.1.2   View Saved Data

Selecting the **View Saved Data** menu option opens a list of all the saved data (movie) files and screen images that are stored in memory. 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.

Figure 6-2 *Saved data list*

Saved files can either be opened directly on the diagnostic tool, or downloaded to a personal computer and opened using ShopStream Connect. See View Saved Data, on page 52, and Connect-to-PC, on page 57, for additional information.

NOTE:
A maximum of fifty (50) files can be displayed on the diagnostic tool. If more than 50 files have been saved, use ShopStream Connect (SSC) to view them all, see Connect-to-PC, on page 57, for additional information.

▶ **To review a saved data file or image:**
1. Select **Previous Vehicles and Data** from the Home screen.
2. Select **View Saved Data**.
3. Select a file to review from the list.

6.2 Viewing Codes and Code Scan Results

When code scan or single system code results are saved, they are saved in (.XML) file format (Figure 6-3).

Figure 6-3 *Typical - Code Results (.XML) file*

The saved (.XML) file(s) can be viewed using these methods:

– On the diagnostic tool - See Viewing Code Results on the Diagnostic Tool, on page 54,.

In report format using:

– ShopStream Connect - see Printing the Code Scan Report, on page 76,.

▶ **Viewing Code Results on the Diagnostic Tool**

Selecting a system code or a code scan results file from your saved file list (Figure 6-4), opens the file onscreen. When opened, the (.XML) file displays basic vehicle information and a list of DTCs with a brief description of each.
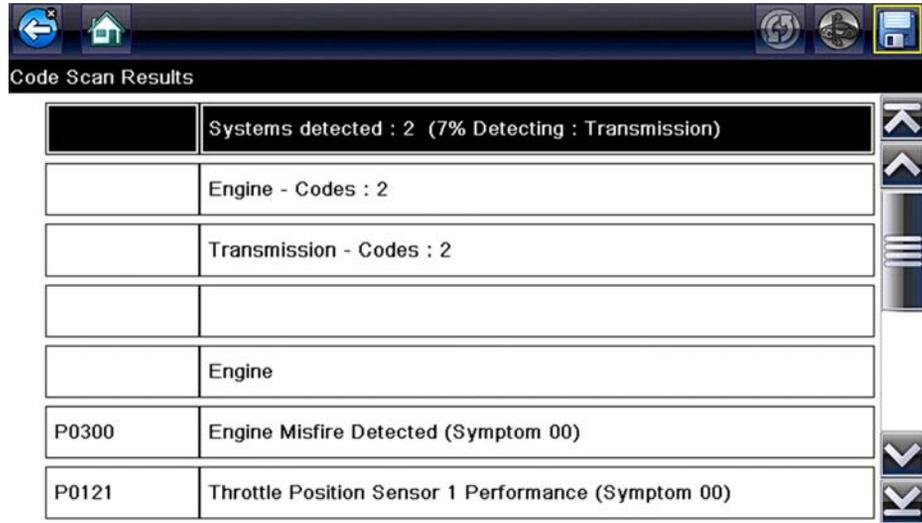
Figure 6-4 *Typical - Code Scan Results (.XML file) viewed onscreen*

6.2.1 Delete Saved Data

This menu option is used to permanently delete saved files from memory.

▶ **To delete a saved file:**

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

    A list of saved files displays.

3. To delete an individual file, select a file from the list (a check mark displays in the checkbox).
4. Select the **Delete** icon (shown left) from the toolbar

A confirmation message displays.

5. Select an option from the confirmation message:
    – **OK**—deletes the selected file and returns to the saved files list, which no longer includes the deleted file.
    – **Cancel**—returns to the saved files list without deleting the selected file.

NOTE:
Use the **Select All/Deselect All** icon (shown left) from the toolbar to quickly delete files.

Tools

This chapter describes the basic operation of the Tools function.

The **Tools** icon is located on the Home screen. This function allows you to configure diagnostic tool settings to your preferences.

7.1 Tools Menu

The following options are available from the Tools menu:

- Connect-to-PC—use to transfer and share files with a personal computer (PC).
- Configure Shortcut Button, on page 58,—use to change the function of the shortcut button.
- System Information, on page 59,—use to view configuration information for the diagnostic tool.
- Settings, on page 59,—use to configure certain characteristics of the diagnostic tool.

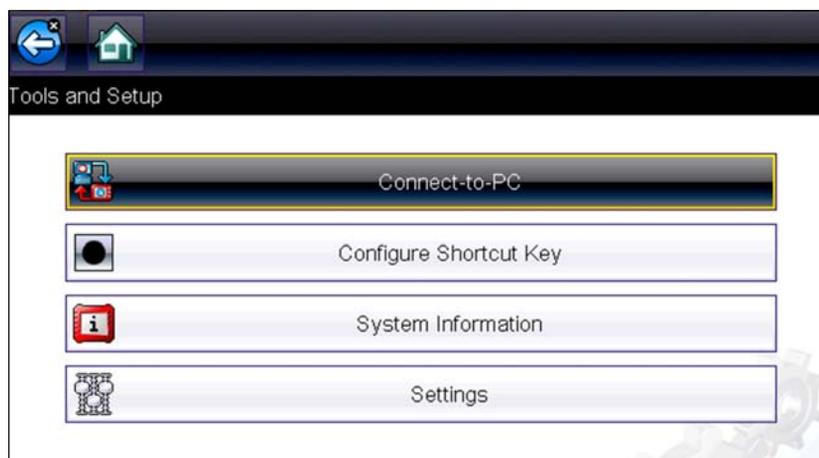**Figure 7-1** *Tools menu*

7.1.1 Connect-to-PC

Connect-to-PC allows you to transfer saved data files on your diagnostic tool to your personal computer using a USB cable.

The optional ShopStream Connect™ PC software allows you to view, print and save data files on your PC. In addition, you can download software updates from the PC to the diagnostic tool. These features provide an ideal way to manage saved data files. The ShopStream Connect application is available free online, see ShopStream Connect, on page 72, for additional information.

▶ **To connect the diagnostic tool to a PC:**

1. Connect the supplied USB cable to the diagnostic tool and then to the PC.

    A USB cable, supplied with your diagnostic tool, is used to connect the diagnostic tool to the PC. When the diagnostic tool is connected to the PC a communications icon appears on the right edge of the title bar.

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

3. Select **Connect-to-PC** from the Tools and Setup menu.

    A screen message will display to confirm the tool is in Connect-to-PC-mode.

Figure 7-2

7.1.2 Configure Shortcut Button

This feature allows you to change the function of the **Shortcut** button. Options are:

- **Brightness**—opens the brightness setting screen.
- **Save Screen**—saves a bitmap image of the visible screen.
- **Save Movie**—writes PID data from buffer memory to a file for future playback.
- **Show Shortcut Menu**—opens the menu so you can quickly select from any of the functions.
- **Toggle Record/Pause**—programs the Shortcut button to work as the Pause and Play icons.

▶ **To assign a function to the Shortcut button:**

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

   The Tools menu opens.

2. Select **Configure Shortcut button** from the menu.

3. Select a function from the menu.

4. Select the **Back** on the toolbar or press the **N/X** button to return to the options menu.

7.1.3 System Information

System Information displays important information such as:

- Patent information
- Software version numbers
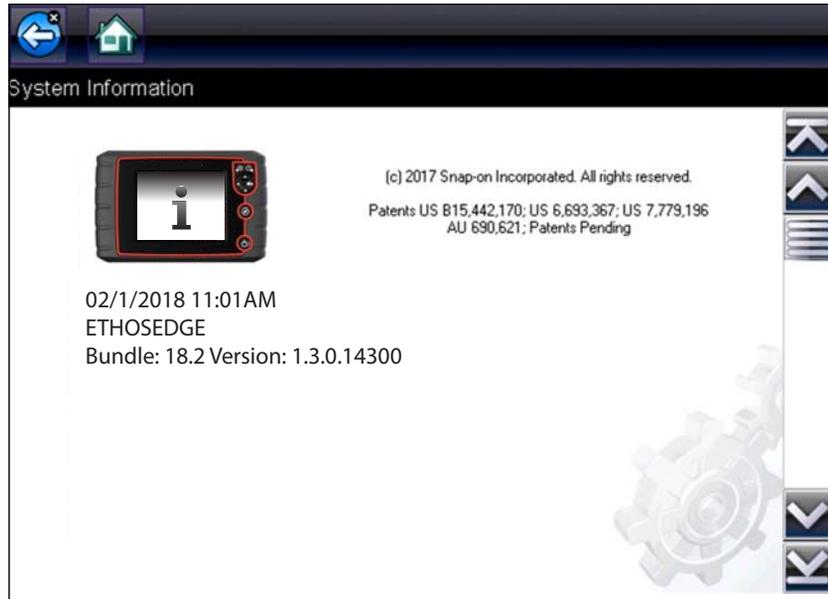- Diagnostic Tool serial number

Figure 7-3 *System information*

▶ **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.
3. Scroll as needed to view all of the data.
4. Select **Back** on the toolbar or press the **N/X** button to return to the options menu.

