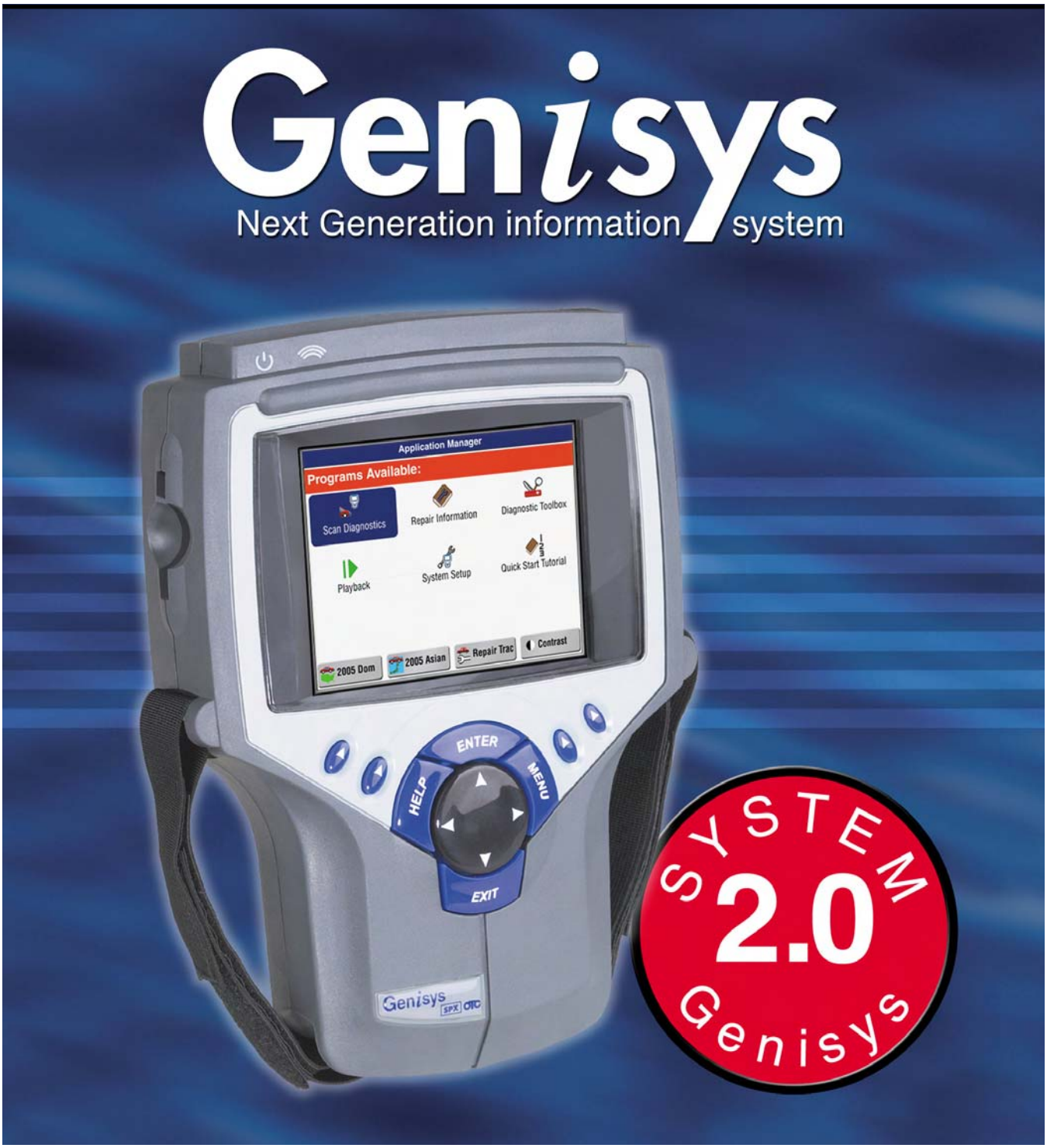
Genisys User Guide



IMPORTANT NOTICES

SAFETY DEFINITIONS

Follow all DANGER, WARNING, IMPORTANT, and Note messages in this manual. These safety messages are defined and formatted as follows:

DANGER or WARNING: Means you risk bodily harm and /or possible loss of life.

IMPORTANT: Means the information demands special attention or that you risk damage to the vehicle or the tool.

NOTE: *Provide clarity and helpful tips.*

The safety messages cover situations SPX is aware of. SPX cannot know, evaluate or advise you as to all of the possible hazards. You must be certain that any conditions or service procedures encountered do not jeopardize your personal safety.

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DISCLAIMER

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All software screens shown in this manual are examples. Actual test screens vary for each vehicle being tested.

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Safety Precautions

DANGER: When an engine is operating, keep the service area WELL VENTILATED or attach a building exhaust removal system to the engine exhaust system. Engines produce carbon monoxide, an odorless, poisonous gas that causes slower reaction time and can lead to serious personal injury or loss of life.

WARNINGS:

- **When working with hydraulic or fuel lines, liquids under pressure may escape and create a dangerous condition. Use adequate ventilation and make sure there are no sparks or possibility of sparks present that may ignite any vapor.**

- **Wear an American National Standards Institute (ANSI) approved eye shield when testing or repairing vehicles. Objects propelled by whirling engine components or pressurized liquids escaping may cause personal injury.**

- **Set the parking brake and block the wheels before testing or repairing a vehicle. It is especially important to block the wheels on front-wheel drive vehicles because the parking brake does not hold the drive wheels.**

- **Do not drive the vehicle and operate the scan tool at the same time. Any distractions may cause an accident. Have one person operate the scan tool as another person drives the vehicle.**
- **Maintain adequate clearance around moving components or belts during testing. Moving components and belts can catch loose clothing, body parts, or test equipment and cause serious damage or personal injury.**

- **Automotive batteries contain sulfuric acid and produce explosive gases that can result in serious injury. To prevent ignition of gases, keep lit cigarettes, sparks, flames, and other ignition sources away from the battery at all times.**

- **Refer to the service manual for the vehicle being serviced and adhere to all diagnostic procedures and precautions. Failure to do so could result in personal injury or otherwise unneeded repairs.**

- **Use only specially designed replacement parts (brake hoses and lines) for ABS-equipped vehicles.**
- **After bleeding the brake system, check the brake pedal for excessive travel or a “spongy” feel. Bleed again if either condition is present.**

- **When installing transmitting devices (Citizen Band radio, telephone, etc.) on ABS-equipped vehicles, do not locate the antenna near the ABS control unit or any other control unit.**

IMPORTANTS:

- **To avoid damaging the scan tool or generating false data, make sure the vehicle battery is fully charged and the connection to the vehicle DLC is clean and secure.**
- **Do not place the scan tool on the distributor of a vehicle. Strong electro-magnetic interference can damage the scan tool .**
- **Never disconnect or reconnect any electrical connector while the ignition is on. Control unit damage may result.**

1: General Information

Introduction

The Genisys scan tool is an easy-to-use tool for reading information from a vehicle's electronic control units.

The scan tool has an memory card that contains the operating system and software applications. With the tool properly connected to a vehicle's data link connector (DLC), you can use the tool to read diagnostic trouble codes and view "live" data readings from the vehicle's ECUs. You can save "recordings" of the data readings, print information, and perform special device control tests on the vehicle.

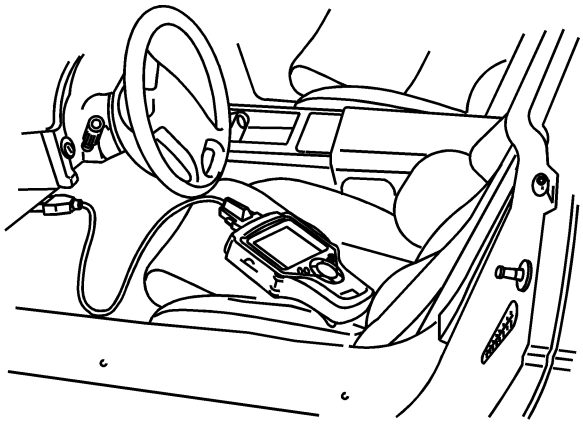


Figure 1.1: Scan Tool Connected to Vehicle DLC

In addition, the scan tool contains several software applications that let you look up repair information without being connected to a vehicle.

When you turn the scan tool on, the Application Manager screen displays icons (or a menu) for selecting the software applications in the scan tool as shown and described below.

NOTE: *You can change the screen to display either icons or a menu as shown below. For details, refer to* ***User Interface Selection*** *on page 73.*

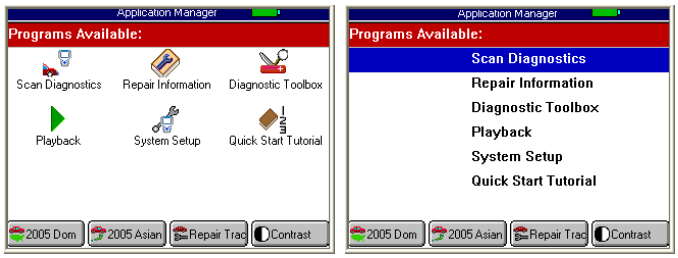


Figure 1.2: Application Manager Screen Examples

- **Scan Diagnostics** - this option leads to the vehicle diagnostic software applications: **Domestic, Asian, ABS/ Air Bag, European, Latin America, Global OBD II, GM SPS Reprogramming,** and **Cartridge Reader Module**.
- **Repair Information** - this option leads to the repair information software applications: **Repair-Trac Fast Fixes, Code Library,** and **InfoTech**.
- **Diagnostic Toolbox** - this option leads to the specialized diagnostic software applications: **Remote Display, Scope Multimeter, Scope with InfoTech, Gas M-P,** and **ConnecTech**.
- **Playback** - leads to a screen for viewing saved data recordings.
- **System Setup** - leads to screens for adjusting default scan tool settings and viewing system information.
- **Quick Start Tutorial** - for viewing an overview of how to use the scan tool keys and screens.
- **Function Keys** - four function keys at the bottom of the screen are for quick access to applications that you use frequently.

For more information about these software applications, refer to **Software Descriptions** on page 6.

Component Descriptions

Genisys Scan Tool

Front View

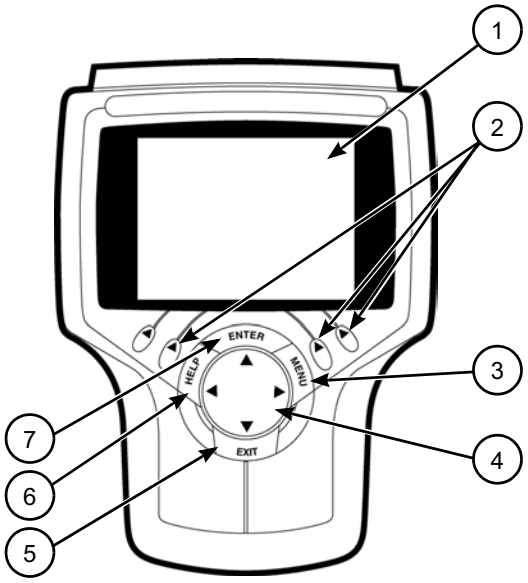


Figure 1.3: Scan Tool Front View

1 **LCD Screen** — displays the menus and data screens. (Also displays a battery charge level indicator at the top of the screen when the scan tool is turned on.)

2 **Variable Function Keys** — four keys that correspond with "buttons" on some screens; execute special commands.

3 **MENU Key** — provides quick access to the Global OBD II application if held down while turning the scan tool on.

4 **Direction Keys (Up, Down, Left, and Right)** — select an option or scroll through a screen of data or text.

5 **EXIT Key** — exits a screen and generally displays the previous screen.

6 **HELP Key** — displays helpful information.

7 **ENTER Key** — executes a selected option and generally displays the next screen.

Back View

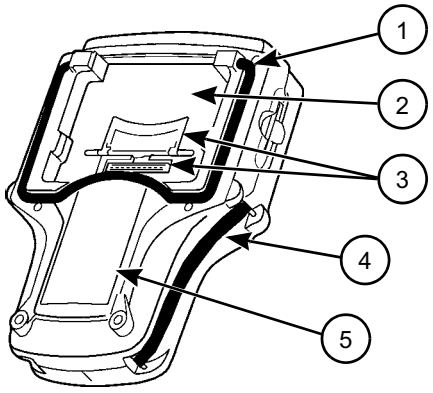


Figure 1.4: Scan Tool Back View

1 **Stand** — flips out for setting the scan tool in an upright position.

2 **Add-On Module Compartment** — holds an add-on hardware module such as the Cartridge Reader, Scope, and Gas M-P modules.

3 **Hardware Interface Port (HIP) with access door** — with door open, provides communication between the scan tool and a connected hardware module.

4 **Security Straps (one on each side)** — fit around hands for easier use and to protect against dropping.

5 **Battery Compartment and Cover** — holds a rechargable nickel metal hydrate (NiMH) battery pack.

Top View

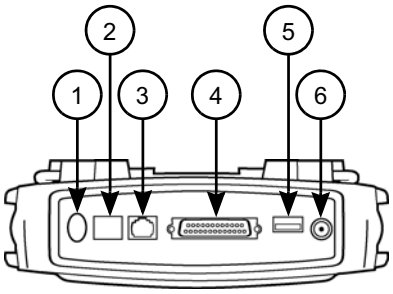


Figure 1.5: Scan Tool Top View

1 **On / Off Button —** turns the scan tool on and off. When using external power, the scan tool stays on until you turn it off. When using internal battery power, the scan tool turns off automatically after a set time (see Unit Defaults in **Adjust Default Settings** on page 12).

2 **Infrared Communication Window —** communicates with peripheral wireless devices, such as a printer.

3 **RS 232 Serial Port —** connects the PC serial cable.

4 **DB25-Pin Port —** connects the vehicle DLC cable.

5 **Universal Serial Bus (USB) Port —** connects peripheral devices such as wireless communication, printers, and portable USB Drives.

6 **External Power Port —** connects the 12 volt power adapter for powering the tool and recharging the internal battery.

Side Views

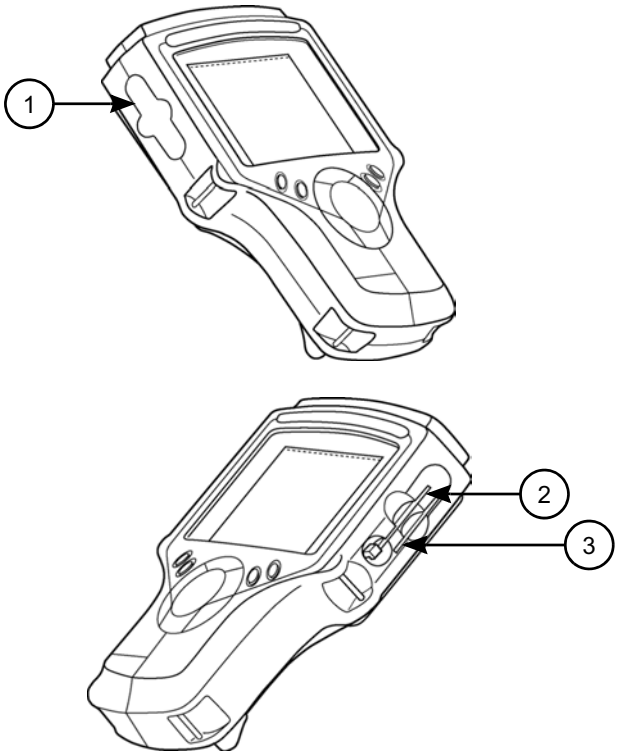


Figure 1.6: Scan Tool Side Views

1 **Memory Card Slot with Cover —** holds the System 2.0 Memory Card (DO NOT REMOVE MEMORY CARD UNLESS PERFORMING SOFTWARE UPDATES TO CARD).

2 **PC Card Slot —** holds an interface card for devices such as a modem, Ethernet network, and wireless communications.

3 **Smart Card Slot —** holds a Smart Card used to authorize (unlock) software applications in the scan tool.

Compact Disc (CD)

Figure 1.7: NGIS Software Suite CD

The NGIS Software Suite contains a PC software application that you use to download software from the Internet to a PC and then to copy the software from the PC to a tool. The CD also contains the following applications:

- NGIS Tool Update software
- NGIS User Guides
- ConnecTech PC software
- NGIS Remote Display PC software

Memory Card

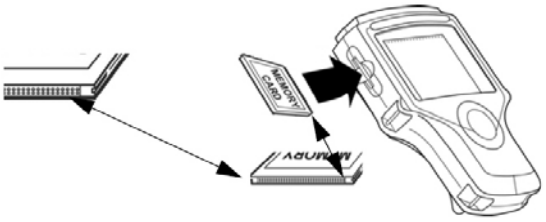


Figure 1.8: Memory Card into Scan Tool Slot

The memory card contains the scan tool's operating software and applications (DO NOT REMOVE THE MEMORY CARD UNLESS PERFORMING SOFTWARE UPDATES TO CARD).

PC Card (optional)

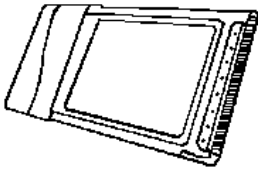


Figure 1.9: Wireless PC Card

The PC card is an interface card for devices such as ConnecTech wireless communications.

Smart Cards

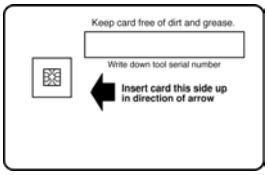


Figure 1.10: Smart Card

Smart Cards are used to authorize (unlock) software applications in the scan tool

IMPORTANT: You receive a Smart Card for each purchased application; keep them in a safe location.

USB Drive (optional)

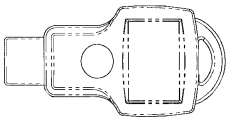


Figure 1.11: Portable USB Drive

A portable USB drive is used for updating the scan tool software. (Free updates are available periodically on the Internet at www.genisysotc.com.)

DLC Cables

The DLC cable connects the scan tool to the vehicle's data link connector (DLC). The cable used depends on the type of vehicle being tested. The two most common cables are shown below. An optional extension cable may also be used.