7.1.4 Settings

This Tools selection allows you to adjust certain basic diagnostic tool functions to your personal preferences. Selecting opens an additional menu that offers the following:

- System Settings - see System Settings, on page 60,
- Configure Scanner - see Configuring Scanner, on page 66,
- Configure Units - see Configure Units, on page 67,

System Settings

Selecting System Settings opens a menu with two options; Display and Date & Time. Either selection opens an additional menu.

Display options include:

- Brightness, on page 60,—adjusts the intensity of the screen back lighting.
- colour Theme, on page 61,—changes the background colour of the screen display.
- High Contrast Toolbar, on page 61,—enhances toolbar graphics for poor lighting conditions.
- Font Type, on page 62,—switches between standard and bold text for better visibility.
- Backlight Time, on page 62,—adjusts how long the screen stays on with an idle diagnostic tool.
- Touch Screen Calibration, on page 63,—calibrates the touch screen display.

Date & Time options include:

- Time Zone, on page 64,—sets the internal clock to the local time standard.
- Clock Settings, on page 64,—sets the time on the internal clock.
- Daylight Savings Time, on page 65,—configures the clock for Daylight Savings Time.
- Time Format, on page 65,—switches the time displays between a 12 or 24 hour clock.
- Date Format, on page 65,—configures how the month, date, and year displays.

Brightness

Selecting this option opens the brightness setting screen for adjusting the back lighting of the display (Figure 7-4).

Figure 7-4 *Brightness setting*

Each push of the **Plus** and **Minus** icons, or the up (▲) and down (▼) arrows, incrementally changes the back lighting up or down respectively.

Select **Back** from the toolbar or press the **N/X** button to exit.

colour 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) and **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 switch to a high contrast toolbar. This toolbar features black and white icons with crisp graphics that are easier to see in poor lighting conditions or bright sunlight.
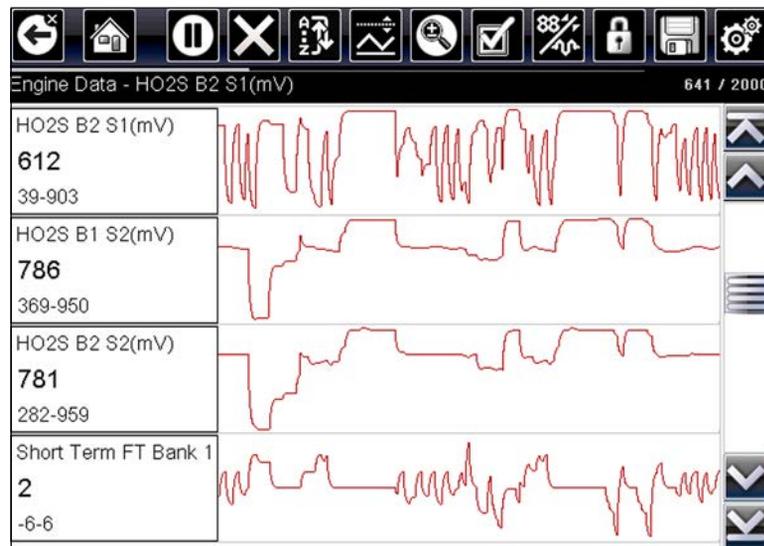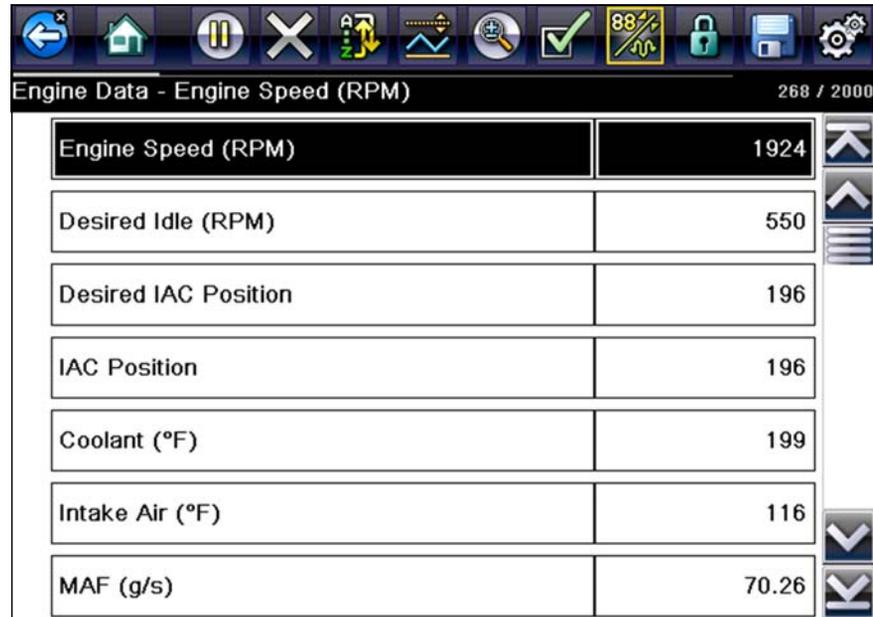

Figure 7-5 *High-contrast toolbar*

Selecting opens a menu with two choices; **Colour Toolbar** and **High Contrast Toolbar**. Select and a "please wait" message displays followed by the Home screen. The new setting is now active.

Font Type

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

Figure 7-6 *Bold type on a black background*

Selecting opens a menu with two choices: Normal Font and Bold Font. Select a menu item or scroll and then press the **Y/✓** button to make a selection. The change is instantaneous. Select the Back or Home icon on the toolbar 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 diagnostic tool is inactive. The following choices are available:

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

Select the menu item desired, or scroll and then press the **Y/✓** button to make a selection. Select **Back** or **Home** on the toolbar to return to either the Settings menu or the Home screen.

Touch Screen Calibration

Calibrating the touch screen maintains the accuracy of the touch-sensitive display.
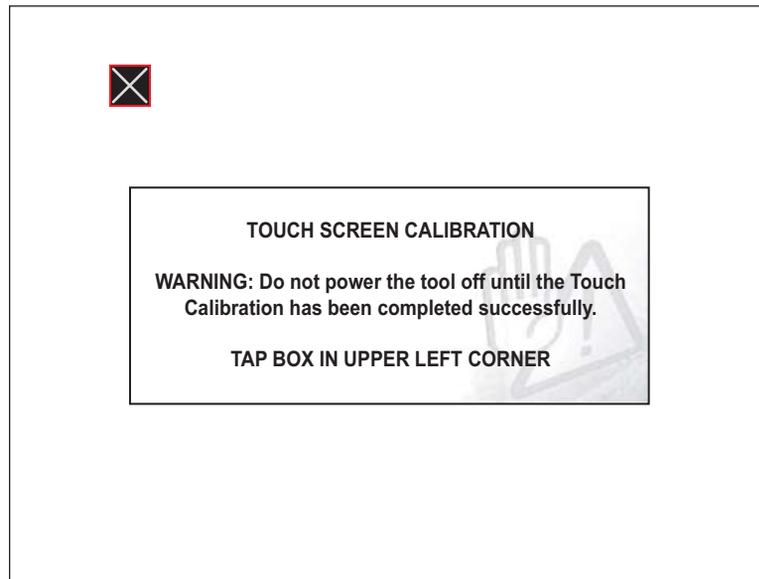
IMPORTANT:
To avoid serious damage to the diagnostic tool, always complete the touch screen calibration sequence once it has begun. **Never turn off the diagnostic tool while a screen calibration is in process.**

▶ **To calibrate the touch screen:**

1. Select **Tools** from the Home screen to open the menu.
2. Select **Settings** from the menu.
3. Select **Touch Calibration** from the menu.

   The calibration screen opens (Figure 7-7).

TOUCH SCREEN CALIBRATION

WARNING: Do not power the tool off until the Touch Calibration has been completed successfully.

TAP BOX IN UPPER LEFT CORNER

Figure 7-7 *Touch screen calibration*

4. Select 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.

IMPORTANT:

A notice that saved files may be overwritten momentarily displays whenever an option that alters the internal clock setting is selected (Figure 7-8). Be sure to transfer any critical files to a PC before continuing with the selected option.
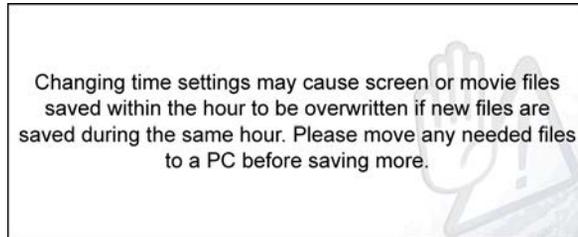

Changing time settings may cause screen or movie files saved within the hour to be overwritten if new files are saved during the same hour. Please move any needed files to a PC before saving more.

Figure 7-8 *Sample possible data loss message*

Clock Settings

This option opens a window for resetting the time on the real-time clock.

▶ **To set the clock:**

1. Select **Tools** from the Home screen to open the menu.
2. Select **Settings** from the menu.
3. Select **Clock Settings** from the menu.

    A warning message briefly displays followed by the Clock Settings screen (Figure 7-9).
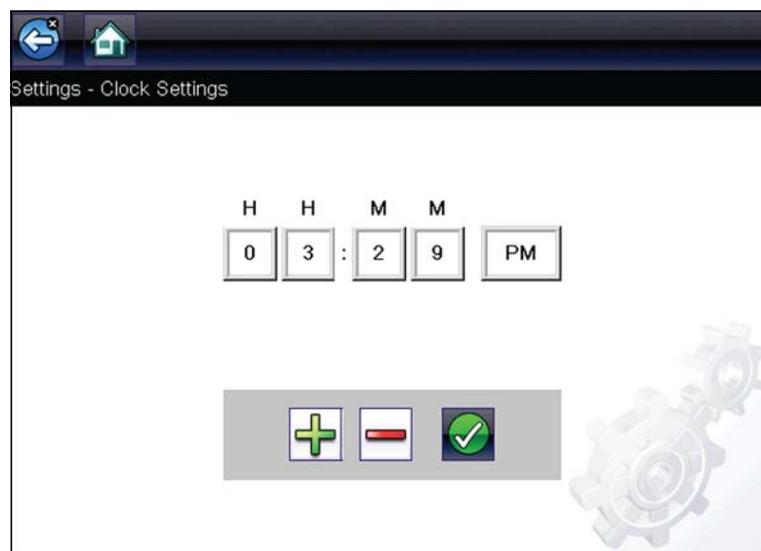

Figure 7-9 *Clock settings*

4. Select the **up** (**+**) icon on the screen or press the **up** (▲) button to incrementally increase the number in the highlighted field. Select the **down** (**–**) icon on the screen or press the down (▼) button to incrementally decrease the number.

5. Select the **check** (✓) icon on the screen or press the **Y/✓** button to move the highlight to the next field.

6. Repeat Step 4 and Step 5 until the correct time is displayed.

7. Select the **Back** icon on the toolbar or press the **N/X** button to close the Clock Settings window and return to the Settings menu.

Daylight Savings Time

This option opens a menu to configure the internal clock for Daylight Savings Time. Choose from:

* **ON**—sets the clock for Daylight Savings time.
* **OFF**—sets the clock for standard time.

Make either selection, then select the **Back** icon or press the **N/X** button to return to the menu.

Time Format

This option determines whether time is displayed on a 12 or 24 hour clock. Selecting opens a menu with two choices:

* **24 Hour Format**
* **12 Hour Format**

Make either selection, then select the **Back** icon or press the **N/X** button to return to the menu.

Date Format

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

* **(MM_DD_YYYY)**—Month, Day, Year
* **(DD_MM_YYYY)**—Day, Month, Year
* **(YYYY_MM_DD)**—Year, Month, Day

Make a selection, then select the **Back** icon or press the **N/X** button to return to the menu.

Configure Wi-Fi

See .

Configuring Scanner

This option allows you to change the scanner display to toggle scales on and off. 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.

Figure 7-10 *Scales hidden*

▶ **To change hide/show scales:**

1. Select **Tools** from the Home screen.
2. Select **Settings** from the Tools and Setup menu.
3. Select **Configure Scanner** from the Settings 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. Select the **Back** icon or press the **N/X** button to return to the Settings menu.

Configure Units

Selecting opens a dialog box that allows you to choose between US customary or metric units of measure for temperature, vehicle speed, air pressure, and other units.

Figure 7-11 *Configure units menu*

▶| **To change the units setup:**

1. Select **Tools** from the Home screen to open the menu.
2. Select **Configure Units** to open the menu.
3. Select an item from the Configure Units menu.
4. Select a setting from the listed choices.
5. Select **Back** on the toolbar or press the **N/X** button to return to the options menu.

Maintenance

This chapter describes basic cleaning and battery replacement procedures for your Diagnostic Tool.

8.1 Cleaning and Inspecting the Diagnostic Tool

Periodically perform the following tasks to keep your Diagnostic Tool in proper working order:

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

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

8.1.1 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.

8.2 Battery Pack Service

Follow all safety guidelines when handling the battery pack.

⚠ **WARNING**

Risk of electric shock.

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

Electric shock can cause injury.

⚠ **WARNING**

Risk of explosion.

- **Use the proper factory battery pack only, incorrect replacement or tampering with the battery pack may cause an explosion.**
Explosion can cause death or serious injury.

8.2.1 Battery Pack Safety Guidelines

IMPORTANT:
The battery pack contains no user serviceable components. Tampering with the battery pack terminals or housing will void the product warranty.

Keep the following in mind when using and handling the battery pack:

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

NOTE:
The battery pack should be used within a short period of time (about 30 days) after charging to prevent loss of capacity due to self-discharging.

If long-term storage of the battery pack is necessary, it should be stored in a in cool, dry, well ventilated place with a 30 to 75 percent state of charge to prevent loss of characteristics.

To prolong the life of your battery, power off the Diagnostic Tool when not in use. The Diagnostic Tool has a built in charger that recharges the battery on demand whenever it is connected to a power source.

8.2.2 Replacing the Battery Pack

If the battery pack no longer holds a charge, contact your sales representative to order a new battery.

IMPORTANT:
Replace the battery pack with original Snap-on replacement parts only.

▶ **To remove the battery pack:**

1. Loosen the battery cover screw, until the battery cover is loose from the housing.
2. Remove the battery pack cover.
3. Pull the bottom edge of the battery pack up then tilt it out to remove.

▶ **To install the battery pack:**

1. Position the battery pack with the arrows (on the battery pack) facing up.
2. Tilt the top of the battery pack in to align the tabs, then down to install into place.
3. Install the battery pack cover, in the opposite manner as removal, aligning the tabs and tilting down and in into place.
4. Tighten the battery pack cover screw.