NOTE: *The scan tool software tells you which cable must be used for the vehicle you are testing. For details, refer to* ***Step 1: Enter the Vehicle Information*** *on page 14.*

System Smart 25-Pin Cable (3305-73)

The System Smart 25-pin cable is for On Board Diagnostic II (OBD II) vehicles.

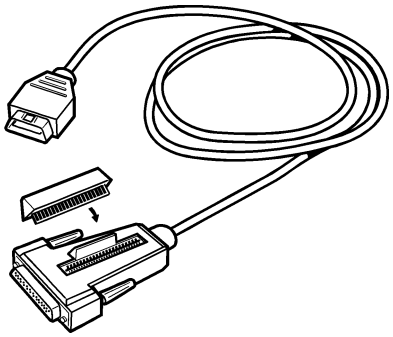


Figure 1.12: System Smart 25-Pin Cable

DB25 Power Cable (3305-72)

The DB25 power cable is for non-OBD II vehicles and some OBD II vehicles.

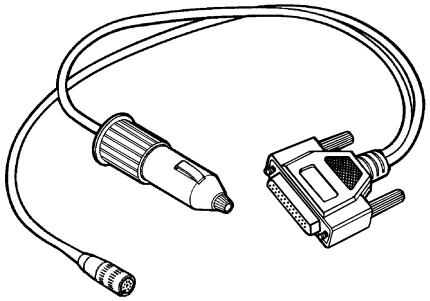


Figure 1.13: DB25 Power Cable

Add-On Hardware Modules (optional)

When you purchase the Cartridge Reader, InfoTech / Scope, or Gas M-P software applications, you receive an add-on hardware module that connects to the back of the scan tool.

NOTE: *For purchasing details, contact your local tool distributor.*

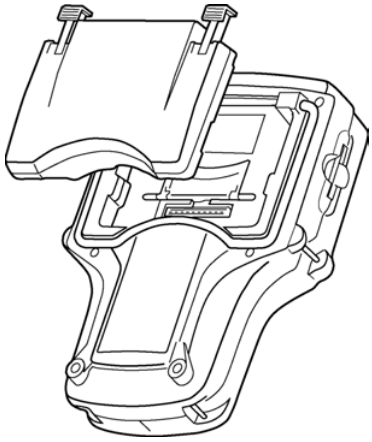


Figure 1.14: Cartridge Reader Module

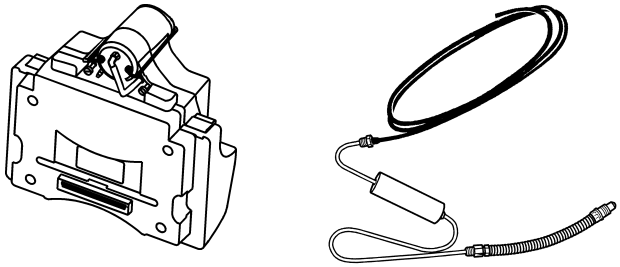


Figure 1.15: Gas M-P Module and Exhaust Test Probe

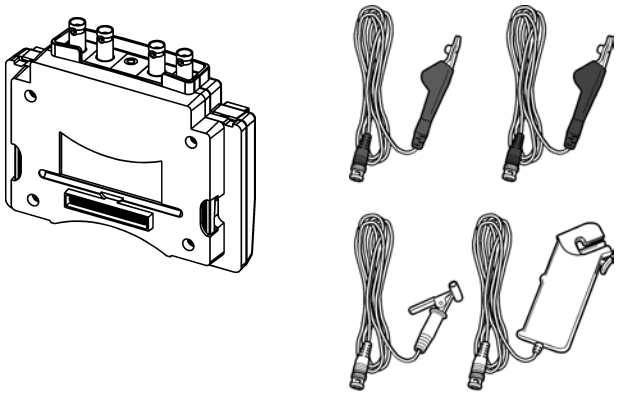


Figure 1.16: Scope Module and Test Probes

Software Descriptions

This section describes the software currently available for the scan tool.

NOTE: *This section does not describe any PC software that is used along with the scan tool.*

System 2.0 Operating System

The System 2.0 Operating System is the newest development for the scan tool. When you turn the scan tool on, System 2.0 provides fast “boot-up” and an icon-based Application Manager screen (see *Figure 1.17*).

In addition, the Application Manager screen has four function keys you can customize for quick access to programs you use frequently, and application updates can be done quickly using a portable USB drive or memory card reader.

System 2.0 also provides quick access to the Global OBD II application if the Menu key is held down while the tool is turned on.

Scan Tool Software Installation / Activation / Updates

The scan tool software is either preinstalled in the scan tool, provided on a compact disc or flash, or can be downloaded from the SPX web site.

Before you can use a scan tool application, it must be installed in the scan tool and activated (unlocked).

> ***NOTE:*** *With icon screens displayed, locked applications have a padlock symbol next to the application icon. With menu screens displayed, locked applications are listed at the bottom of the menu and are grey (screen contrast must be properly adjusted).*

In addition, free software updates for the tool are available periodically on the Internet at www.genisysotc.com.

For complete instructions, refer to *System 2.0 Upgrade* (OTC P/N 534223) or *NGIS Software Application Installation and Updates* (OTC P/N 534168).

Software Applications Overview

When you turn the scan tool on, the Application Manager screen displays options for selecting the software applications in the scan tool as shown below and on the next few pages.

Application Manager Screen

The Application Manager screen contains either icons or a menu of the groups of software installed in the scan tool. All current software applications are included in the scan tool, but only authorized (unlocked) applications are available for use.

NOTE: *You can change the screen to display either icons or a menu as shown below. For details, refer to* ***User Interface Selection*** *on page 73.*

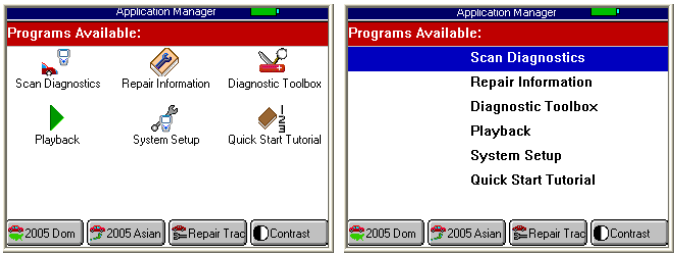


Figure 1.17: Application Manager Screen Examples

With the Application Manager screen displayed, you use the Direction (arrow) keys to select an option and then press the ENTER key to display the next screen. The options on the Application Manager screen are described in the next few sections as follows:

- **Scan Diagnostic Applications** on page 7
- **Repair Information Applications** on page 7
- **Diagnostic Toolbox Applications** on page 8
- **Playback Function** on page 8
- **System Setup Functions** on page 9
- **Quick Start Tutorial** on page 10

NOTE: *You can customize the four function keys at the bottom of the screen for quick access to applications you use frequently. Refer to* ***User Interface Selection*** *on page 73*

Scan Diagnostic Applications

When you select Scan Diagnostics from the Application Manager screen (*Figure 1.17* on page 6), the Scan Diagnostics screen appears, as shown in the examples below.

Figure 1.18: Scan Diagnostics Screen - Graphic User Interface

Figure 1.19: Scan Diagnostics Screen - Classic User Interface

This screen contains options for using the following software applications:

- **Domestic, Asian, ABS/ Air Bag, European, Latin America,** and **Global OBD II** applications are for vehicle diagnostic testing. Refer to ***Scan Diagnostics Applications*** on page 13.
- **GM SPS Reprogramming** applications is for programming of GM vehicle control units. Refer to the separate manual provided with the GS SPS Reprogramming application.
- **Cartridge Reader Module** is for using programs contained on a cartridge and inserted into the top of the Cartridge Reader module. Refer to **Insert Cartridge (optional)** on page 12.

Repair Information Applications

When you select Repair Information from the Application Manager screen (*Figure 1.17* on page 6), the Repair Information screen appears, as shown below.

Figure 1.20: Repair Information Screen - Classic User Interface

This screen contains options for using the following software applications:

- **Repair-Trac** contains repair instructions for hard-to-diagnose “pattern failures” on vehicles with 50,000 or more miles. Simply enter the vehicle information and then view the data. Refer to **Repair Trac** on page 49.
- **Fast Fixes** contains vehicle-specific repair solutions for many “likely” or “overlooked” causes of component problems. Simply enter the vehicle information and then view the data. Refer to **Fast Fixes** on page 50.
- **Code Library** is several databases that contain vehicle-specific lists of diagnostic trouble codes (DTCs) and their names. Simply enter the vehicle information and view the DTC descriptions.
- **InfoTech** is a database of component and vehicle repair and test instructions. For a complete description, refer to the separate manual provided with the InfoTech application.

Diagnostic Toolbox Applications

When you select Diagnostic Toolbox from the Application Manager screen (*Figure 1.17* on page 6), the Diagnostic Toolbox screen appears, as shown below.

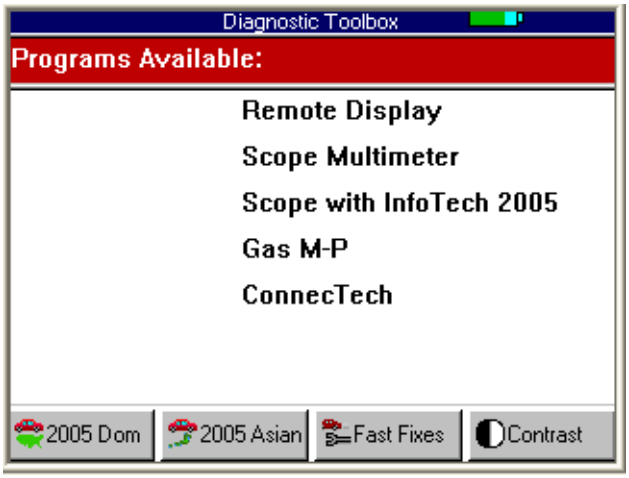


Figure 1.21: Diagnostic Toolbox Screen - Classic User Interface

This screen contains options for using the following software applications:

- **Remote Display**, with the scan tool connected to a PC, displays scan tool screens on the PC.
- **Scope Multimeter** is for using the scan tool along with the Scope add-on module and special probes to do oscilloscope tests, multimeter tests, and special component and vehicle system tests. Refer to the separate Scope Multimeter User Guide.
- **Scope with InfoTech** is for using the scan tool along with the Scope add-on module and special probes to do oscilloscope tests, multimeter tests, and special component and vehicle system tests. (This is the Scope Multimeter software application integrated with the InfoTech application. Scope data displays on the top half of the screen and InfoTech test instructions display on the bottom half of the screen.) Refer to the separate Scope / InfoTech User Guide.
- **Gas M-P** is for using the scan tool along with the Gas add-on module and exhaust sampling equipment to gather and analyze exhaust gas data. Refer to the separate Gas M-P User Guide.
- **ConnecTech**, with the scan tool connected to a personal computer (PC), lets you operate the scan tool through a ConnecTech application installed on the PC. You can also use the ConnecTech application to view datastream file recorded to a USB drive. Refer to the separate ConnecTech Quick Start Guide.

Playback Function

When you select Playback from the Application Manager screen (*Figure 1.17* on page 6), the Events to Playback screen appears, as shown below.

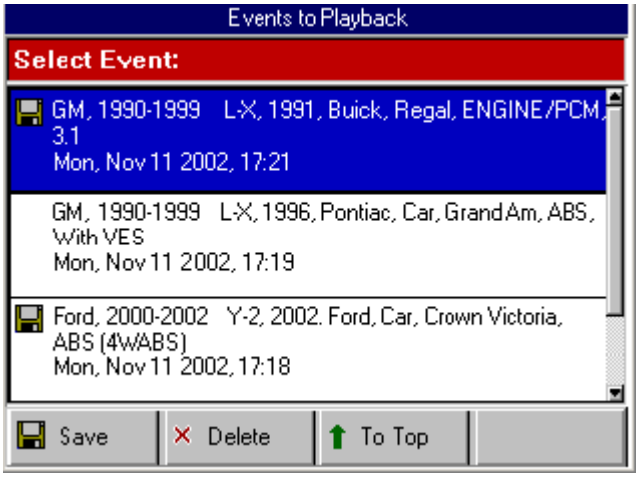


Figure 1.22: Events to Playback Screen

The Playback function lets you view data recorded with the Datastream Record function (see page 22) and the DTC-Triggered Recording function (see page 32). It also lets you save and delete recorded files.

For details, refer to ***Playback*** on page 67.

System Setup Functions

When you select System Setup from the Application Manager screen (*Figure 1.17* on page 6), the System Setup screen appears, as shown below.

Figure 1.23: System Setup Screen - Graphic User Interface

Figure 1.24: System Setup Screen - Classic User Interface

This screen contains options for viewing information about the scan tool and adjusting default settings for the scan tool as follows:

- **USB Drive Tool Update** — update the scan tool software with files on a USB drive.
- **Contrast Adjust** — adjust the contrast of the LCD screen.
- **Printer Selection** — select a printer for printing from the scan tool.
- **Print Header** — set up a heading for reports that you print from the scan tool.
- **Unit Defaults** — set the date, time, units-of-measure, and automatic shut down time. It also lets you turn the audible beep and print header functions on or off.
- **Revision Levels** — view software version numbers.
- **Dial-Up Settings** — set up IP addresses for communication (wired or wireless) between the scan tool and a PC or external device.
- **Technical Support** — view technical support information.
- **User Interface Selection** — set the scan tool main screens to display options as either icons or menus.
- **Color Scheme Selection** — set the color of the background and text that appears on the screens.
- **Function Key Assignment** — assign specific applications to the function keys at the bottom of the Application Manager screen.
- **Hardware Tests** — test the LCD screen, keypad keys, and beeper; view the time clock for the scan tool and the scan tool's serial number.
- **Language** — set the default language for the scan tool software.
- **Disk Usage** — view details about the scan tool memory size and usage.
- **File System Check** — test the file system on the memory card(s).

For more information, Refer to Setup and System setup chapters;

Quick Start Tutorial

When you select Quick Start Tutorial from the Application Manager screen (*Figure 1.17* on page 6), the first tutorial screen appears, as shown below.

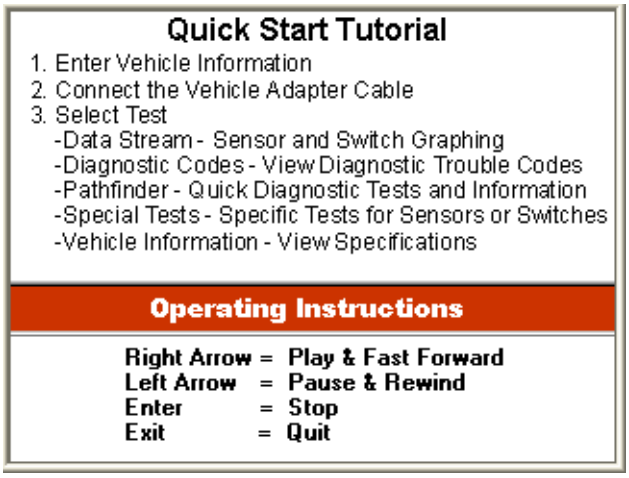


Figure 1.25: Quick Start Tutorial Screen

The tutorial screens provide an overview of how to use the scan tool keys and screens.

User Guide Instructions

Various *User Guides* are provided as portable document format (pdf) files that install on the PC during the NGIS Software Suite CD installation (refer to *NGIS Software Application Installation and Updates*, OTC p/n 534168).

To open a *User Guide*, double-click the User Guide icon on the Windows desktop, select a language and then select a User Guide.

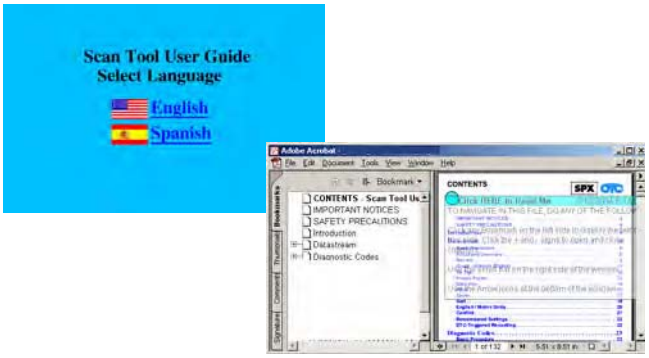


Figure 1.26: User Guide Language Selection and User Guide Windows

The left side of the *User Guide* window contains a Table of Contents; click a topic to display its contents. The right side of the window displays the contents; right-click inside the contents to display a navigation menu. You can also print the *User Guide*. For help using the file, start the Acrobat Reader program and then select Help from the main menu.

NOTE: *To view the User Guides, the Adobe Acrobat Reader software application must be installed on the PC. When you open the User Guide, if an Open With box appears, click the Cancel button and do one of the following to install Acrobat Reader:*

- *To install an English version, insert the NGIS Software Suite CD into the PC's CD drive. When the installation Welcome window appears, click Cancel, then Yes, then Finish. Then click the Windows Start button and click Run to display the Run box. Click the Browse button and then select My Computer, (drive where CD is), and AcroReader51_ENU.exe. Click the Open button (or OK). Then click the OK button in the Run box and follow the on-screen instructions.*
- *To install a version for another language, go to the website: http://www.adobe.com/products/acrobat/reader_archive.html#Win*

Disclaimer: Acrobat Reader is licensed and copyrighted by Adobe Systems Incorporated. It is provided as a courtesy, not a license for use. If you install it, you must accept and abide by the terms of it's license agreement, which display the first time you start the application.

2: Setup

Provide Power to Scan Tool

Before using the scan tool, you must provide power to the scan tool. There are three methods for providing power to the scan tool:

- AC/DC external power adapter
- Cable connection to vehicle
- Internal battery pack

During vehicle testing, power for the scan tool is usually provided through the vehicle cable connection. (Therefore, it is not necessary to have the internal battery pack fully charged before testing.)

When the scan tool is not connected to a vehicle, the scan tool can be powered with an AC/DC external power adapter (OTC P/N 3421-04) or the internal rechargeable battery pack (OTC P/N 239180).