▲ This side up. ▲
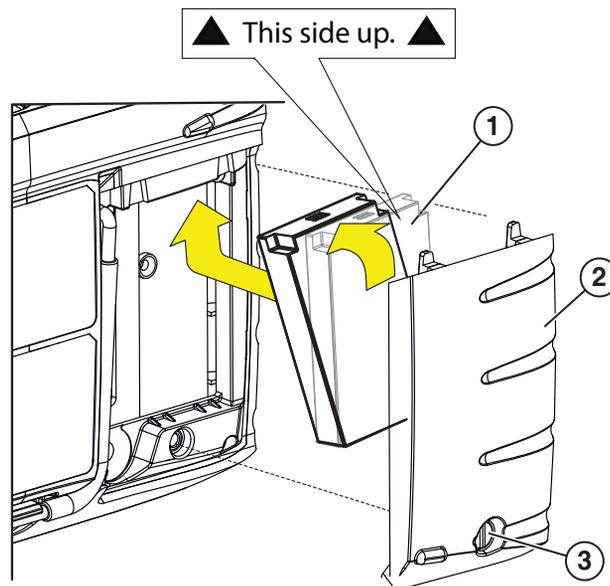
1— **Battery Pack**
2— **Battery Pack Cover**
3— **Battery Pack Cover Screw**

Figure 8-1

8.2.3 Disposing of the Battery Pack

Always dispose of the battery pack according to local regulations, which vary for different countries and regions. The battery pack, while non-hazardous waste, does contain recyclable materials. If shipping is required, ship the battery pack to a recycling facility in accordance with local, national, and international regulations. For additional information contact:

- **United Kingdom**—Electrical Waste Recycling Company at http://www.electricalwaste.com

Products bearing the WEEE logo (Figure 8-2) are subject to European Union regulations.

Figure 8-2 *WEEE logo*

NOTE:
Always dispose of materials according to local regulations.

Contact your sales representative for details.

ShopStream Connect

This chapter includes a brief introduction to some of the key features of the ShopStream Connect software. For detailed ShopStream Connect information and instructions, download the ShopStream Connect User Manual from our website:
https://www.snapon.com/diagnostics/uk/User-Manuals.htm

The ShopStream Connect™ **(SSC)** software is PC-based software that extends the capabilities of your diagnostic tool. Using ShopStream Connect software with your diagnostic tool allows you to do the following:

- View, Print, and Manage data saved from your Diagnostic tool.
- Move and copy your data between the diagnostic tool and your PC.
- View and Print trouble codes saved with select diagnostic tools. This allows you to share the data in a report format with vehicle owners or other technicians.
- Add or edit notes and comments to diagnostic tool data files.
- Download and install diagnostic tool software updates and upgrades.

The ShopStream Connect (SSC) software is available (free of charge) at:

ShopStream Connect -
https://www.snapon.com/diagnostics/UK/Diagnostics/ShopStreamConnect.htm

9.1 Using SSC (Connecting to your PC)

▶ **To connect and use SSC with your diagnostic tool:**

1. Download and install SSC on your PC from:
   https://www.snapon.com/diagnostics/UK/Diagnostics/ShopStreamConnect.htm
2. Turn your diagnostic tool on.
3. Connect the supplied USB cable from the USB jack on your diagnostic tool to your PC:
4. From the diagnostic tool Home screen, select **Tools > Connect-to-PC**.

The **"Device is now in Connect-to-PC mode"** screen message is displayed (Figure 9-1) and the ShopStream Connect software will open automatically on your PC (Figure 9-2).
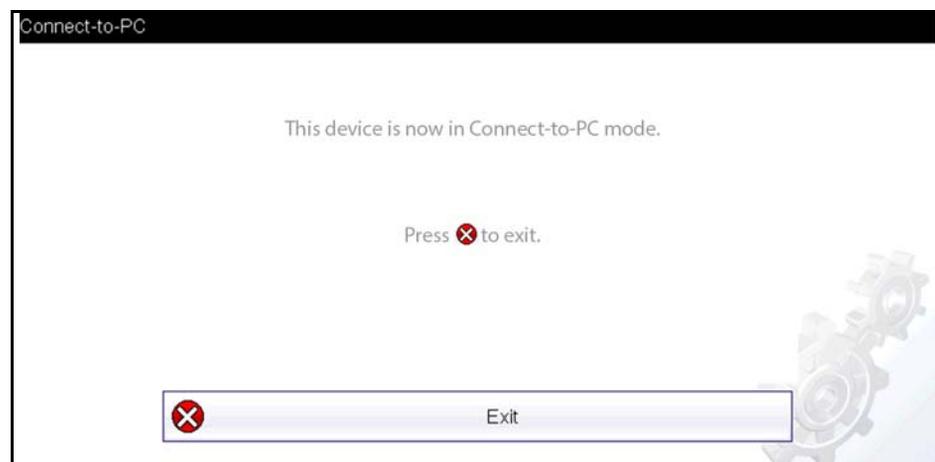

Figure 9-1

If the ShopStream Connect software does not open, open it from the Windows Start menu or use the ShopStream Connect shortcut icon on the Windows desktop (automatically created during installation).

9.2   SSC Main Screen

The ShopStream Connect software will open automatically when you connect the diagnostic tool to your PC USB connection, Using SSC (Connecting to your PC), on page 72,.

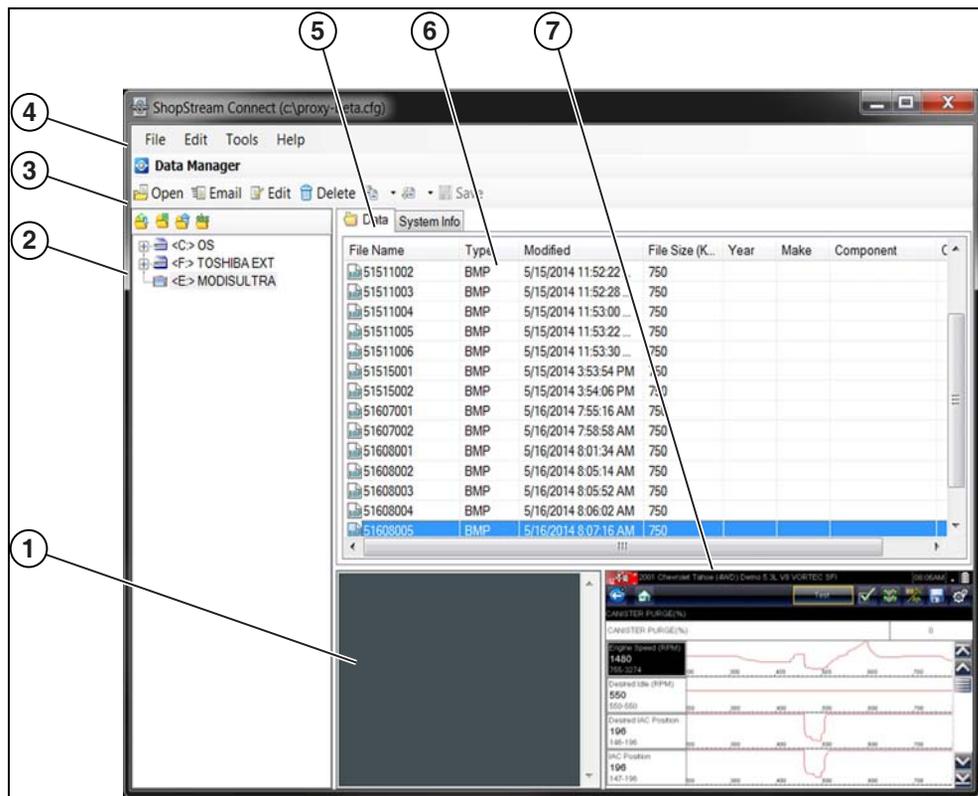The following shows the main screen layout for ShopStream Connect software.

Figure 9-2

1— Notes Window—allows you add notes to select data files. Select Save from the menu bar to save your notes. *NOTE: Not all file types allow notes, the Notes window will be grayed out when a file type that does not support notes is highlighted. Some image files may display notes for reference purposes (the notes are grayed out and not editable).*

2— File directory structure—displays the file directory structure of your PC in standard Windows format, and shows any connected diagnostic tools at the bottom of the data list.

3— Data Manager Toolbar—provides control icons that perform a variety of operations on data files.

4— Main Menu bar—contains **File, Edit**, **Tools**, and **Help** menus.

5— Tabs—provides access to data files and presets stored on the diagnostic tool or on the PC, and also allows viewing of software revision details of the diagnostic tool.

6— Main display—shows stored data files details. *NOTE: The files listed are sortable (ascending/descending) by clicking on the column tab at the top (e.g. File Name, Type, etc.) Sort preferences are saved when the ShopStream Connect program is closed.*

7— Preview—displays a sample of the file if the selected file is a image file.

9.3 Scanner DataViewer

SSC allows you to view data files recorded with your diagnostic tool, on your PC. When a Scanner data file is selected, it opens and displays in the Scanner DataViewer (Figure 9-3). Scanner DataViewer allows you play the data file and custom configure the data in a number of ways.
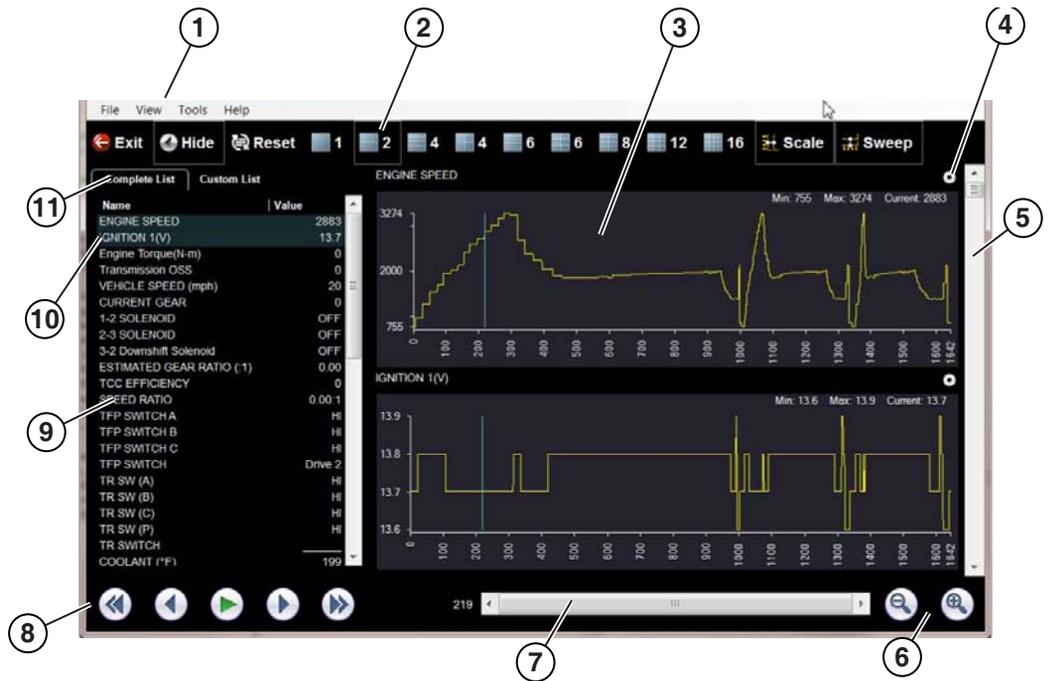
1— Menu bar	6— Zoom controls
2— Display toolbar	7— Slider bar
3— Graph display	8— Navigation toolbar
4— Properties icon	9— Parameter text list
5— Vertical Scroll bar	10—**Highlighted PIDs -** indicates graphs currently displayed
	11—**Parameter configuration tabs**

Figure 9-3

9.4   Image Viewer

SSC allows you to view and print .bmp, .jpg and .sps image files (screenshots) saved on your diagnostic tool, with your PC.

NOTE:
File extension types vary depending on the diagnostic tool. Not all the file extensions described here may be available on your diagnostic tool.

1— **Exit** - closes the Image Viewer

2— **Print** - prints the image

3— **Print Preview** - allows the image to be previewed before printing

4— **Captured Screen Image**

Figure 9-4

9.5 Printing the Code Scan Report

To print the Code Scan Report, the saved code scan .XML file must be opened using ShopStream Connect.

To print the Code Scan Report using ShopStream Connect:

1. Double-click the code scan .XML file from the file list to open the report (Figure 9-5) in the Code Scan Viewer (Figure 9-6).
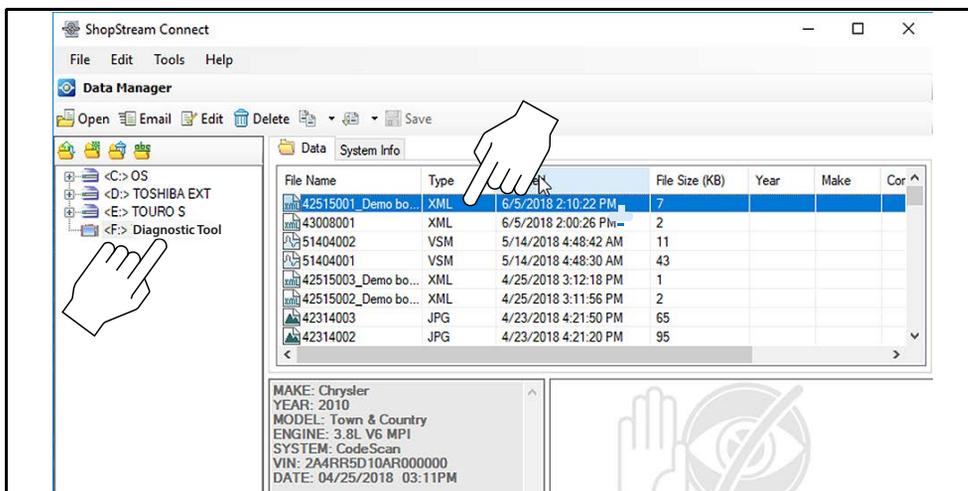

Figure 9-5

2. Select **Print** or **Print Preview** from the Code Scan Viewer menu to print or preview the report (Figure 9-6).
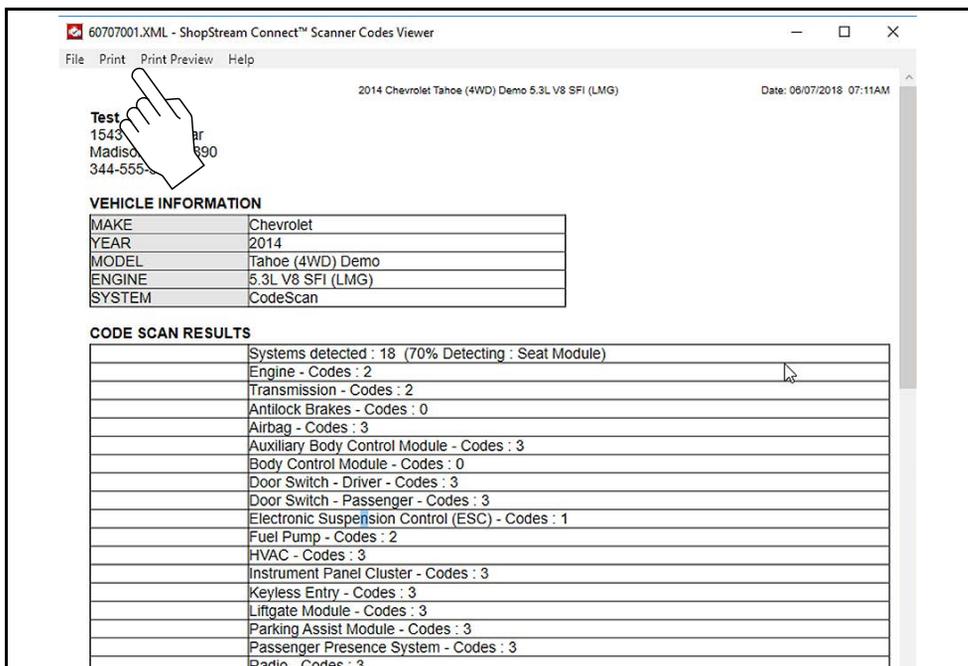