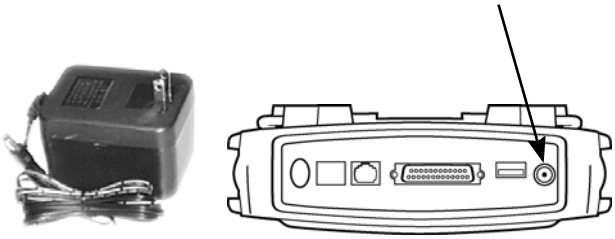


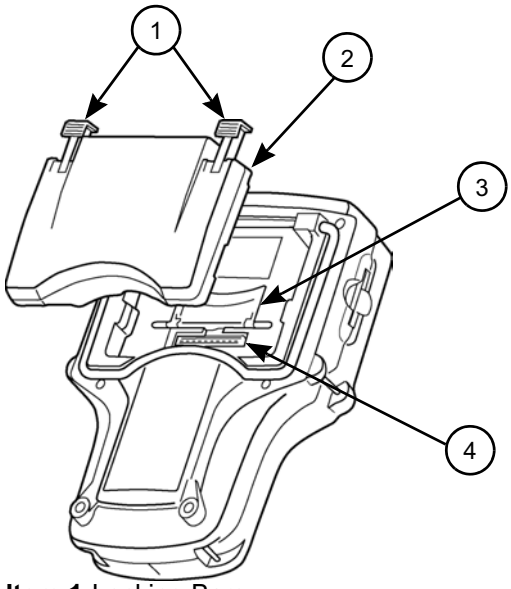
Figure 2.1: Power Adapter and Scan Tool Power Port

Connect the Hardware Module (optional)

If using the Cartridge Reader, InfoTech/Scope, or Gas M-P software applications, you must first connect the hardware module to the scan tool. Use the following steps to connect a hardware module.

IMPORTANT: Turn off scan tool before connecting or removing hardware module. Failure to do so may cause internal damage not covered by warranty.

1. Press the tool **On/Off** button to turn the power off.
2. Position the scan tool to access the back side, then open the protective HIP door.
3. Slide the locking bars out on the hardware module (you may need to hold them out).
4. Position the hardware module with the hardware interface ports aligned.
5. Place the module into the compartment and press it into place.



Item 1 Locking Bars
Item 2 Cartridge Reader Module
Item 3 Hardware Interface Port Door (shown open)
Item 4 Hardware Interface Port

Figure 2.2: Cartridge Reader Module

6. Slide the locking bars in to lock the module in place.

NOTE: *To remove the module, slide the locking bars out and pull the module upward. Close the HIP door.*

Insert Cartridge (optional)

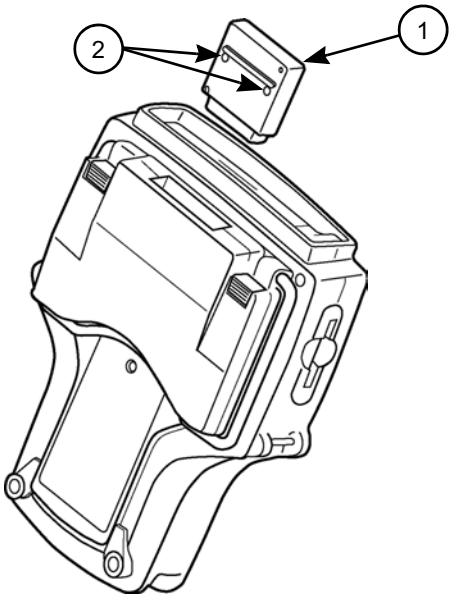
If using the Cartridge Reader hardware module, you must insert the software cartridge into the module. Use the following steps to insert the cartridge.

1 Position the cartridge with the locking bumps positioned as illustrated in *Figure 2.3*.

2 Align the cartridge with the slot and press firmly together until the locking bumps snap into place.

IMPORTANT: Insert the cartridge as shown below. Be sure the locking bumps are pointing away from the front of the scan tool.

NOTE: *To remove a cartridge from the Cartridge Reader Module, grip the cartridge firmly and pull it straight out.*



Item 1 Cartridge
Item 2 Locking Bumps

Figure 2.3: Software Cartridge

Adjust Default Settings

Use the System Setup functions let you view information about the scan tool and adjust default settings for the scan tool as follows:

NOTE: *Temperature or lighting may affect the brightness of the scan tool screen. If necessary, use the Contrast Adjust function to adjust the screen for working conditions.*

1 Provide power to the scan tool, press the **On / Off** button to turn the scan tool on, and wait for the Application Manager screen to appear.

2 Use the **Down Direction** key to select **System Setup** and then press the **ENTER** key. This displays the System Setup screen, shown below.

Figure 2.4: System Setup Screen - Classic User Interface

3 Use the **Direction** keys to select an item to adjust (described below) and then press the **ENTER** key.

4 Follow any on-screen instructions; use the **Direction** keys as needed to adjust settings; use the **EXIT** key to exit the screens.

5 For detailed instructions, refer to ***System Setup*** on page 69.

3: Scan Diagnostics Applications

Overview

When you select Scan Diagnostics from the Application Manager screen (*Figure 3.3* on page 14), the Scan Diagnostics screen appears, as shown in the examples below.

Figure 3.1: Scan Diagnostics Screen - Graphic User Interface

Figure 3.2: Scan Diagnostics Screen - Classic User Interface

This screen contains options for using the Scan Diagnostics software applications.

- This chapter provides test startup steps for the Domestic, Latin America, Asian, European, ABS/Air Bag, and Global OBD II applications. (These applications all operate the same, but each application covers different groups of vehicles, such as US, Asian, ABS, etc.)
- To use the GM SPS Reprogramming application, refer to the separate manual provided with the GM SPS Reprogramming application.
- To connect a Cartridge Reader, refer to **Insert Cartridge (optional)** on page 12.

To use the scan diagnostic tests, you select a test from the Scan Diagnostics screen, enter vehicle information into the scan tool, connect a communication cable between the scan tool and the vehicle's data link connector (DLC), and then select a diagnostic function. The diagnostic functions may include any of the following (these vary by vehicle):

- **Datastream** - view live streaming data for a selected vehicle ECU.
- **Custom Datastream** - select specific sensors or switches for viewing live data.
- **Integrated Scan / Gas** - with the Gas hardware module connected and the Gas M-P application unlocked, view exhaust gas readings (CO, CO2, HC, O2, NOX, AFR) along with live ECU data readings.
- **Diagnostic Trouble Code**s - view and clear DTC for a selected ECU.
- **Pathfinder** - view vehicle-specific information, such as DTC descriptions, TSBs, component locations, etc.
- **Vehicle Information** - view vehicle-specific information, such as TSBs, specifications, component locations, etc
- **PROM ID** - view the ID number for the selected ECUs programmable read-only memory (PROM)
- **Diagnostic States (GM)** - place a vehicle in special test modes (states).
- **Post Collision Tests (Air Bag)** - view instructions for testing air bags after repair(s).
- **Special Tests** - perform special diagnostic tests by manually controlling system components.

⚠ WARNING: Before performing any diagnostic functions, refer to the Safety Precautions and instructions provided in the User Guide and the warnings provided by the vehicle manufacturer. In addition, follow any warnings and descriptions provided on the scan tool screens.

Test Startup and Vehicle Connection

This chapter includes the following steps:

Step 1: Enter the Vehicle Information (below)

Step 2: Connect the Cable on page 16

Step 3: View the Quick Test Results on page 19

Step 4: Select the Diagnostic Function on page 20

Step 1: Enter the Vehicle Information

Use the following steps to enter vehicle information and to determine which cable to use for the communication connection between the scan tool and the vehicle's DLC.

1 Press the **On / Off** button to turn the scan tool on; wait for the Application Manager screen to appear.

NOTE: *The System 2.0 scan tool operating system also provides quick access to the Global OBD II application if you hold down the Menu key when you turn the scan tool on.*

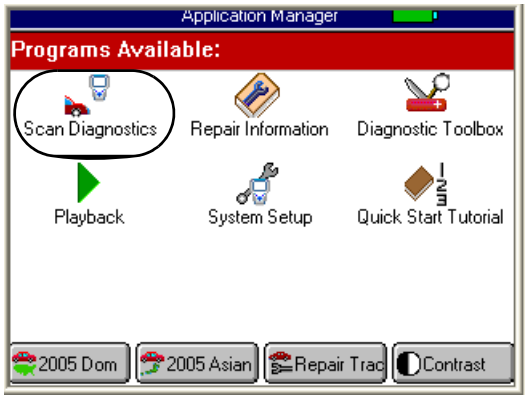


Figure 3.3: Application Manager Screen - Graphic User Interface

2 Select **Scan Diagnostics** and press the **ENTER** key. This displays the Scan Diagnostics screen.

NOTE: *If you have the application assigned to one of the function keys at the bottom of the screen, you can alternatively press the function key to start the application.*

Figure 3.4: Scan Diagnostics Screen - Graphic User Interface

3 Select **a diagnostic test** and press the **ENTER** key.

- If you select **Domestic, Asian, ABS / Air Bag, Latin America,** or **European**, a series of Vehicle Identification screens appears for you to identify the vehicle; go to step 4.
- If you select **Global OBD II**, the Required Cables illustration appears; go to step 7.

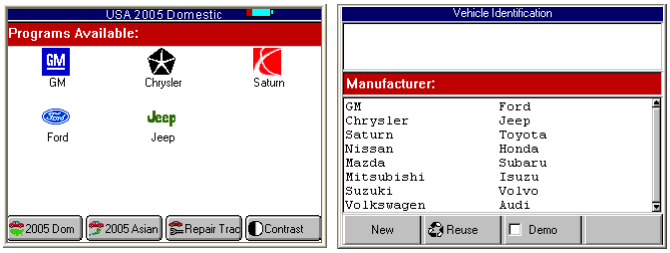


Figure 3.5: Vehicle Information - Manufacturer Screen (both Graphic and Classic User Interfaces shown)

4 With the Vehicle Information screen displayed, you can enter new information for a vehicle or you can select and reuse saved information for a vehicle already tested. Do one of the following:

- To enter new information for a vehicle, go to step 5 and then step 7.
- To reuse saved information for a vehicle already tested go to step 6 and then step 7.

5 To enter new information for a vehicle, do the following:

a **Select the vehicle manufacturer** and press the **ENTER** key. This displays the selected vehicle description in the top part of the screen and changes the middle part of the screen to the next screen of a series of screens, as shown below.

NOTE: *The screens shown below are only examples. The screens that actually appear are different for each vehicle.*

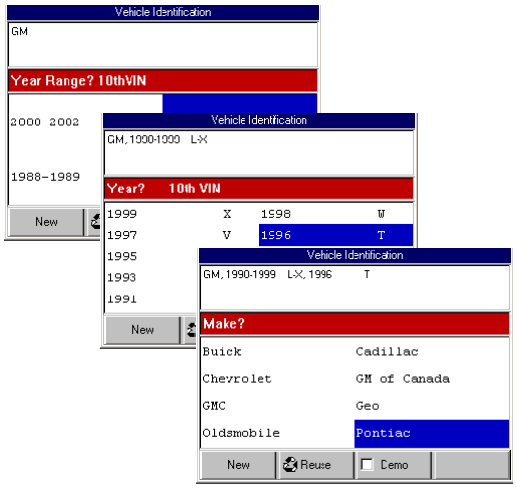


Figure 3.6: Vehicle Information - Series of Screens (Classic User Interface)

b **On each screen that appears, select the correct option** and then press the **ENTER** key. Do this until the complete vehicle information is entered and the illustration of the required cables appears, as shown in Step 7.

NOTE: *On the Vehicle Information screens, you can press the Demo function key to display demonstration data in the software. The Demo function stays on until you press the function key again to turn it off. When the Demo function is on, a checkmark appears in the box on the function key.*

6 To reuse saved information for a vehicle already tested, do the following:

a Press the **Reuse** function key. This displays the Reuse Vehicles screen, which contains a list of saved vehicle descriptions.

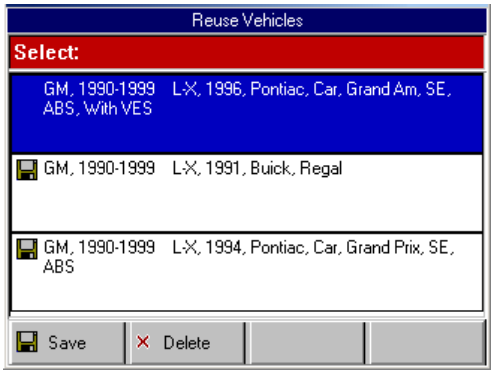


Figure 3.7: Reuse Vehicles Screen

b **Select the vehicle description to use** and press the **ENTER** key. This displays the illustration of the required cables, as shown in Step 7.

NOTE: *The Reuse Vehicles list holds 25 vehicle descriptions. When the list is full, old descriptions automatically delete as you enter new descriptions. To prevent a description from being automatically deleted, highlight the description and press the* ***Save*** *function key. This places a disk icon to the left of the file name and saves the description until you delete it. (Use the* ***Delete*** *function key to delete a selected description.)*

7 After you have entered new vehicle information or selected a vehicle description to reuse, the Required Cables illustration displays on the Vehicle Identification screen. With this screen displayed, make the required cable connections as shown on the screen. For specific steps, refer to the next section (**Step 2: Connect the Cable** on page 16).

NOTE: *Some vehicles do not have a DLC and do not require a cable connection. For these vehicles, the screen states that no cable connection is required. If this happens, go to* ***Step 4: Select the Diagnostic Function*** *on page 20*.

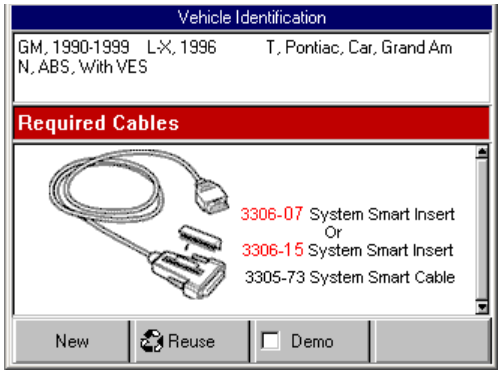


Figure 3.8: Vehicle Information - Required Cables Screen

NOTE: *For some vehicles, this screen will illustrate the vehicle's Data Link Connector (DLC) test terminals rather than the required cables.*

Step 2: Connect the Cable

The method used to connect the scan tool to a vehicle's DLC depends on the vehicle's configuration as follows:

- A vehicle equipped with an On Board Diagnostics Two (OBD II) vehicle management system supplies both communication and 12-volt power through a standardized J-1962 data link connection (DLC).
- A vehicle not equipped with an OBD II system supplies communication through a DLC connection and supplies 12-volt power through the cigarette lighter receptacle or a connection to the battery.

NOTE: *Both connections described above charge the scan tool's battery while connected.*

OBD II Vehicle Cable Connection

This type of connection generally requires the System Smart 25-pin cable (3305-73) and a System Smart Insert (SSI).

To connect the System Smart 25-pin cable, follow these steps:

1 Locate the required SSI and insert it into the port on the top of the cable's 25-pin connector.

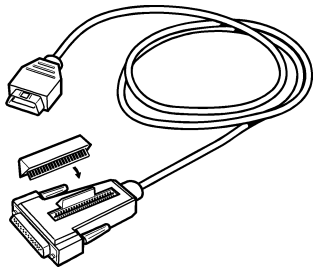


Figure 3.9: SSI and System Smart 25-pin Cable

2 Connect the cable's 25-pin connector to the DB25 port on the top of the scan tool. Finger tighten the connecting screws.

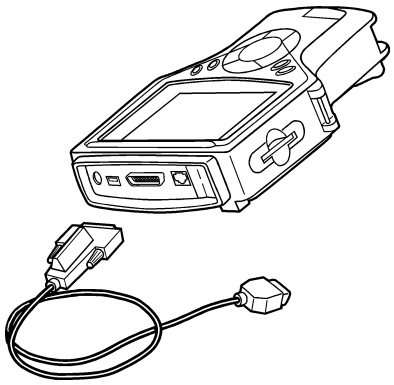


Figure 3.10: System Smart 25-pin Cable Connection to Scan Tool

NOTE: *Extension cable (3305-71) can be used between the scan tool and the System Smart 25-pin cable.*

3 Connect the cables's J-1962 connector into the vehicle's DLC, located under the vehicle dash.

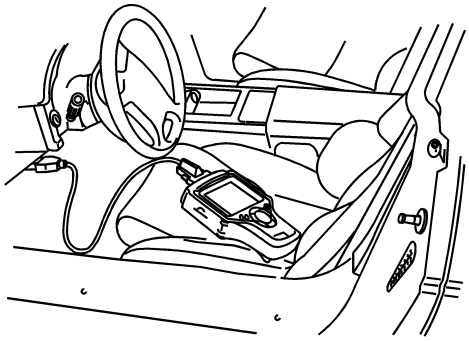


Figure 3.11: System Smart 25-pin Cable Connection to Vehicle DLC

4 With the Required Cables illustration still displayed on the scan tool, press the **ENTER** key. This initiates communication with the vehicle's computer and displays the next screen.

5 Do one of the following:

- If either a System Readiness Test message screen or a Quick Test results screen appears, continue with **Step 3: View the Quick Test Results** on page 19. (See *Figure 3.16* on page 19.)
- If either a Message screen or a Diagnostic Menu screen appears, continue with **Step 4: Select the Diagnostic Function** on page 20. (See *Figure 3.17* on page 20.)

NOTE: *Generally, the System Readiness Test or Quick Test results screen appears for Global OBD II test and the Message or Diagnostic Menu screen appears for the other scan diagnostic tests. However; this is not always true and can vary by vehicle.*

Non-OBD II Vehicle Cable Connection

This type of connection generally requires the DB25 Power cable (3305-72) or another vehicle-specific cable.

NOTE: *Some non-ODB II vehicles may require the System Smart 25-pin cable.*

To connect the DB25 Power cable or another similar cable, follow these steps:

1 Locate the required adapter and connect the adapter's 8-pin connector to the cable's 8-pin connector.

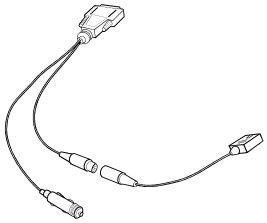


Figure 3.12: Adapter Connection to DB25 Power Cable

2 Connect the cable's 25-pin connector to the DB25 port on the top of the scan tool. Finger tighten the connecting screws (see *Figure 3.13*).

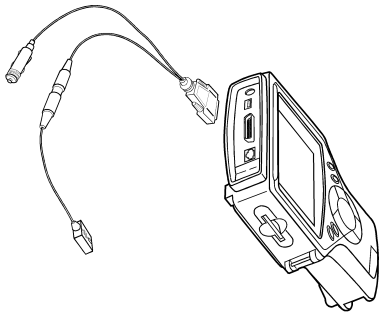


Figure 3.13: DB25 Power Cable Connection to Scan Tool

NOTE: *Extension cable (3305-71) can be used between the scan tool and the DB25 Power cable.*

3 Connect the cables's power plug into the vehicle's cigarette lighter receptacle.

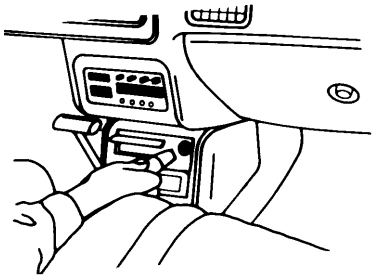


Figure 3.14: DB25 Power Cable Connection to Cigarette Lighter Receptacle

NOTE: *Battery Adapter (212638) can be used to connect the cable's power plug to the vehicle's battery.*

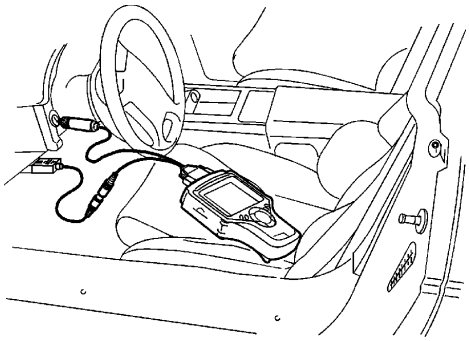


Figure 3.15: DB25 Power Cable Connection to Vehicle's DLC

4 Connect the adapter's connector to the vehicle's DLC.

NOTE: *The vehicle's DLC is not always located under the dash as shown above.*

NOTE: *Some adapters may have more than one connector or may have test leads instead of a connector. Whatever the case, make the required connections to the vehicle's DLC.*

5 With the Required Cables illustration still displayed on the scan tool, press the **ENTER** key. This initiates communication with the vehicle's computer and displays the next screen.

6 Do one of the following:

- If either a System Readiness Test message screen or a Quick Test results screen appears, continue with **Step 3: View the Quick Test Results** on page 19. (See *Figure 3.16* on page 19.)
- If either a Message screen or a Diagnostic Menu screen appears, continue with **Step 4: Select the Diagnostic Function** on page 20. (See *Figure 3.17* on page 20.)

NOTE: *Generally, the System Readiness Test or Quick Test results screen appears for Global OBD II test and the Message or Diagnostic Menu screen appears for the other scan diagnostic tests. However; this is not always true and can vary by vehicle.*

Step 3: View the Quick Test Results

After you connect the cable and press the ENTER key on the scan tool, use the following steps if either the System Readiness Test message screen or the Quick Test results screen appears.

NOTE: *The Quick Tests provide a quick link to the vehicle's PCM for viewing OBD II emissions readiness tests and DTCs.*

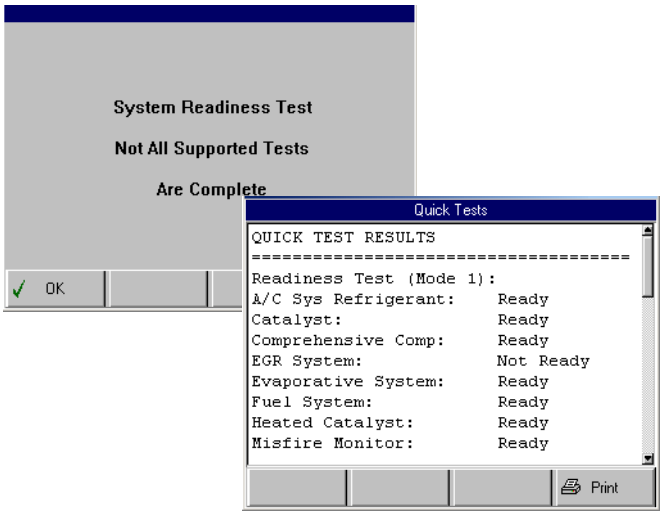


Figure 3.16: System Readiness Test Message Screen and Quick Test Results Screen

1. If the "System Readiness Test, Not all supported tests are complete" message appears, press the **OK** function key to continue. The screen displays the message "Performing Quick Tests" and then displays the Quick Tests results screen, shown above.

   NOTE: *If the system tests are not complete, press the EXIT key twice to return to the Required Cable illustration screen. Then, start the vehicle, drive it around for a few minutes, leave the engine running, and press the scan tool's ENTER key to run the tests again.*

2. Use the **Up** and **Down Direction** keys to scroll through the test results.
3. Optionally, print the test results. Refer to **Printing** on page 75.
4. After viewing the Quick Test results, press the **ENTER** key.
5. Continue with **Step 4: Select the Diagnostic Function** on page 20.

Step 4: Select the Diagnostic Function

After you connect the cable and press the ENTER key on the scan tool, use the following steps if either an instructional message screen or the Diagnostic Menu screen appears (shown below). In addition, for OBD II vehicles, use the following steps after you have viewed the Quick Test results screen (*Figure 3.16* on page 19) and pressed the ENTER key.

1 With the Required Cables (or Connectors) illustration still displayed, press the **ENTER** key.

2 One or more instruction screens may appear. If so, read each screen, follow the instructions, and press the **OK** function key to display the next screen. Do this until the Diagnostic Menu screen appears.

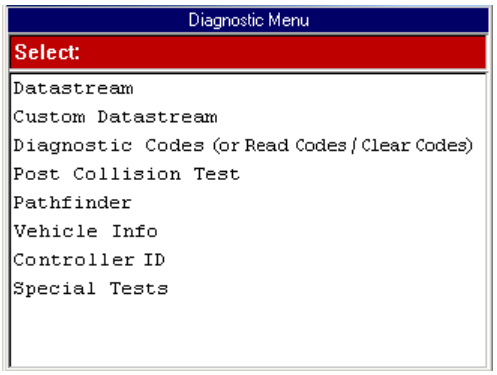


Figure 3.17: Diagnostic Menu Screen

NOTE: *The screen shown above is only an example. It shows all possible options for the Diagnostic menu. During real testing, only the options available for the vehicle being tested will appear on this screen.*

3 **Select the option** for the diagnostic function to perform and press the **ENTER** key:

- Select **Datastream** to view sensor and switch datastream information. For details, refer to ***Datastream*** on page 21.
- Select **Custom Datastream** to view live data readings for specific sensors and switches and to increase the refresh rate by viewing fewer items than normal Datastream. For details, refer to ***Custom Datastream*** on page 33.
- Select **Integrated Scan / Gas** to view exhaust gas readings (CO, CO2, HC, O2, NOX, AFR) along with the sensor and switch datastream readings. For details, refer to ***Integrated Diagnostics - Scan / Gas*** on page 35.
- Select **Diagnostic Trouble Codes** to view and clear diagnostic trouble codes set by the vehicle ECU(s). For details, refer to **Diagnostic Trouble Codes** on page 37.
- Select **Pathfinder** to view vehicle-specific information, such as DTC descriptions, TSBs, component locations, etc. For details, refer to ***Pathfinder*** on page 49.
- Select **Vehicle Information** to view vehicle-specific information, such as TSBs, specifications, component locations, etc. For details, refer to ***Vehicle Info*** on page 55.
- Select **PROM ID** to view the ID number for the selected ECUs programmable read-only memory (PROM). For details, refer to.
- Select **Diagnostic States (GM)** to place a vehicle in special test modes (states). For details, refer to ***Diagnostic States (GM)*** on page 59.
- Select **Post Collision Tests (Air Bag)** to view instructions for testing air bags after repair(s). For details, refer to ***Post Collision Test (Airbag)*** on page 61.
- Select **Special Tests** to perform special diagnostic tests by manually controlling system components. For details, refer to ***Special Tests*** on page 63.

WARNING: Before performing any diagnostic functions, refer to the Safety Precautions and instructions provided in this User Guide and the warnings provided by the vehicle manufacturer. In addition, follow any warnings and descriptions provided on the scan tool screens.

4: Datastream

The Datastream function lets you view live data from a vehicle's electronic control unit (ECU). This chapter describes how to use the Datastream function.

Basic Datastream Procedure

Use the following steps to obtain a basic understanding of how the Datastream function works.

To use the datastream function, follow these steps:

1 Follow the instructions in **Test Startup and Vehicle Connection** on page 14 to display the Diagnostic Menu screen.

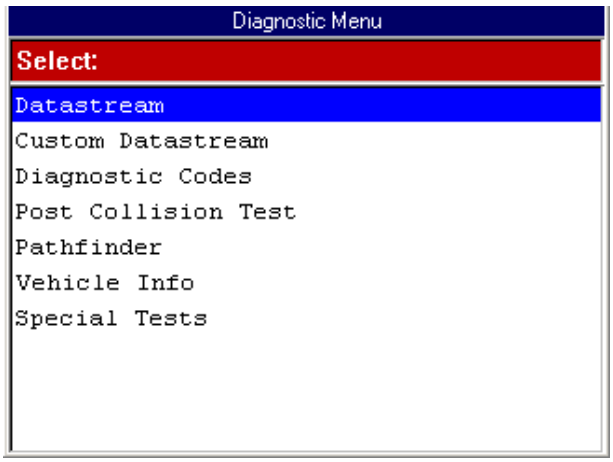


Figure 4.1: Diagnostic Menu Screen

2 Select **Datastream** and press the **ENTER** key. This displays the Datastream screen

NOTE: *Optionally, you can use Custom Datastream and select specific datastream items for viewing. For details, refer to* ***Custom Datastream*** *on page 33.*

NOTE: *If a group selection screen appears, select a group and press the* ***ENTER*** *key to display the Datastream screen.*

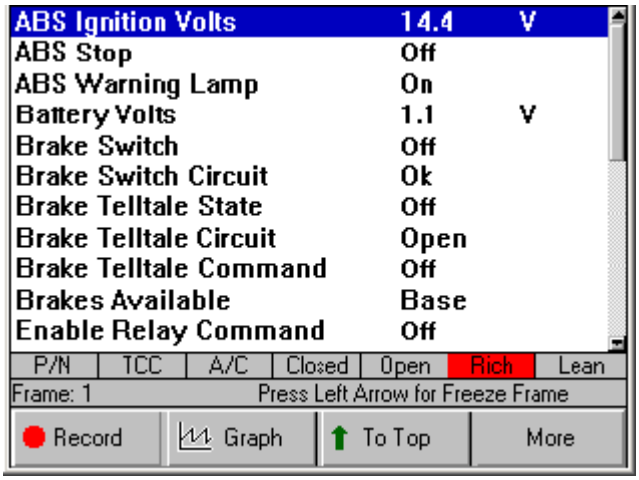


Figure 4.2: Datastream Screen

3 Notice the following about the Datastream screen:

- Each line displays a data item. The first time you test a vehicle, the top line displays in Graph format and the remaining lines display in Digital format. (See **Remembered Settings** on page 32.)
- You use the Up and Down Direction keys to scroll through the data and to select lines (one line at a time). You use the Left and Right Direction keys to scroll through screens (one screen at a time).
- The screen's data updates as the software reads from the vehicle's ECU. Each update is called a "frame" of data.
- The function keys at the bottom of the screen let you perform several other functions on the screen. For details, refer to the next section, **Functions Overview** on page 22.
- The status line above the function keys displays current software status information.
- You can stop and start the live readings at any time. When you stop the readings, the data "freezes" on the screen. For details, refer to **Freeze Frame** on page 27.
- The LED bar, directly above the status line, appears only when you use the More function key, LED Bar option. For details, refer to **Show / Hide LED Bar** on page 30.

4 When you are finished using the screen, press the **EXIT** key to return to the Diagnostic Menu screen.

Datastream Functions

Functions Overview

There are several functions you can use on the Datastream screen. Most of the functions are activated with the function keys at the bottom of the screen. These functions, described in detail on the next few pages, include the following:

- **Record** – records the data for viewing again at a later time. (See next column.)
- **Graph / Analog / LED / Digital** – depending on the type of data on a line, changes the view of a selected line from digital to graphical, analog, or LED. (See page 24.)
- **To Top** – moves a selected data item to the top of the screen. (See page 26.)
- **Lock** – locks selected data lines so they are always included when recording and printing, even if they are below the viewable area of the screen. (See page 26.)
- **Freeze Frame** – "freezes" the data acquisition and displays past data. (See page 27.)

NOTE: *The following functions are on the menu that appears when you press the More function key.*

- **Pathfinder** – provides quick access to the Pathfinder functions from within the Scan Diagnostic applications. (See page 27.)
- **Print** – prints the data in the viewable area of the current data display. (See page 28.)
- **Zoom** – enlarges the view of a data line. (See page 28.)
- **Sort** – rearranges the data alphabetically or with the LED and graphed lines at the top. (See page 29.)
- **English / Metric Units** – changes the units of measure for the data from English to Metric, or vice versa. (See page 30.)
- **Show / Hide LED Bar** – displays a row of LED readings directly above the status line and function keys. The LED readings are for frequently monitored switches. (See page 30.)
- **Show / Hide Analog** – when analog gauges are displayed at the top of the screen, temporarily hides the gauges or displays them again. (See page 31.)
- **Conflict —** for Global OBD II testing, shows details when two or more PCMs are reading conflicting data for a sensor or switch. (See page 32.)

NOTE: *There are a couple of automatic Datastream functions:* ***Remembered Settings*** *and* ***DTC-Triggered Record****. They are described on page 32.*

Record

Record to Scan Tool Memory

The Record function lets you save up to 25 data files of up to 150 frames of data (75 frames that occur before pressing the Record function key and 75 frames that occur after pressing the key). You can then use the Playback function to view the saved files.

NOTE: *The length of time for each frame varies per vehicle. Generally, one frame of data is about 1/4 of a second, or 4 frames per second.*

To record to scan tool memory, follow these steps:

1 Follow the steps in **Basic Datastream Procedure** on page 21 to display the Datastream screen.

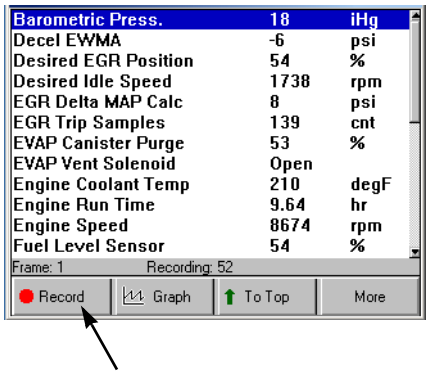


Figure 4.3: Record Function

2 The recording will include all data lines that are within view on the screen and locked and graphed lines that are not in view on the screen. Optionally, do any of the following to select data lines to include in the recording:

- To lock a line, **select the line** and then press the **ENTER** key. This places a padlock icon at the left side of the line. Repeat this for as many lines as you want to lock and include in the recording.

  NOTE: *To unlock a line, select the line again and press the ENTER key again. This removes the padlock icon from the left side of the line.*

- To change a line to the Graph view, **select the line** and press the **Graph** function key. For details, refer to ***Playback*** on page 67.
- To move a line to the top, **select the line** and press the **To Top** function key. For details, refer to **To Top** on page 26.

3 Press the **Record** function key (*Figure 4.3* on page 22). This does the following:

- Temporarily shades the Record function key.
- Automatically records the past 75 frames of data that occurred before pressing the key (or however many have occurred if less than 75), continues recording the next 75 frames of data as they occur, and then stops recording.

  NOTE: *To record less than 150 frames of data, press the EXIT key at any time. This stops the recording and saves only the frames already captured.*
- Displays a countdown on the status line of the number of frames left to be recorded (from Recording: 75 to Recording:1). When the countdown reaches 1, the recorded data is saved as an Event file and placed in a Playback folder.

  NOTE: *The playback folder holds up to 25 Event files. When you record more than five files, new recordings overwrite the old ones. For details, refer to* ***Playback*** *on page 67.*

4 When the recording stops, continue viewing live data or use the **EXIT** key to return to previous screens.

5 To view the saved data file, refer to ***Playback*** on page 67.

Record to a Portable USB Drive

The scan tool has a special feature that lets you record files of up to 10,000 frames of data (that occur after pressing the key) to a portable USB drive. You can then view (playback) the data on a personal computer (PC) that has the ConnecTech software installed.

NOTE: *The length of time for each frame varies per vehicle. Generally, one frame of data is about 1/4 of a second, or 4 frames per second.*

You can record any number of files as long as they fit on the free space on the USB drive.

NOTE: *To check USB drive free space, insert the drive into a USB port on the PC and double-click the My Computer icon on the Windows desktop. Right click the name of the USB drive in the PC and click Properties on the menu that appears. Alternatively, if you double-click the name of the USB drive, you can view the drive contents and delete files from the drive. For more information, refer to the Windows User Guides and Help Systems.*

To record to scan tool memory, follow these steps:

1 Turn the scan tool off.

2 Insert the USB drive extension cable into the USB port on the top of the scan tool.

3 Insert the USB drive into the loose end of the extension cable.

NOTE: *With a DLC cable connected to the scan tool, the portable USB drive will connect to the scan tool USB port only by using the extension cable.*

4 Follow the steps in **Record to Scan Tool Memory** on page 22.

5 To view the saved data files, use the ConnecTech program on the PC. For details, refer to the ConnecTech Quick Start Guide, pdf User Guide, and online Help System.

Graph / Analog / LED / Digital

The Graph/ Analog / LED / Digital function lets you change the display type for each line on the Datastream screen. Depending on the type of data on a line, you can change a selected line from digital to a graphical or LED display. You can also set some of the lines to display analog meters (gauges) at the top of the screen.