Figure 9-6

Selecting **Print** opens the Windows print dialog window ([Figure 9-7](#)). Select your printer from the list, then select **Print** to print the report.
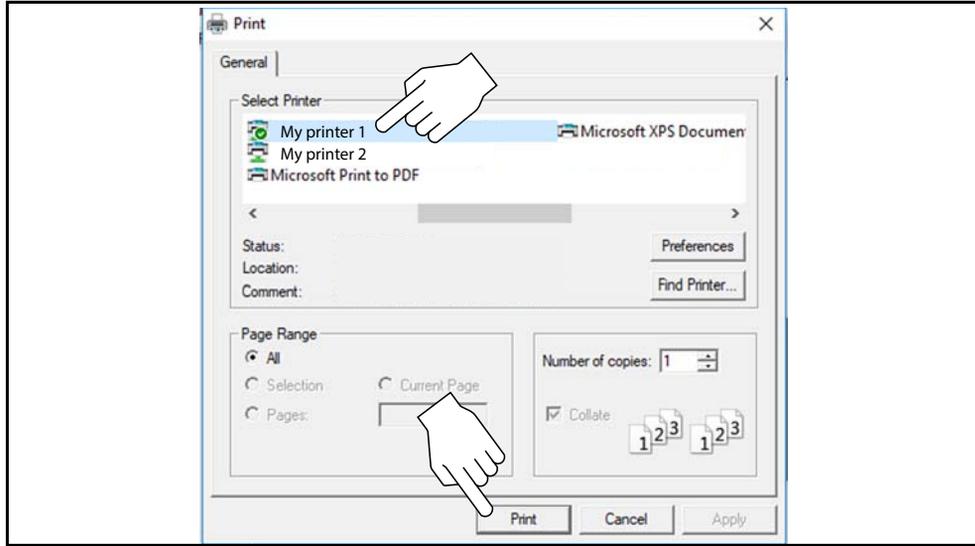
Figure 9-7

9.6 Software Upgrades and Updates

Upgrade/Update Descriptions:

- **Software Upgrade** - a software upgrade is a new software version (contact your sales representative for purchase information).
- **Software Update** - a software update is a service release for installed software. These are available free of charge, and are provided as necessary to update installed software. When your diagnostic tool is connected to a PC using SSC, the SSC software will automatically check for updates, and if an update is available, it will provide installation instructions. Follow the screen prompts to accept, download and install the software.

NOTE:
To receive updates or upgrades, SSC software must be installed on your PC and have connection to the Internet.

Example - Updating diagnostic tool software:

1. Select **Tools** > **Update Software** > (**diagnostic tool type - e.g. ETHOS Edge, MODIS Edge, SOLUS Edge, etc.)** from the Menu bar (Figure 9-8).

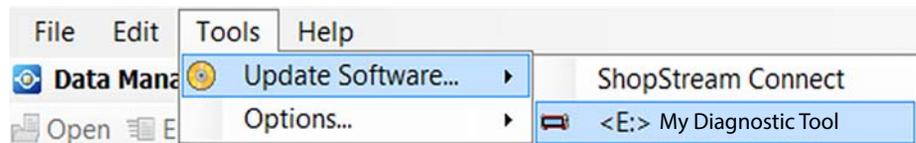   The software checks the Snap-on web server for available updates.

Figure 9-8

2. If service release updates are available, select **Next** to continue, then select **Download** and follow the on-screen instructions to complete the installation (Figure 9-9).

Figure 9-9

NOTE:
For additional information on ShopStream Connect software updates and upgrades, download the ShopStream Connect User Manual from our website:
https://www.snapon.com/diagnostics/uk/User-Manuals.htm

9.6.1 End User License Agreement

Before software installation at initial purchase, and before all subsequent software updates/upgrades installations End User License Agreement (EULA) acceptance is required.

IMPORTANT:
Use of Software is governed by the terms and conditions of the End User License Agreement. The diagnostic tool should not be initially operated until the End User License Agreement is read. Use of the device acknowledges your acceptance of the End User License Agreement. The Snap-on Incorporated Software End User License Agreement is available at:
https://eula.snapon.com/diagnostics

To Accept: at the screen prompt (Figure 9-10) click the checkbox on the left side of the window, and then select **Agree and Continue**. The software will be installed automatically.

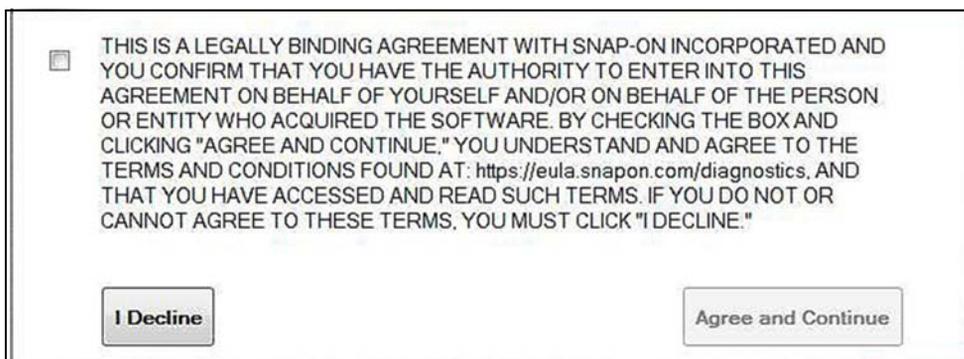Figure 9-10 below represents a typical EULA acceptance agreement screen.

Figure 9-10 *Typical EULA acceptance screen*

To Decline: at the screen prompt (Figure 9-10) select **I Decline**. A confirmation message is displayed providing options to Go Back or Exit the software installation (Figure 9-11).
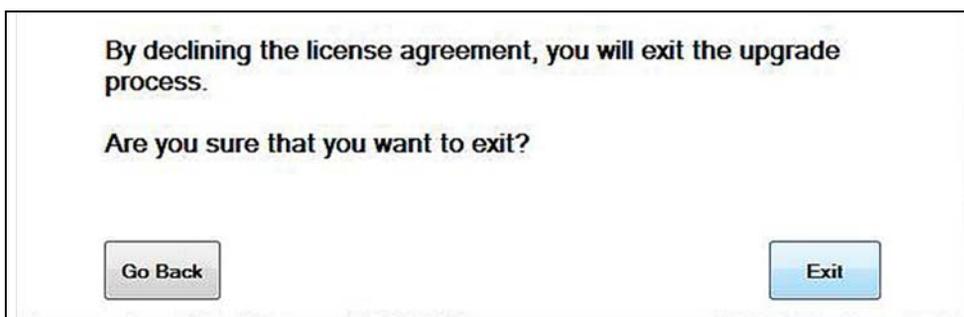

Figure 9-11 *Typical EULA acceptance screen*

Wi-Fi Connection / Troubleshooting

The diagnostic tool is equipped with the ability to connect to a Wi-Fi network, however the connection is solely dedicated to the Snap-on Web Services Network.

Connecting to Wi-Fi allows the tool to receive important messages from Snap-on, and if applicable connect to information services.

This section includes information on Wi-Fi connection and troubleshooting.

Main Topic Links

10.1 Checking if Wi-Fi is On/Off

If the Wi-Fi indicator is displayed in the title bar, Wi-Fi is on. If Wi-Fi is off, see T*urning On Wi-Fi and Connecting to a Network* to turn it on and connect.
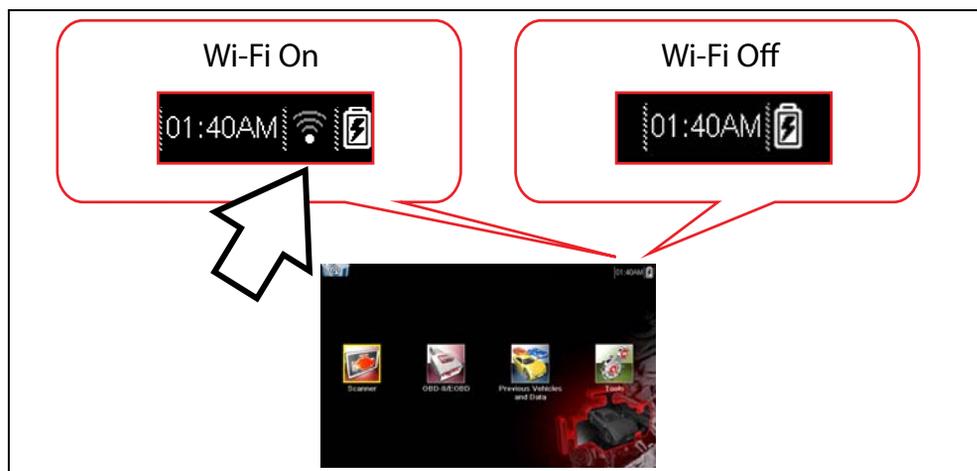
10.2 Checking if Wi-Fi is Connected

Check the Wi-Fi indicator in the title bar:

	Wi-Fi is on and connected to a network (1 to 3 bars).
	Wi-Fi is on, but not connected (zero bars). See Wi-Fi Troubleshooting and Status Messages, on page 85,.