To change the display for each line, follow these steps:

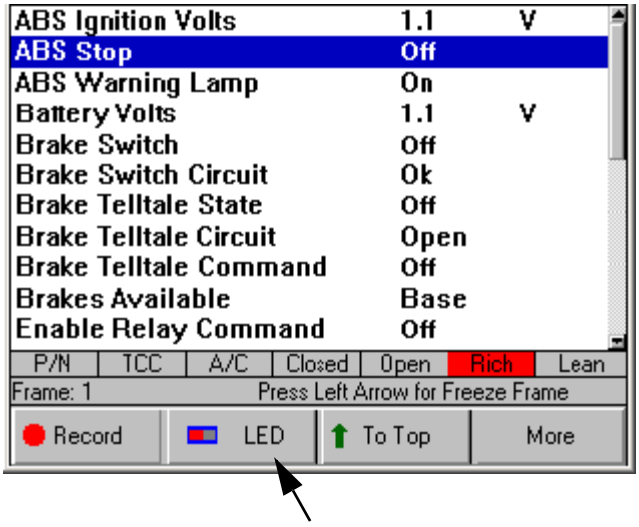


Figure 4.4: Datastream Screen - Digital Display

1 With the Datastream screen displayed, use the **Up** or **Down Direction** key to select the line to change.

2 Press the **Graph / Analog / LED / Digital** function key.

NOTE: *This name of this function key changes each time you press the key. The name of the key represents the next display type that will appear when you press the key.*

3 Repeat steps 1 and 2 for each line to change.

About Digital Display

When a line is displayed as Digital, its reading is a word or a number as shown for all the lines in *Figure 4.4*.

You can change the display of the lines as follows:

- If the selected line's data reading is a word (usually a switch reading), such as On, Off, Open, Closed, etc., then you can change the line's display back and forth between LED and Digital.
- If the selected line's data reading is a number (usually a sensor reading), such as 1.1 V, 23.3 Amps, etc., then you can change the line to also display as either a graph or an analog gauge.

About LED Display

If a selected line's data reading is a word (usually a switch reading such as On, Off, Open), you can use the LED function key to change the line to display as an LED bar. For example, see *Figure 4.4* and *Figure 4.5*. Notice how the function key changes to toggle back and forth between LED and Digital.

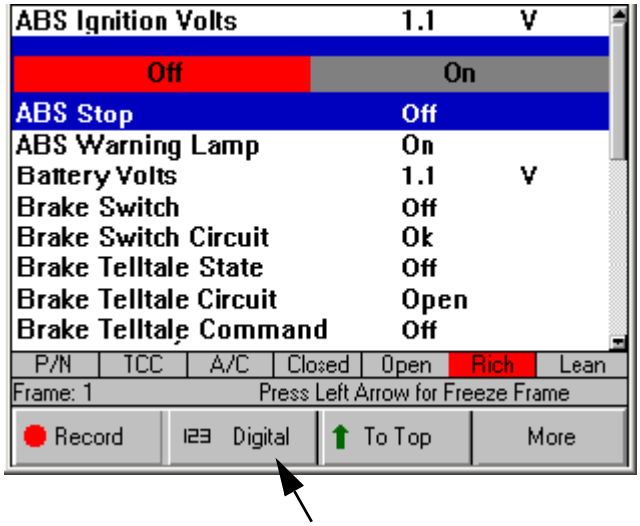


Figure 4.5: Datastream Screen - LED Display Function

About Graph Display

If a selected line's data reading is a number (usually a sensor reading such as 14.4 V, 1.1 V, or 23 Amps), you can use the Graph function key to display the line's data as a graph. For example, see *Figure 4.6* and *Figure 4.7*. Notice how the function key changes to Analog so you can change the display to Analog (see the next section).

NOTE: *The function key toggles from Graph to Analog to Digital and back to Graph.*

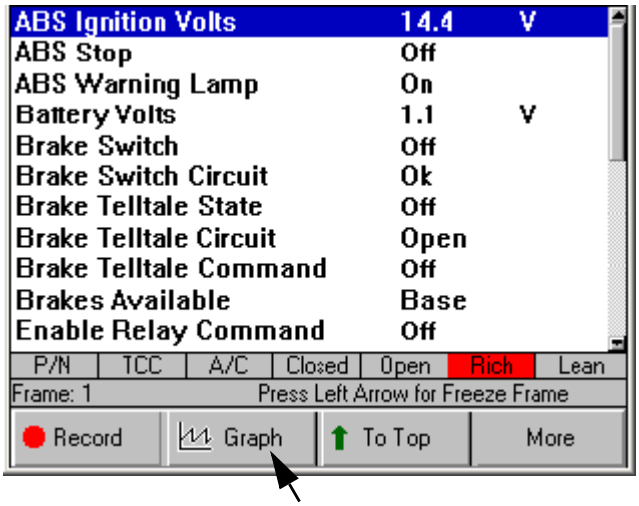


Figure 4.6: Datastream Screen - Digital Display

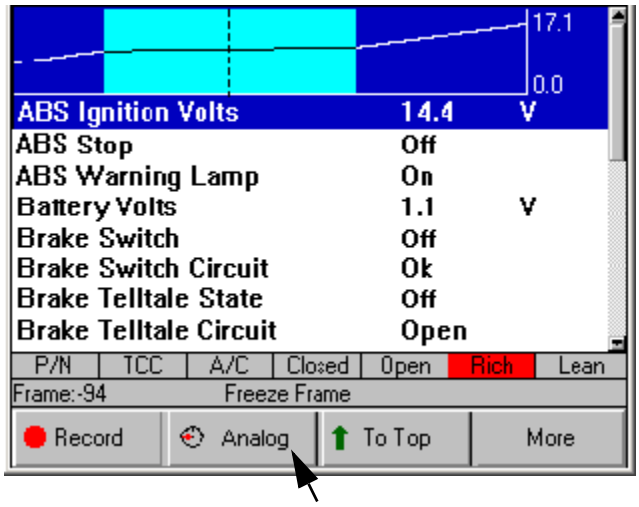


Figure 4.7: Datastream Screen - Graph Display

The graph has a past activity section and a magnified live activity window. The minimum and maximum measurements appear to the right of the graph and the digital reading is below the graph. You can use the Left and Right Direction keys to move the magnified window through the data. See **Freeze Frame** on page 27.

About Analog Display

When a selected line's data reading is displayed as a graph (see*Figure 4.7*), you can use the Analog function key to display the line's data as an Analog gauge at the top of the screen (see *Figure 4.8*). When you display the gauge, the Digital data line remains displayed in its normal position in the list. Also, the function key changes from Analog to Digital so you can change the display to back to Digital only.

You can display up to three gauges at the top of the screen. When gauges are displayed, you can temporarily "hide" them. For details, refer to **Show / Hide Analog** on page 31.

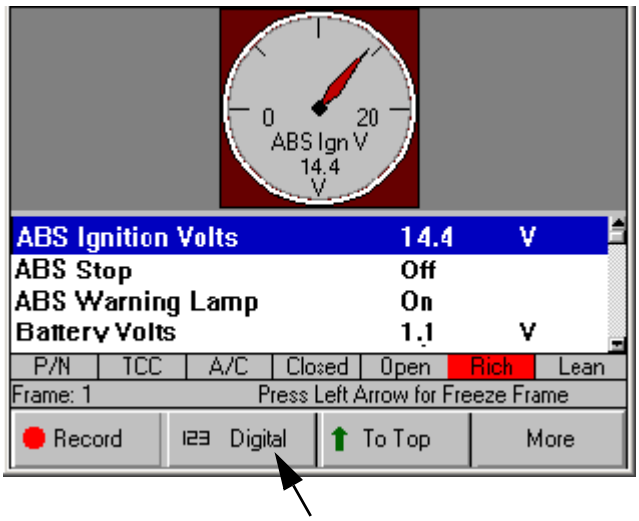


Figure 4.8: Datastream Screen - Analog Display

Lock

The Lock function lets you "lock" selected data lines so they are always included when recording and printing, even if they are below the viewable area of the screen.

NOTE: *Generally, printing and recording include only the data items within the viewable area of the data display.*

To lock data lines, follow these steps:

1 With the Datastream screen displayed, use the **Up** or **Down Direction** key to select the line to lock.

2 Press the **ENTER** key. A padlock icon appears on the left side of the line.

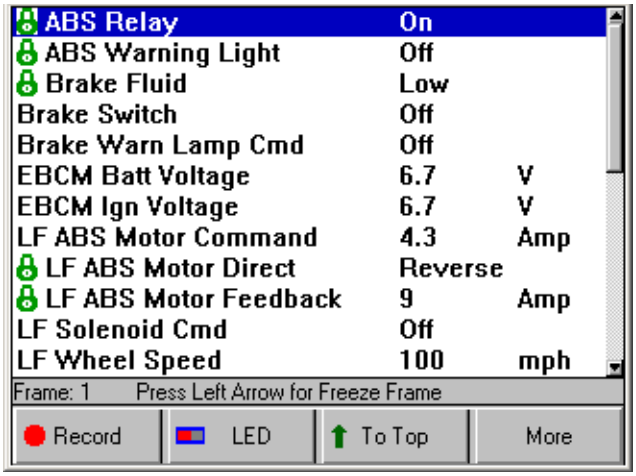


Figure 4.9: Datastream Screen - Sensor Lock Function

3 Repeat steps 1 and 2 for each line to lock.

NOTE: *The lines remain locked for the selected vehicle until you unlock them, even if you exit the software.*

4 To unlock a locked line, **select the locked line** and then press the **ENTER** key (see steps 1 and 2).

To Top

The To Top function lets you move a selected data line to the top of the Datastream screen.

NOTE: *You can also use the Sort function to rearrange the data lines. For details, refer to* ***Sort*** *on page 29.*

To move a data line to the top of the screen, follow these steps:

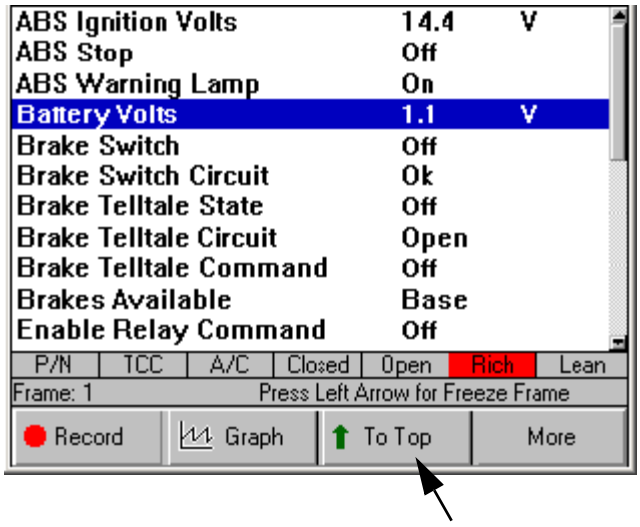


Figure 4.10: Datastream Screen - To Top Function

1 With the Datastream screen displayed, use the **Up** or **Down Direction** key to select the line to move.

2 Press the **To Top** function key. The selected line moves to the top of the screen.

3 Repeat steps 1 and 2 for each line to move.

NOTE: *Any displayed analog gauges always remain at the top of the screen. Lines moved "To Top" appear below the analog gauges.*

Freeze Frame

The Freeze Frame function lets you "freeze" the data display on the Datastream screen and lets you view past data frame-by-frame.

To "freeze" data, follow these steps:

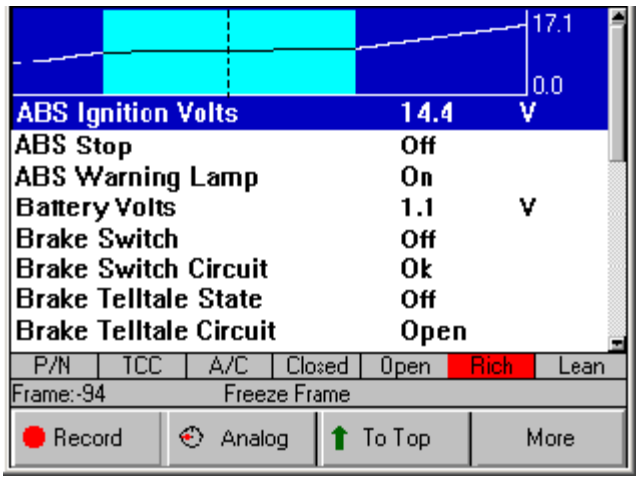


Figure 4.11: Datastream Screen - Freeze Frame Function

1 With the Datastream screen displayed, press the **Left Direction** key to begin the freeze function.

2 Repeatedly press the **Left Direction** key or press and hold the key to move backward through the data. As you do this, notice the following:

- The Frame number (above the Record key) changes to show the frame number of the currently-displayed data.
- The message next to the frame number flashes as "Freeze Frame" and "Exit to resume".
- On any displayed graphs, the vertical, dashed-line moves to display the past data for each frame.
- On any displayed digital or LED lines, or analog gauges, the data changes to display the past data for each frame.

3 Use the **Left** or **Right Direction** keys to move backward or forward through the data, frame-by-frame.

4 When finished, press the **EXIT** key to return to the normal screen display and to resume reading data.

Pathfinder

The Pathfinder function on the Datastream screen's More menu provides quick access to the Pathfinder software's menu options. With these menu options, you can view vehicle-specific information, such as DTC descriptions, technical service bulletin (TSB) references, vehicle specifications, ECU component location(s), and brake bleed procedures. You can also use this function to access the Repair Trac or Fast Fixes software from within the software.

To access the Pathfinder menu options from the Datastream screen, follow these steps:

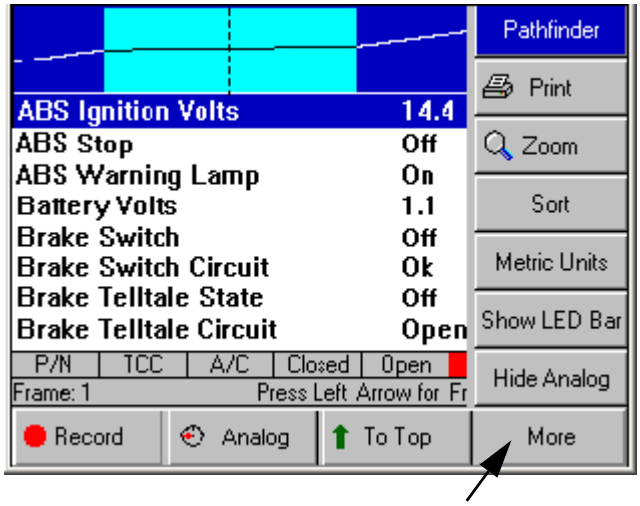


Figure 4.12: Datastream Screen - Pathfinder Function

1 With the Datastream screen displayed, press the **More** function key.

2 If necessary, use the **Up** or **Down Direction** key to select the **Pathfinder** function.

3 Press the **ENTER** key. This displays the Pathfinder screen.

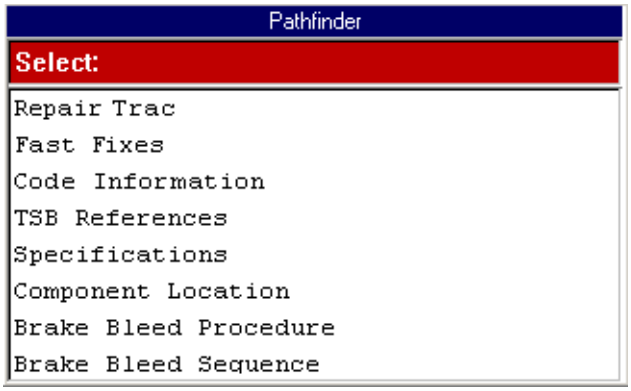


Figure 4.13: Pathfinder Screen

4 To use this screen, refer to ***8: Pathfinder*** on page 49.

Print

The Print function on the Datastream screen's More menu lets you print the data currently displayed on the screen and any data below the viewable area of the screen that is graphed or locked.

NOTE: *Refer to* ***Graph / Analog / LED / Digital*** *on page 24 and* ***Lock*** *on page 26.*

To print the data, follow these steps:

NOTE: *Before printing, a printer must be set up for printing. Refer to* ***Printing*** *on page 75.*

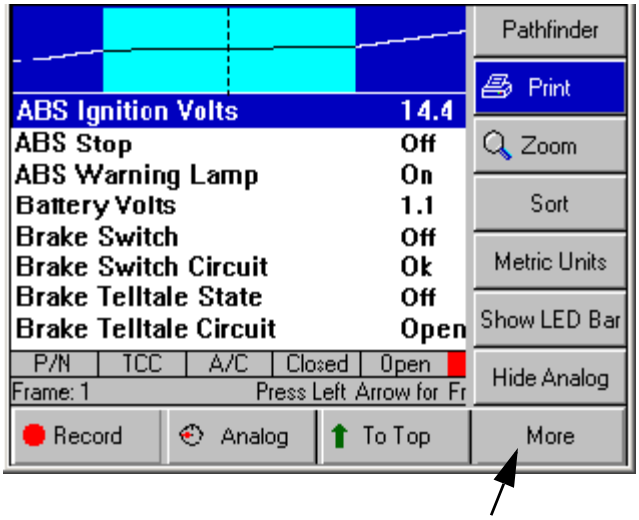


Figure 4.14: Datastream Screen - Print Function

1 With the Display Live Data screen displayed, press the **More** function key.

2 Use the **Down Direction** key to select the **Print** function.

3 The message "Print the current frame of data?" appears on a Print screen. Press the **OK** function key.

Zoom

The Zoom function on the Datastream screen's More menu lets you magnify the view of each data line on the Datastream screen.

NOTE: *This function applies to digital, graph, and LED display lines. The function can be used for the normal display or for a "frozen" display.*

To "zoom" the data lines, follow these steps:

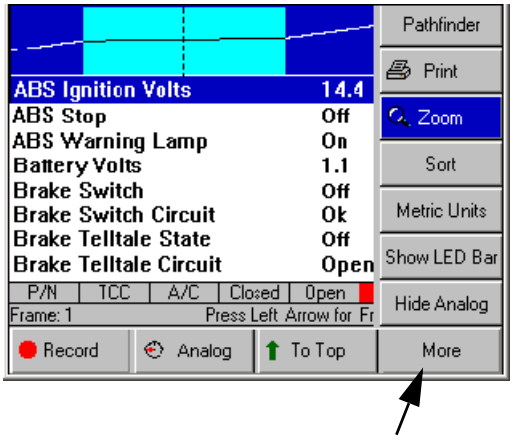


Figure 4.15: Datastream Screen - Zoom Function

1 With the Datastream screen displayed, use the **Up** or **Down Direction** key to **select the digital, LED, or graph line** to change.

2 Press the **More** function key.

3 Use the **Down Direction** key to select the **Zoom** function.

4 Press the **ENTER** key. This magnifies the selected line, as shown in *Figure 4.16*.

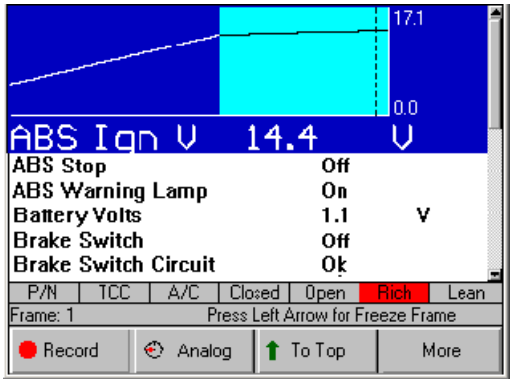


Figure 4.16: Datastream Screen - Zoom Function

5 Repeat steps 1 through 4 for each line to change.

6 To remove the "Zoom" view from a line, select the line with the "zoomed" view and then select the More, Zoom function again (see steps 2, 3, and 4).

Sort

The Sort function on the Datastream screen's More menu lets you rearrange the data on the Datastream screen alphabetically or with either locked or graphed lines at the top of the screen.

NOTE: *You can also use the To Top function to rearrange the data lines. For details, refer to* ***To Top*** *on page 26.*

To sort the data lines, follow these steps:

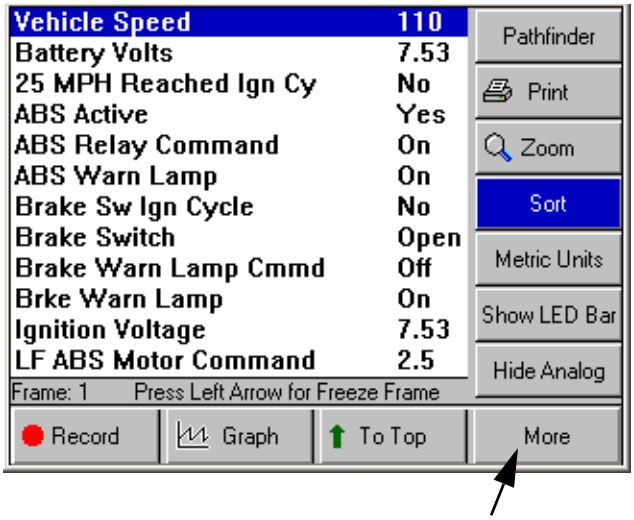


Figure 4.17: Datastream Screen - Sort Function

NOTE: *Figure 4.17 shows all graphs disabled. To use the Sort by Graphed function, one or more graphs must be displayed. To use the Sort by Locked function, one or more lines must be locked.*

1. With the Datastream screen displayed, press the **MORE** function key.
2. Use the **Down Direction** key to select the **Sort** function.
3. Press the **ENTER** key. This displays the Sort Options screen.

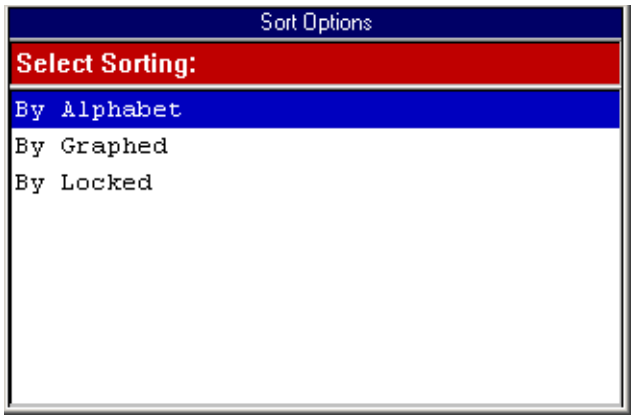


Figure 4.18: Sort Options Screen

4. From the Sort Options screen (Figure 3.18), select one of the following:
   - Select **By Alphabet** to sort the data alphabetically, or
   - Select **By Graphed** to sort the data with the graphs at the top of the screen.
   - Select **By Locked** to sort the data with the locked lines at the top of the screen.
5. After making the selection, the Datastream screen displays the rearranged lines (or graphs).

   NOTE: *Any displayed analog gauges always remain at the top of the screen.*

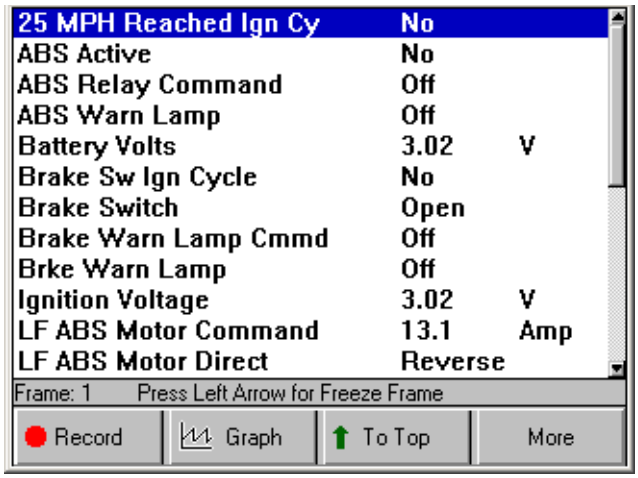


Figure 4.19: Datastream Screen - Sort by Alphabet Function

English / Metric Units

The English / Metric Units function on the Datastream screen's More menu lets you change the units of measure for the data from English to Metric, or vice versa.

To change the units of measure, follow these steps:

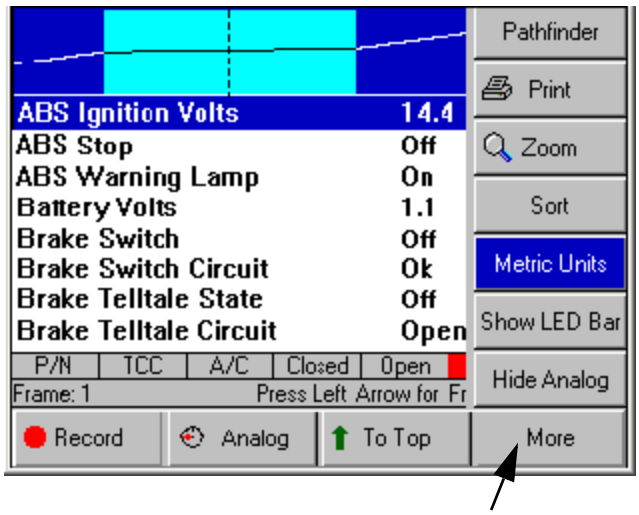


Figure 4.20: Datastream Screen - English / Metric Units Function

1 With the Datastream screen displayed, press the **MORE** function key.

2 Use the **Down Direction** key to select the **English Units** or **Metric Units** function.

NOTE: *This name of this menu option changes each time you select it. It changes back and forth between English Units and Metric Units. The name of the option represents the units of measure that will appear after you select the option.*

3 Press the **ENTER** key. This displays the data in the selected units of measure.

Show / Hide LED Bar

The Show / Hide LED Bar function on the Datastream screen's More menu lets you displays (or remove) a row of LED readings directly above the status line and function keys. The LED readings are for a predefined set of frequently monitored switches.

To show or hide the LED bar, follow these steps:

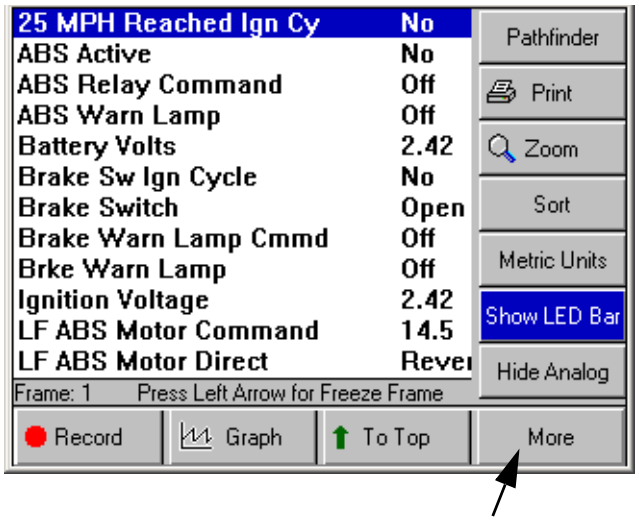


Figure 4.21: Datastream Screen - Show / Hide LED Bar Function

1 With the Datastream screen displayed, press the **MORE** function key.

2 Use the **Down Direction** key to select the **Show LED Bar** or **HIde LED Bar** function.

NOTE: *This name of this menu option changes each time you select it. It changes back and forth between Show LED Bar and Hide LED Bar. Show LED Bar displays the LED bar and Hide LED Bar removes it.*

3 Press the **ENTER** key. (See *Figure 4.22* on page 31.)

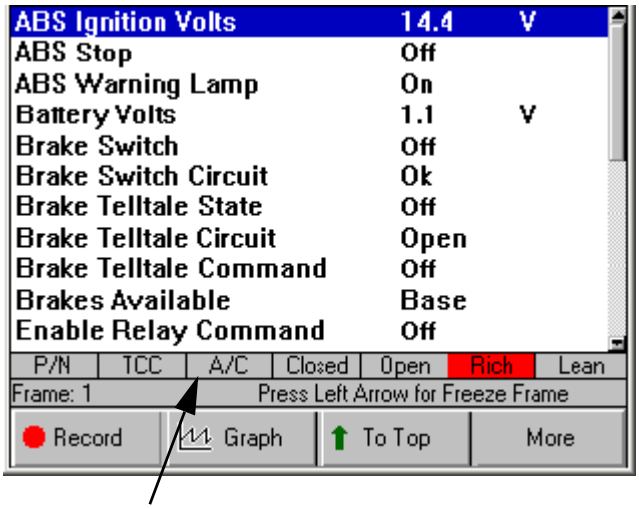


Figure 4.22: Datastream Screen - LED Bar Displayed

4 Notice the following about the LED bar:

- **P/N** is the park / neutral indicator
- **TCC** is the torque converter clutch indicator
- **A/C** is the air conditioning indicator
- **Closed** and **Open** are the operating loop indicators
- **Rich** and **Lean** are the O2 sensor indicators

Show / Hide Analog

When analog gauges are displayed at the top of the Datastream screen, the Show / Hide Analog function on the More menu lets you temporarily hide the gauges or display them again.

NOTE: *To originally display analog gauges, or to entirely turn them off, refer to* ***Graph / Analog / LED / Digital*** *on page 24.*

To hide or show the analog gauges, follow these steps:

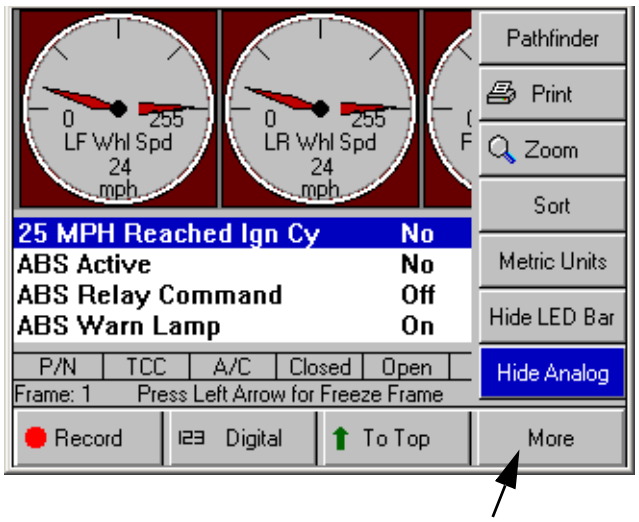


Figure 4.23: Datastream Screen - Show / Hide Analog Function

1 With the Datastream screen displayed, press the **MORE** function key.

2 Use the **Down Direction** key to select the **Hide Analog** or **Show Analog** function.

NOTE: *This name of this menu option changes each time you select it. It changes back and forth between Hide Analog and Show Analog. Hide Analog temporarily removes the gauges and Show Analog displays the gauges again.*

3 Press the **ENTER** key.

Conflict

The Conflict function on the Datastream screen's More menu lets you view detailed information when two or more power control modules (PCMs) are reading data for the same sensor or actuator, but the readings do not match (there is a conflict). This function works only when you are using Global OBD II testing and when one or more lines on the Datastream screen are red, indicating a conflict.

To view PCM conflicts, follow these steps:

1 Follow the steps in **Basic Datastream Procedure** on page 21 to display the Datastream screen.

2 Notice if the data for any line(s) are red. (If not, there are no conflicts.)

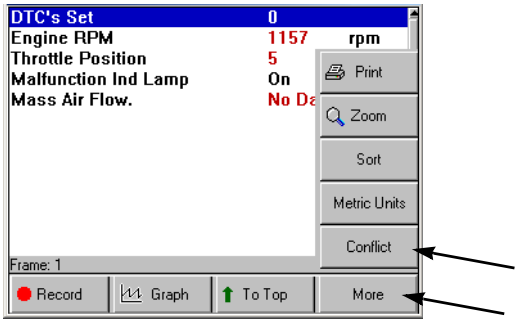


Figure 4.24: More Menu

3 Press the **More** function key.

4 Select **Conflict** and press the **ENTER** key.

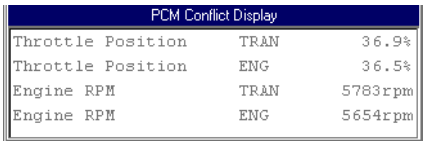


Figure 4.25: PCM Conflict Display Screen

5 The PCM Conflict Display screen lists the conflict item(s), the PCMs reading the item(s), and the readings for each PCM. Be aware of the following:

- If there is a small difference between the readings for an item, the conflict is most likely due to a timing difference of when the PCMs reported the data.
- If there is a large difference between the readings for an item, suspect a broken wire or PCM fault.

6 After viewing the items, use the **EXIT** key to return to previous screens.

Remembered Settings

When you have the Datastream screen displayed for a vehicle and you rearrange the data lines or change lines to graphs, and then exit the Datastream screen, the software automatically remembers the settings the next time you test the same vehicle. This applies to the 20 most-recently tested vehicles.

For example, if you lock certain lines or sort them, the settings will appear the next time you test the vehicle.

DTC-Triggered Recording

The scan tool has an automatic DTC-Triggered Recording function. This function works automatically and does not appear as an option on any menu. If a diagnostic trouble code (fault) occurs while you are testing a vehicle, the scan tool automatically creates a recording for playback and alerts you with a screen message. To replay these recordings, refer to ***Playback*** on page 67.

5: Custom Datastream

The Custom Datastream function lets you select specific data items to display on the standard Datastream screen.

To use the custom datastream function, follow these steps:

1 Follow the instructions in **Test Startup and Vehicle Connection** on page 14 to display the Diagnostic Menu screen.

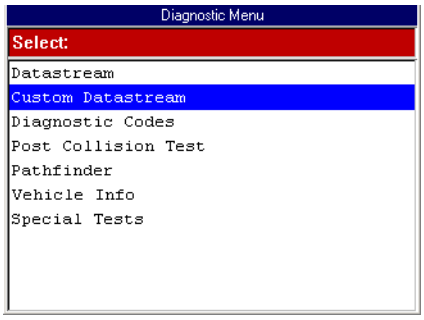


Figure 5.1: Diagnostic Menu Screen

2 Select **Custom Datastream** and press the **ENTER** key. This displays the Custom Datastream selection screen.

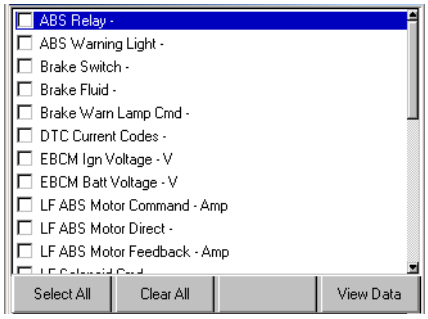


Figure 5.2: Custom Datastream Selection Screen - before selections

3 Select the data items to include in the Datastream display as follows:

a Use the **Up** and **Down Direction** key to select an item to include in the display.

b Press the **ENTER** key. A check mark appears in the box on the left side of the item.

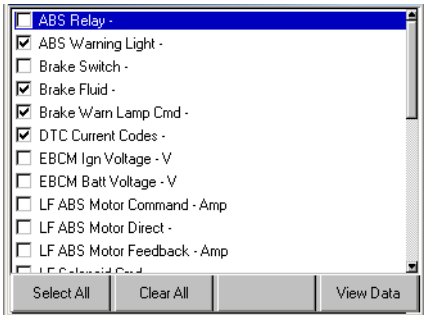


Figure 5.3: Custom Datastream Selection Screen - after selections

c Repeat **a** and **b** for each item to include in the display.

NOTE: *To deselect an item, select the item again and press the ENTER key. Optionally, use the Select All and Clear All function keys to select or deselect all of the items at once.*

4 When finished selecting data items, press the **View Data** function key to display the selected items on the Datastream screen.

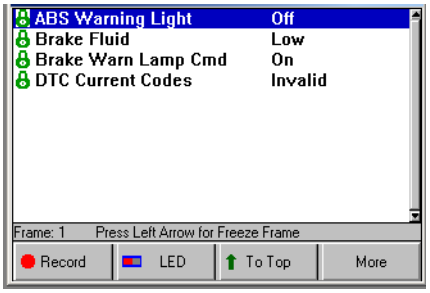


Figure 5.4: Datastream Screen

5 For details about the Datastream screen, refer to ***4: Datastream*** on page 21.

NOTES:

6: Integrated Diagnostics - Scan / Gas

The Integrated Diagnostics - Scan / Gas function lets you views sensor and switch live data readings on the same screen as exhaust gas readings (CO, CO2, HC, O2, NOX AFR).