10.3 Wi-Fi Icons (Setup)

Familiarize yourself with the following Wi-Fi icons and indicators from the Wi-Fi configuration screen.

Wi-Fi Icon (toggle type)		Wi-Fi Test Icon	Wi-Fi Signal Strength Indicator	
Select to turn Wi-Fi ON	Select to turn Wi-Fi OFF	Select to open the Wi-Fi Test screen	Zero bars indicates no signal	Three bars indicate full strength signal
Displayed on Wi-Fi configuration screen only			Displayed on the title bar next to the battery level indicator	

10.4 Turning Wi-Fi On and Connecting to a Network

1. From the Home screen, select **Tools > Settings > Configure Wi-Fi**.
2. Select the **Wi-Fi** icon (with checkmark) (Figure 10-1) to turn Wi-Fi on.

Figure 10-1 *Wi-Fi Icon (shown off)*

3. The Wi-Fi icon will change to the Wi-Fi symbol with "x" mark (Figure 10-2), indicating Wi-Fi is on.

The screen will change to display available supported network connections.

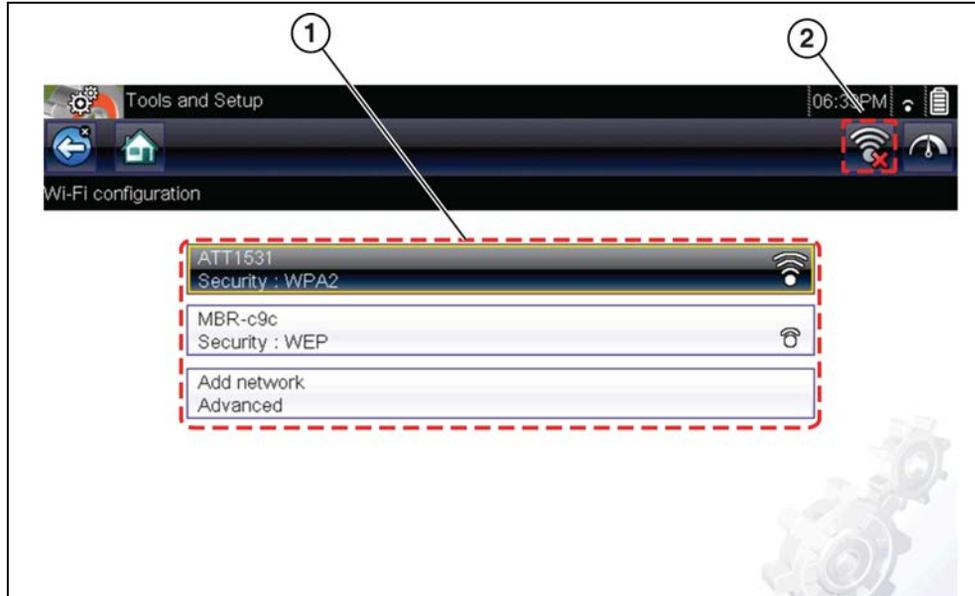4. Select your network. Use the scroll feature to show all active connections (Figure 10-2).

Figure 10-2 *Wi-Fi Configuration Screen*

1— Available Network Connections

2— Wi-Fi Icon (Wi-Fi shown on)

NOTE:
A password is required when choosing a secured (protected) network. Enter the password using the on-screen keyboard and then select the check mark on the keyboard to continue.

Networks with a proxy, challenge page, or that require the user to accept terms of usage are not supported.

Wi-Fi performance varies depending on your wireless network equipment and ISP.

5. Select **Connect** to connect to your desired network or **Cancel** to cancel the request.

6. From the Connect confirmation screen select **OK** to continue using this connection or **Forget** to disconnect this connection.

   • If the status message "Not Connected" is displayed, retry the configuration process or see Wi-Fi Testing, on page 83 for additional information.

10.5   Add Network Advanced (Connecting to a hidden network)

The Add Network selection allows you to connect to a network that is not broadcasting its name (not visible in the displayed network list). These networks are also known as "hidden" networks.

To connect to a hidden network you will first need to know the following:

- Network Security Type
  - Open (only need SSID)
  - WPA or WPA2 (Pre-shared key)
  - WEP (WEP key)
- Network name or SSID (Service Set Identifier)
- Network Password

▶ **Connecting to a Hidden Wi-Fi Network**

1. From the Home screen, navigate to **Tools > Settings > Configure Wi-Fi**.
2. Select **Add Network Advanced** from the network list (scroll to end of list).
3. Select security type Open, WPA, WPA2, or WEP. Refer to the router user manual or your IT administrator to determine the type.
4. Enter the network name or SSID
5. Enter the network password.
6. Select **Connect** at the prompt to connect to the network.
7. Select **OK** at the confirmation screen to continue using this connection, or Forget to disconnect this connection.

10.6   Wi-Fi Testing

If you are experiencing network connection issues, an automated testing feature is available to quickly test your network connection.

▶ **Testing Connections**

1. Before you start the automated testing procedure, turn off the diagnostic tool and then turn it on. This clears previous testing messages from memory.
2. Connect to your desired network, see Turning Wi-Fi On and Connecting to a Network, on page 81.
3. From the Wi-Fi configuration screen, select the **Wi-Fi Test** icon to open the network connection test screen (Figure 10-3).

Figure 10-3 *Wi-Fi Test Icon*

The network connection test is an automated test that begins when the screen is displayed. Network connection systems are tested in sequence and display a status indicator (Red = test failed, Yellow = test is process, or Green = test completed satisfactorily) when finished (Figure 10-4).

Connectivity of the following systems are checked:

- **Hardware**
- **Router**
- **Internet**
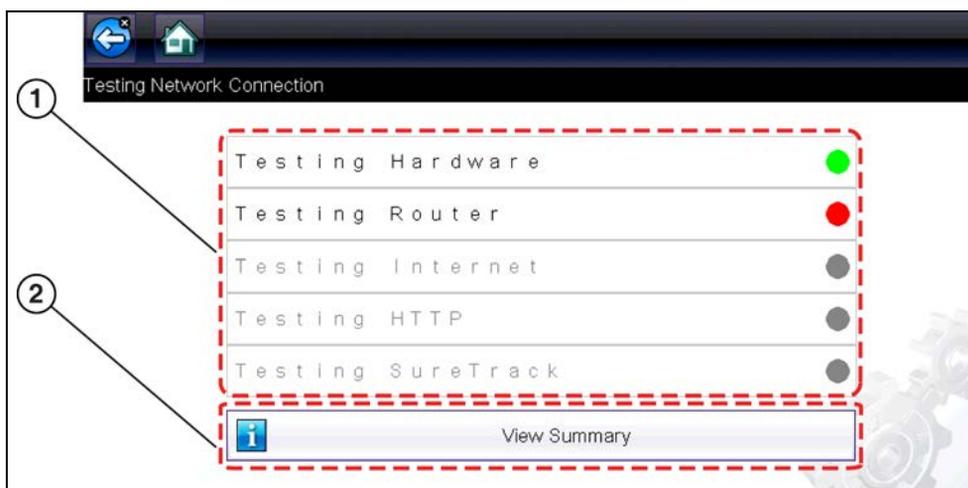- **HTTP**
- **Web Services Network**

Figure 10-4 *Connection Tests*

1— Connection Tests

2— View Summary

4. If a connection issue(s) is present, select **View Summary** to review the results. The summary information is helpful if you are experiencing difficulties with your connection (Figure 10-5). Scroll through the summary information to review the test results for each system and Tip messages for the current connection issue. See *Connection Tests - Troubleshooting* chart in Wi-Fi Troubleshooting and Status Messages, on page 85 for additional information.

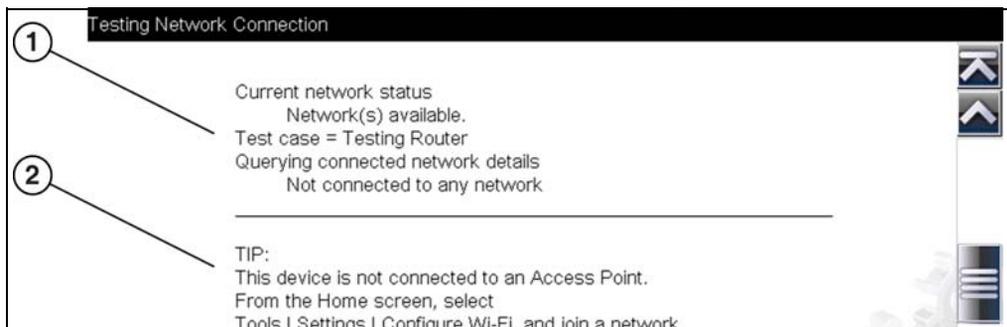**Figure 10-5** *View Summary*

1— Connection Test Results

2— Connection Issue Tip Message

10.7 Wi-Fi Troubleshooting and Status Messages

The following troubleshooting information is not inclusive and is meant as a guide only. Other issues and solutions may arise that are not stated here. The following description of terms are provided for reference as used in the following troubleshooting chart:

- **Router -** The data transmission device directly connected to your ISP.
- **Remote Wireless Access Point -** A wireless connection device between the router and your diagnostic tool.
- **Wi-Fi Radio -** The internal diagnostic tool radio transmitting and receiving Wi-Fi signals.
- **Network Connection -** Also called Wi-Fi connection. The configured Wi-Fi router connection the diagnostic tool connects to. This connection can be secured (password protected) or unsecured (open).

Router Information

Router compatibility and setup are important factors to check when trying to determine connectivity problems. Although we have tested this device at the factory to verify connectivity, we cannot guaranty its connectivity with your specific equipment. There may be some situations that require your time for router connection troubleshooting and/or additional consultation and equipment. Snap-on Incorporated is not responsible for any costs incurred for any additional equipment, labor or consultation charges or any other costs that may result from correcting non-connectivity issues with this device.

Check Router Settings

Verify the following router settings **BEFORE** you begin troubleshooting a non-connectivity or "No Connection" problem. After each check, make any corrections as necessary then retest for connectivity. ***Contact your IT administrator or ISP for assistance.***

1. Check your router connection and if applicable, the remote wireless access point connection.
2. Clear saved Wi-Fi networks, see Clearing Wi-Fi Networks, on page 85,.
3. Verify:
    (a). Router is configured to use Dynamic Host Configuration Protocol (DHCP), not a static IP address.

    (b). Router and/or settings for this device are configured to 2.4GHz. 5GHz is not supported.

    (c). Router is configured to B/G and/or N standard wireless networks to 2.4GHz. 5GHz is not supported. See your router "User Guide" for setup, connection and troubleshooting procedures.

4. Check for router firmware and update to current version, if applicable.
5. Restart or reset the router. See your router "User Guide" for procedures.
6. Connect to a different router.

Clearing Wi-Fi Networks

1. Select the Wi-Fi network that you are trying to connect to from the list of saved networks on the Wi-Fi configuration menu.

    The Wi-Fi Summary page displays.
2. Select **FORGET**

    The Wi-Fi Configuration menu displays.

3. Repeat steps (1) and (2) for ALL saved Wi-Fi networks.

4. Once all saved Wi-Fi networks have been deleted (forgotten) turn off the diagnostic tool.

5. Turn on the diagnostic tool and connect to the desired Wi-Fi network, see .

General -Troubleshooting		
Problem	**Possible Cause**	**Corrective Action**
Not receiving messages, or (if applicable) Information Services are not available	Access has expired	Contact your sales representative.
	Access may be temporarily unavailable	Try accessing at a later time as updates to the service may be in process.
	Wi-Fi radio is turned Off	1. From the Home screen, navigate to **Tools > Settings > Configure Wi-Fi.** 2. Select the **Wi-Fi** icon and turn the Wi-Fi radio on. The Wi-Fi icon will change from a green check mark icon to red "X" mark icon indicating Wi-Fi radio is on. 3. Connect to a known good network.
	Not connecting to a network	1. Clear saved Wi-Fi networks, see Clearing Wi-Fi Networks, on page 85,. 2. Connect to a network. 3. From the Configure Wi-Fi screen select the **Wi-Fi Test** icon and review the results. See ***Connection Tests - Troubleshooting*** *in the following table*.
Wi-Fi connection drops off or disconnects intermittently	Wi-Fi Signal strength insufficient	Check Wi-Fi signal strength - out of range or interference. Move closer (within 50 Ft. (15 M) or into a direct open sight-line of the router or if applicable, remote wireless access point. Eliminate interference from overhead lights, windows, walls, other wireless devices, metal objects and devices that emit electrostatic discharge.
	Router overloaded	Disconnect/disable other Wi-Fi devices connected to the router.

Connection Tests - Troubleshooting		
Failed Test	**Possible Cause (Displayed Tip Message*)**	**Corrective Action / Checks**
Hardware	Wi-Fi radio not responding and/or will not turn off	Contact Customer Support for assistance.
	Wi-Fi radio not responding and/or will not initialize	
	Missing or corrupt firmware file(s)	

Router	This device is not connected to a router	Check Wi-Fi signal strength - out of range or interference. Move closer (within 50 Ft. (15 M) or into a direct open sight-line of the router or if applicable, remote wireless access point. Eliminate interference from overhead lights, windows, walls, other wireless devices, metal objects and devices that emit electrostatic discharge.
		Check router connection and setup. See Check Router Settings, on page 85, for procedure.
Internet	This device is not connected to the Internet or has no DNS	Check router connection and setup. See Check Router Settings, on page 85, for procedure.
		Domain Name System (DNS) server not connected. Contact your Internet service provider (ISP).
HTTP	This device cannot communicate using HTTP	Check if your Internet access uses a "Proxy" or "Accepting terms in a browser" protocol, or uses a challenge page. These protocols are not supported by this device. Contact your IT administrator or ISP for options.
Web Services (variable)	Your access has expired	Contact your sales representative.
	Web Services may be temporarily unavailable or Not connecting to a network	Try accessing at a later time as updates to the service may be in process.
		Check router connection and setup. See Check Router Settings, on page 85, for procedure.

* See *Wi-Fi Testing*, on page 83, for additional information.

10.7.1 Informative Messages

Messages may be displayed to inform you of pending issues or general status. Depending on your access and connection status, the following are typical messages that may be displayed:

- **Content May Be Available! -** indicates content may be available, however you are not currently connected to the Web Services Network. This message may be caused by a Wi-Fi connection issue, or you do not have access to the feature. See Wi-Fi Troubleshooting and Status Messages, on page 85, for Troubleshooting information.

- **No connection. Please try again later. -** indicates you are not currently connected to the Web Services Network. If this message is displayed in the Scanner function, it may be caused by a Wi-Fi connection issue, or you do not have access to the feature. See Wi-Fi Troubleshooting and Status Messages, on page 85, for Troubleshooting information.

- **Loading content -** indicates information is being accessed from the Web Services Network.

- **A new diagnostic software upgrade is available. Contact your sales representative for details.**

- **Your access has expired. See your Sales representative to renew. -** indicates your access to the Web Services Network has expired and you should contact your sales representative.