NOTE: *The Integrated Diagnostics option works only if the Gas M-P application is unlocked with a Smart Card and the Gas M-P hardware is used. For details, refer to the Gas M-P User Guide.*

To use the integrated diagnostics function, follow these steps:

1 Follow the instructions in **Test Startup and Vehicle Connection** on page 14 to display the Diagnostic Menu screen.

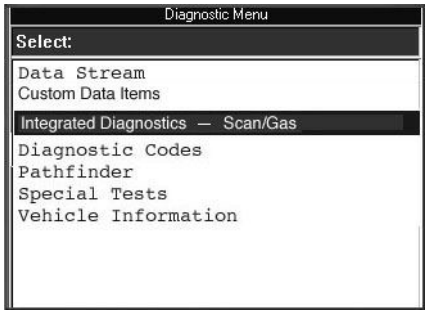


Figure 6.1: Diagnostic Menu Screen

2 Select **Integrated Diagnostics - Scan / Gas** and press the **ENTER** key.

3 Select a **data group** for viewing and press the ENTER key. This displays the Begin Zero screen.

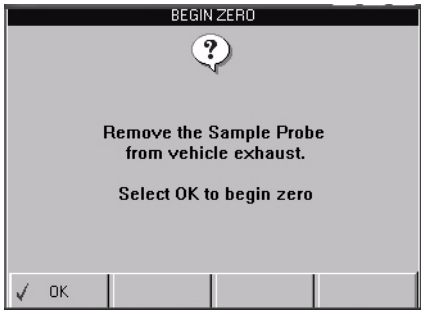


Figure 6.2: Begin Zero Screen

4 Follow the instructions on the screen and then press the **OK** function key. This "zeros" the gas module and then displays the live data readings (*Figure 6.3*).

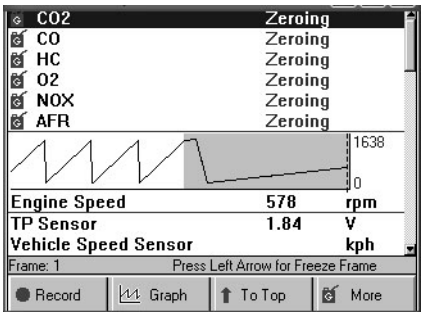


Figure 6.3: Gas and Data Display

5 Do the following to shift the gas data readings to match the datastream readings:

NOTE: *Because of the length of the vehicle exhaust system (engine to tail pipe), the exhaust gas produced in the engine at the time the data sensors read data is not measured until 9 to 14 seconds later when the exhaust gas reaches the probe that is inserted in the tail pipe. Shifting the readings puts a time delay on the sensor datastream readings so they match the gas readings.*

a "Snap" the throttle open 2 or 3 times to set a full rich condition, count the number of seconds for the HC gas value to show the rich condition.

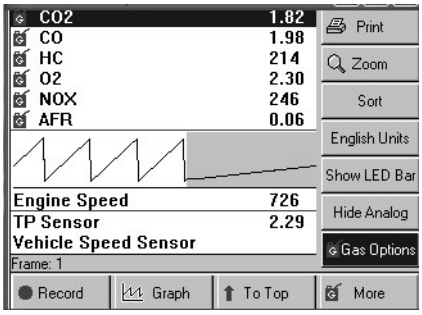


Figure 6.4: More Function Key, Gas Options

b On the scan tool, press the **More** function key, use the **Direction** key to select **Gas Options**, and press the **ENTER** key. This displays the Gas Correlation Time Shift screen (*Figure 6.5* on page 36).

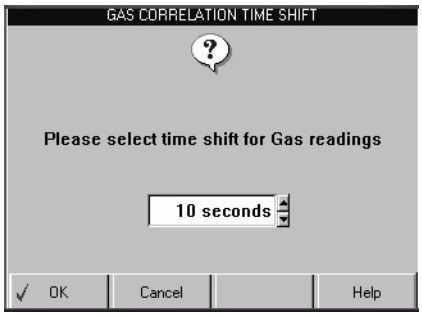


Figure 6.5: Gas Correlation Time Shift Screen

c Use the **Up** or **Down Direction** key to enter the number of seconds to shift the data (this is the number of seconds you counted in step a; 10 to 12 seconds is average).

d Press the **OK** function key to display the shifted data readings.

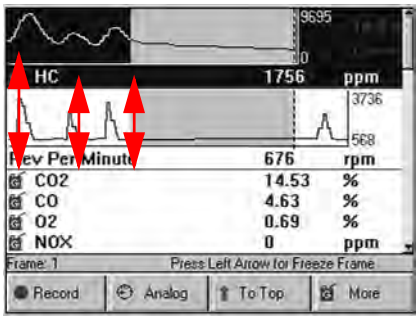


Figure 6.6: Datastream with Data Shifted and Lined Up

6 Notice the three “snaps” of the throttle align with the same three peaks in the gas data. This indicates that a time shift offset of 10 seconds is correct for this vehicle.

7 When finished viewing the data, use the **EXIT** key to return to previous screens.

7: Diagnostic Trouble Codes

Overview

The Diagnostics Trouble Codes functions let you read, review, and clear diagnostic trouble codes (DTCs) for a vehicle.

Depending on the vehicle being tested, either **Diagnostic Codes** or **Read Codes and Clear Codes** appear on the Diagnostic Menu screen as shown below in the two example screens.

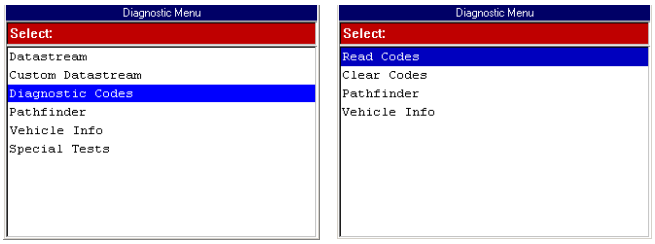


Figure 7.1: Diagnostic Menu Screen DTC Variations

Diagnostic Codes (shown on the left) appears for vehicles that allow reading of DTCs with a scan tool. Refer to the following sections in this chapter:

- **Read Codes** (next column)
- **Review Codes** on page 47
- **Clear Codes** on page 48

Read Codes and **Clear Codes** (shown on the right) appear for vehicles that require reading of DTCs by visually viewing them as “flash codes”. Refer to the following sections in this chapter:

- **Read Flash Codes** on page 46
- **Clear Codes** on page 48

NOTE: *The Scan Diagnostic applications have an automatic Diagnostic Code Triggered Record function. For vehicles with datastream access, if a diagnostic fault occurs while you are testing a vehicle, the software automatically alerts you with a screen message and creates a recording for playback. To replay these recordings, refer to* ***Playback*** *on page 67.*

NOTE: *The scan tool’s Code Library application lets you view a database of vehicle DTCs. For more information, refer to* ***Repair Information Applications*** *on page 7.*

Read Codes

The Read Codes procedure varies for each vehicle being tested. This section includes the following Read Codes procedures:

- **Read and Display Codes** (below) - this procedure reads and displays the DTCs in one procedure.
- **Read Codes Only** (page 45)- this procedure only reads the DTCs. You have to use the Review Codes procedure (page 47) to display and view codes after reading them with this procedure.
- **Flash Codes** - this procedure provides instructions for manually reading DTCs by visually viewing them as “flash codes”.

NOTE: *The System 2.0 scan tool operating system also provides quick access to the Global OBD II application if you hold down the Menu key when you turn the scan tool on.*

Read and Display Codes

Use these steps to read and display DTCs for vehicles that allow reading and displaying of codes in one procedure.

To read and display DTCs, follow these steps:

NOTE: *Before performing this procedure, make sure the vehicle’s ignition key is in the On (Run) position with the engine off.*

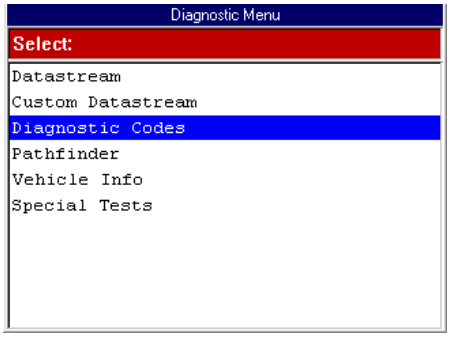


Figure 7.2: Diagnostic Menu Screen

1 With the Diagnostic Menu screen displayed, select **Diagnostic Codes** and press the **ENTER** key. This displays the Diagnostic Trouble Codes menu screen (*Figure 7.3* on page 38).

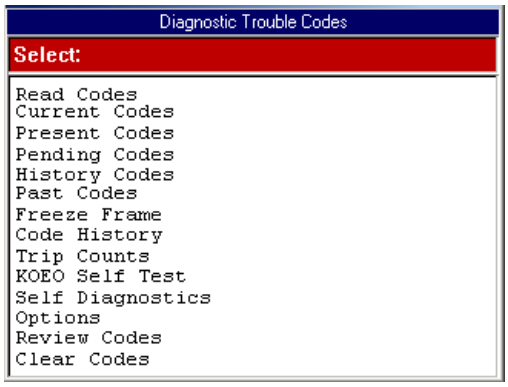


Figure 7.3: Diagnostic Trouble Codes Menu Screen Example

NOTE: *The above screen is only an example. Actual test screens vary by vehicle.*

2 **Select one** of the options that may appear on the Diagnostic Trouble Codes screen and then press the **ENTER** key:

- **Read (or Present, Current, Permanent) Codes** — DTCs that have occurred a specified number of times and indicate a problem that requires repair.
- **Pending (Temporary) Codes** — DTCs that have occurred at least once, but have not occurred enough times to be considered "Current." (use to check recent repairs because it shows DTCs after only one drive cycle.)
- **History (or Past) Codes** — intermittent DTCs that are not currently active.
- **Freeze Frame** — datastream "snapshots" automatically recorded by the ECU that show actual data values at the time DTC(s) occurred.
- **Code History** — number of engine starts since DTC(s) were first detected (to see if they are current or intermittent).
- **Trip Counts** — number of "trips" since DTCs were last cleared.
- **KOEO** — Key-on, engine-off, DTC-reading function that lets you read MECS slow codes (without descriptions).
- **Self Diagnostics** — lets you manually activate system tests that check for DTCs; Usually includes a KOEO test and a KOER (key-on, engine-running) test.
- **Options** — lets you test the function of the output relays and lets you do a "wiggle" test to check for intermittent breaks in circuitry.

3 Do one of the following:

- If the Read Codes menu screen appears (*Figure 7.4*), go to step 4.
- If the DTC Information screen appears (*Figure 7.5*), go to Step 6.
- If the Freeze Frame Selection screen appears, go to **Freeze Frame (OBD II** on page 39.
- If the Code History screen appears, go to **Code History (Chrysler/Jeep)** on page 40.
- If the Trip Counts screen appears, go to **Trip Counts (Chrysler/Jeep)** on page 40.
- If the KOEO screen appears, go to **KOEO Self Test (Ford / Mazda)** on page 41.
- If the Self Diagnostics screen appears, go to **Self-Diagnostics (Ford / Mazda)** on page 41.
- If the Options screen appears, go to **Options (Ford)** on page 42.

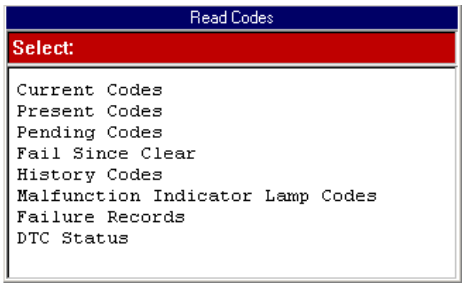


Figure 7.4: Read Codes Menu Screen Example

NOTE: *The above screen is only an example. Actual test screens vary by vehicle.*

4 **Select one** of the following options that may appear on the Read Codes screen and then press the **ENTER** key:

- **Current (or Present or Permanent) Codes —** DTCs that have occurred a specified number of times and indicate a problem that requires repair.
- **Pending (or Temporary) Codes —** DTCs that have occurred at least once, but have not occurred enough times to be considered "Current." (use to check recent repairs because it shows DTCs after only one drive cycle.)
- **Fail Since Clear —** current and pending DTCs that have occurred since the last time DTCs were cleared from the ECU.
- **History (or Past) Codes —** DTCs that have occurred intermittently and are not currently active.
- **Malfunction Indicator Lamp —** MIL codes, which are DTCs for the check engine light.

- **Failure Records —**datastream “snapshots” automatically recorded by the ECU that show actual data values at the time DTC(s) occurred
- **DTC Status —** information about DTCs that have occurred a predetermined number of times, such as pass or fail this ignition cycle, times failed, etc.

5 Do one of the following:

- If the DTC Information screen appears (*Figure 7.5*), go to step 6.
- If the Failure Records Selection screen appears. Go to **Failure Records (GM / Saturn / Isuzu)** on page 44.
- If the GM DTC Status Selection screen appears. Go to **DTC Status (GM / Saturn / Isuzu)** on page 45.

NOTE: *If there are no DTCs, a message appears to tell you this.*

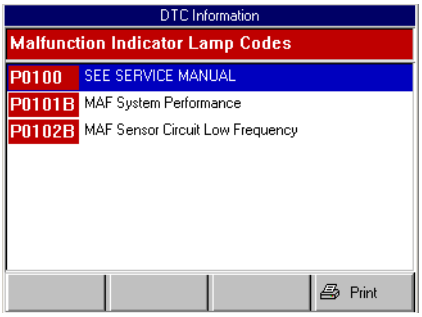


Figure 7.5: DTC Information Screen

NOTE: *GM codes are generally listed as A, B, C, or D in order of importance for repair.*

6 View the DTC list and optionally print it.

NOTE: *For some vehicles, the DTC Information screen has a Pathfinder function key. This function key lets you access the Pathfinder function from within the scan diagnostic application. For details, refer to* ***8: Pathfinder*** *on page 49.*

7 When finished viewing the list, use the **EXIT** key to return to previous screens.

NOTE: *Use the Clear Codes function to erase the codes from a vehicle’s ECU. For details, refer to* ***Clear Codes*** *on page 48.*

Freeze Frame (OBD II

The Freeze Frame function lets you view datastream “snapshots” that were automatically recorded by the ECU when one or more DTCs occurred. By viewing the actual data values from the time of a fault, you may be able to determine what caused the fault.

1 Follow the steps in **Read and Display Codes** on page 37 to display the Freeze Frame Selection screen.

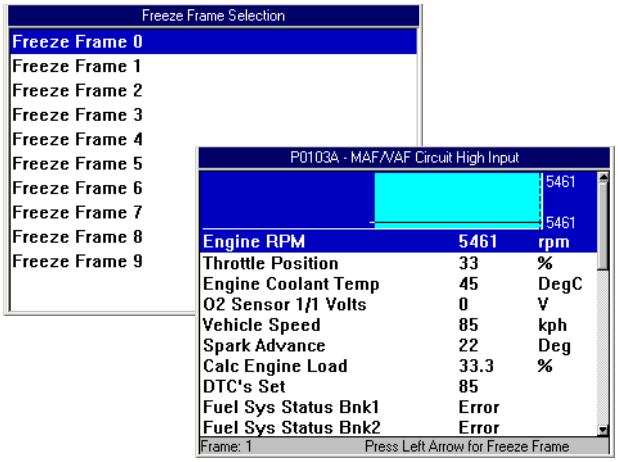


Figure 7.6: Freeze Frame Selection Screen and DTC Freeze Frame Screen.

2 **Select a Frame** and press the **ENTER** key to display the snapshot data (shown above).

NOTE: *Each frame contains a snapshot from when a DTC occurred.*

3 Use the **EXIT** key to return to previous screens.

Code History (Chrysler/Jeep)

The Code History function shows how many times the engine has been started since each fault was first detected. From this information, you can determine if a DTC is current or intermittent.

1 Follow the steps in **Read and Display Codes** on page 37 to display the Diagnostic Trouble Code History screen.

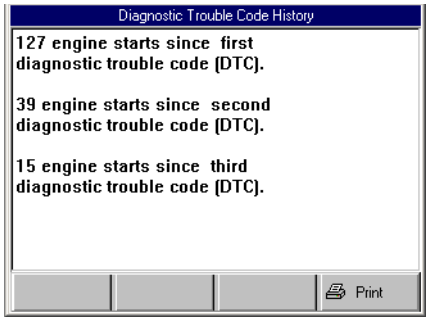


Figure 7.7: Diagnostic Trouble Code History Screen

2 View the list and optionally print it.

3 Be aware of the following:

- The “first” DTC in the list is the oldest.
- The number of engine starts (cycles) is since the code was first detected.
- If engine starts is 1, the DTC occurred during the last ignition cycle and is current.
- If engine starts is 2 or more, the code is present as an intermittent code, but is not current.
- If no codes are found, a number shows how many engine starts have occurred (up to 255 times) since the codes were last cleared.

4 When finished, use the **EXIT** key to return to previous screens.

Trip Counts (Chrysler/Jeep)

The Trip Counts function tells you how many “trips” have occurred since the DTCs were last cleared.

1 Follow the steps in **Read and Display Codes** on page 37 to display the Trip Counts screen.

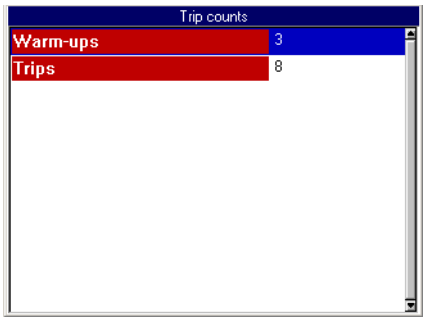


Figure 7.8: Trip Counts Screen

2 Be aware of the following:

- Warm-ups are the number of times the engine has reached operating temperature.
- Trips are the number of times the engine has been warmed-up and driven long enough to meet critical system conditions.

3 When finished, use the **EXIT** key to return to previous screens.

KOEO Self Test (Ford / Mazda)

The KOEO Self Test is a key-on, engine-off, DTC-reading function that lets you read MECS slow codes, without descriptions, for the selected ECU.

NOTE: *This test may require special cables and adapters.*

1 Follow the steps in **Read and Display Codes** on page 37 to start the self test.

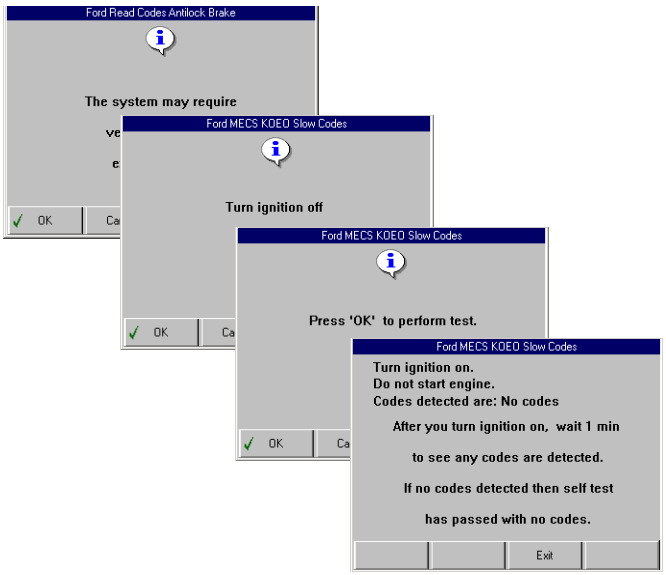


Figure 7.9: Information or Instruction Screens

2 Several instruction screens appear. Read the screens and follow all instructions. If necessary, use the **function keys** to answer any questions. Do this until the "Test completed" screen appears.

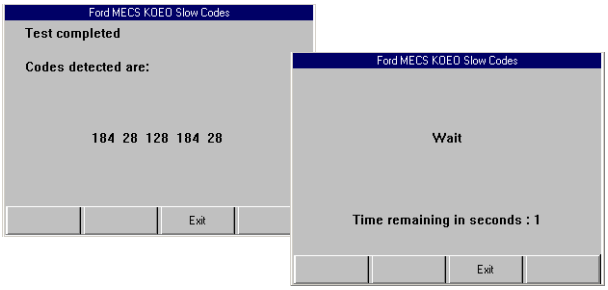


Figure 7.10: Read Codes Test and Instruction Screens

3 Press the **Exit** function key and wait for the Diagnostic Menu screen to appear.

NOTE: *Use the Review Codes function to view a list of any codes that were read. For details, refer to* ***Review Codes*** *on page 47.*

Self-Diagnostics (Ford / Mazda)

The Self-Diagnostic function lets you manually activate system tests that check for DTCs. The tests usually include a key-on, engine off (KOEO) test and a key-on, engine-running (KOER) test.

1 Follow the steps in **Read and Display Codes** on page 37 to display the Self Diagnostics screen.

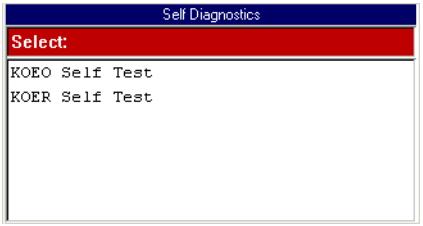


Figure 7.11: Self Diagnostics Screen

2 Select **KOEO Self Test** or **KOER Self Test** and press the **ENTER** key. This displays a test instruction screen (*Figure 7.12*).

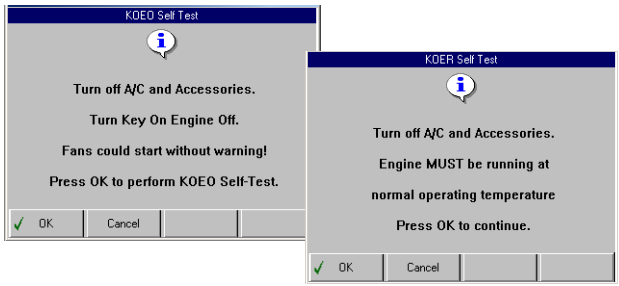


Figure 7.12: KOEO and KOER Self Test Instruction Screens

3 Follow the instructions on the screen and press the **OK** function key to start the test.

⚠ WARNING: Maintain adequate clearance around moving components or belts during testing. Moving components and belts can catch loose clothing, body parts, or test equipment and cause serious damage or personal injury.

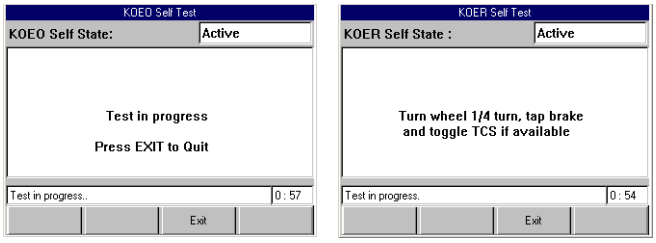


Figure 7.13: KOEO an KOER Self Test Screens

4 Wait for the test to start. While the test runs, the State (of the actuators) remains active, any special instructions appear on the screen, and a timer counts down the time remaining for the test.

5 Follow any instructions that appear on the screen and wait for the test to complete. When the test is complete, the list of DTCs appears on the DTC Information screen.

NOTE: *If the DTC list does not appear within 15 seconds, press the EXIT key and restart the test.*

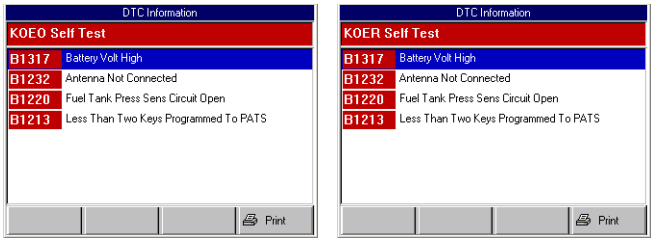


Figure 7.14: KOEO and KOER DTC Information Screens

NOTE: *The KOEO DTC list includes previous codes stored in the ECU (Current Codes or Keep Alive Codes) and codes detected at the time of the test (On-Demand Codes or Hard Fault Codes).*

6 View the DTC list and optionally print it.

7 When finished viewing the list, use the **EXIT** key to return to previous screens.

NOTE: *Use the Review Codes option to view the codes again; refer to* ***Review Codes*** *on page 47. To clear the codes, refer to* ***Clear Codes*** *on page 48.*

Options (Ford)

The Options function lets you test the function of the output relays and lets you do a “wiggle” test to check for intermittent breaks in circuitry. This section includes the following procedures:

- **Output State** (below)
- **Idle Air Adjust** on page 43
- **Wiggle Test** on page 43

Output State

The Output State test does a KOEO self test (see page 41) and then lets you test the state of the output relays by pressing and releasing the vehicle’s accelerator pedal.

1 Follow the steps in **Read and Display Codes** on page 37 to display the Options screen.

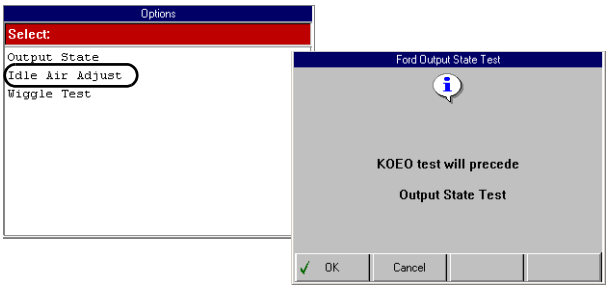


Figure 7.15: Options Screen and Output State Test Instruction Screen

2 Select **Output State** and press the **ENTER** key. This displays an instruction screen, shown above.

3 Press the **OK** function key to start the KOEO Self Test. Several instruction screens appear.

4 Read the screens and follow all instructions. If necessary, use the **function** keys to answer any questions. Do this until the “Test completed” screen appears.

5 Note any DTCs listed and press the **Continue** function key. This displays another instruction screen and then displays the Output Test State screen.

6 Follow the instructions on the Output Test State screen. Compare the actual throttle position to the Actuators state shown on the screen.

NOTE: *This test may automatically exit after 10 minutes.*

7 When finished, use the **EXIT** key to complete the test and to return to previous screens.

NOTE: *Use the Review Codes option to view the codes again; refer to* ***Review Codes*** *on page 47. To clear the codes, refer to* ***Clear Codes*** *on page 48.*

Idle Air Adjust

The Idle Air Adjust function checks the status of the base idle RPM.

1 Follow the steps in **Read and Display Codes** on page 37 to display the Options screen.

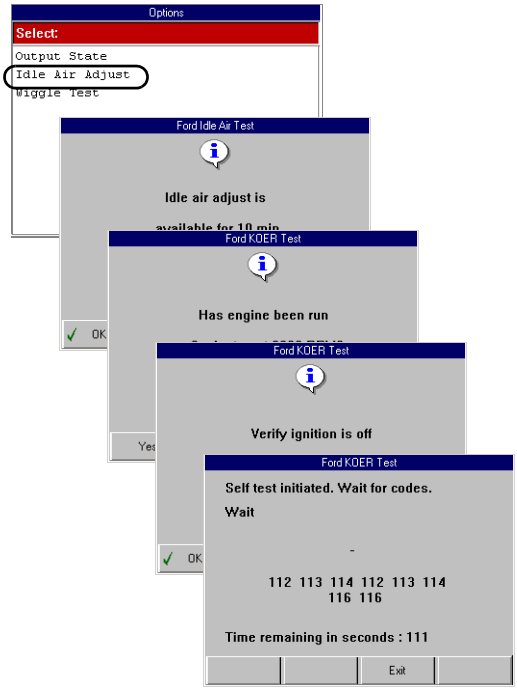


Figure 7.16: Options Screen and Idle Air Test Instruction Screens (KOER Test)

2 Select **Idle Air Adjust** and press the **ENTER** key. Several instruction screens appear (shown above).

3 Read the screens and follow all instructions. If necessary, use the **function keys** to answer any questions.

NOTE: *Use the Review Codes option to view the codes again; refer to* ***Review Codes*** *on page 47. To clear the codes, refer to* ***Read Flash Codes*** *on page 46.*

Wiggle Test

The Wiggle Test function lets you check for intermittent breaks in connections and for open or short circuits by manually wiggling vehicle wires.

1 Follow the steps in **Read and Display Codes** on page 37 to display the Options screen.

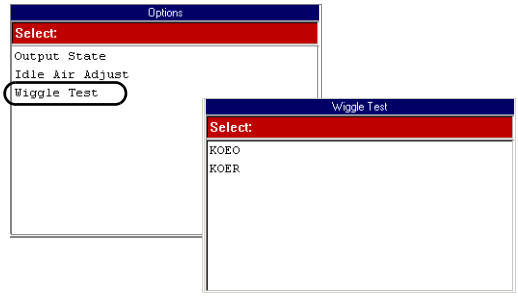


Figure 7.17: Options Screen and Wiggle Test Screen

2 Select **Wiggle Test** and press the **ENTER** key to display the Wiggle Test screen (shown above).

3 Select either **KOEO** or **KOER** to do the test with the key on and the engine either off (KOEO) or running (KOER).

4 If you select KOER, start the vehicle's engine.

5 Press the **ENTER** key. This displays an instruction screen (*Figure 7.18* on page 43).

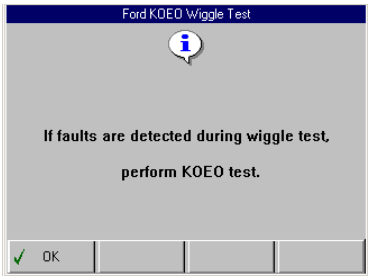


Figure 7.18: Wiggle Test Instruction Screen

6 Press the **OK** function key to continue. Several instruction screens appear.

7 Read the screens and follow all instructions. If necessary, use the **function keys** to answer any questions. Do this until the test screen appears (*Figure 7.19* on page 44).

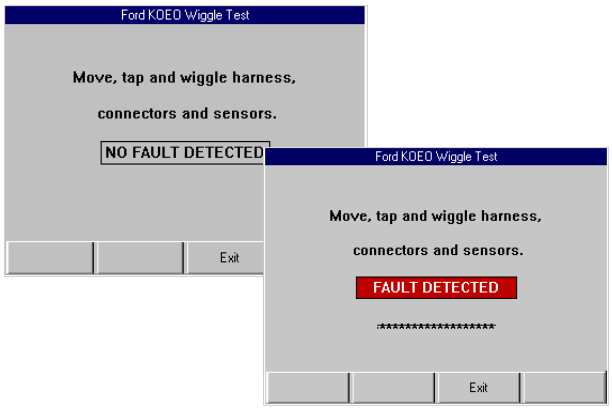


Figure 7.19: Wiggle Test Screens — No Fault and Fault Detected

8 With the test screen displayed, manually wiggle the vehicle wires and connections or drive the vehicle to recreate a suspected intermittent failure condition. If a fault is detected, the message "FAULT DETECTED" appears on the screen, as shown above.

⚠ WARNING: Maintain adequate clearance around moving components or belts during testing. Moving components and belts can catch loose clothing, body parts, or test equipment and cause serious damage or personal injury.

9 When finished, press the **Exit** function key to complete the test.

10 Use the **EXIT** key to return to previous screens.

NOTE: *When finished, do a KOEO test (see* ***Self-Diagnostics (Ford / Mazda)*** *on page 41).*

Failure Records (GM / Saturn / Isuzu)

The Failure Records function lets you view datastream "snapshots" that were automatically recorded by the ECU when DTC(s) occurred. By viewing the actual data values from the time of a fault, you may be able to determine what caused the fault.

1 Follow the steps in **Read and Display Codes** on page 37 to display the Failure Record Selection screen.

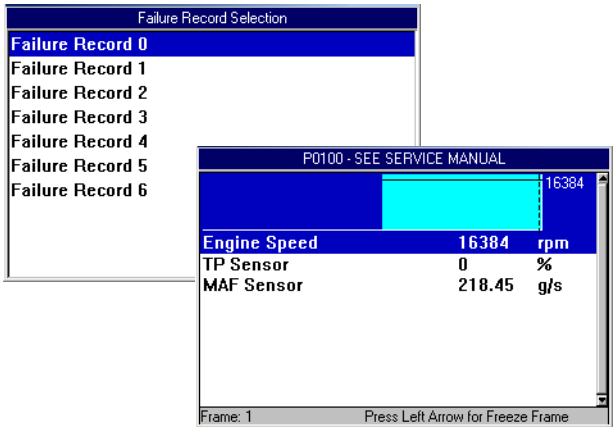


Figure 7.20: Failure Records Selection Screen and DTC Failure Record Screen

2 Select a **Failure Record** to view and press the **ENTER** key to display snapshot data (shown above).

NOTE: *Each frame contains a snapshot from when a DTC occurred.*

3 Use the **EXIT** key to return to previous screens.

DTC Status (GM / Saturn / Isuzu)

The DTC Status function lets you view information about DTCs that have occurred a predetermined number of times, such as pass or fail this ignition cycle, times failed, etc.

1 Follow the steps in **Read and Display Codes** on page 37 to display the DTC Status Selection screen.

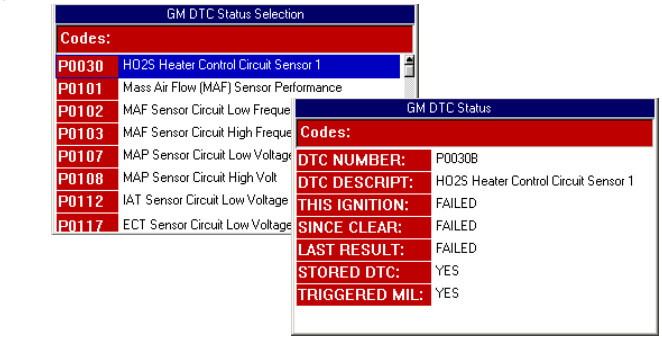


Figure 7.21: DTC Status Selection Screen and DTC Status Screen

2 Select a **DTC** for viewing details and press the **ENTER** key to display the details.

3 When finished viewing the data, use the **EXIT** key to return to previous screens.

Read Codes Only

Use these steps to read DTCs for vehicles that allow reading of codes as one procedure and viewing of codes as a separate procedure (review).

NOTE: *These steps only read the DTCs. You have to use the Review Codes procedure (page 47) to view codes after reading them with this procedure.*

To read DTCs, follow these steps:

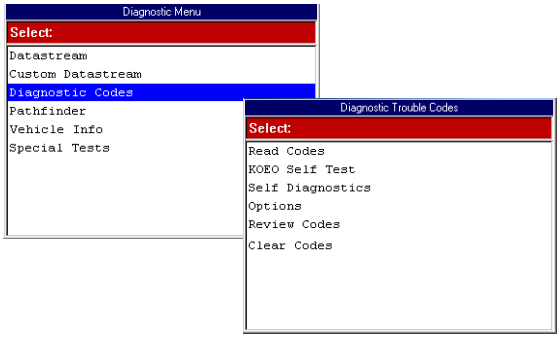


Figure 7.22: Diagnostic Menu Screen and Diagnostic Trouble Codes Screen

1 With the Diagnostic Menu screen displayed, select **Diagnostic Codes** and press the **ENTER** key. This displays the Diagnostic Trouble Codes menu screen (shown above).

2 Select **Read Codes** and press the **ENTER** key.

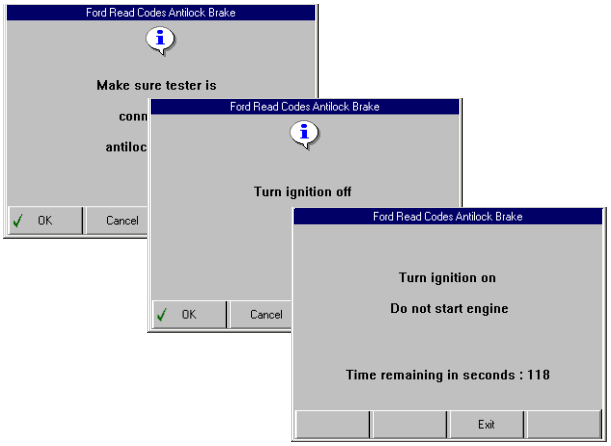


Figure 7.23: Information or Instruction Screens

3 Several instruction screens appear. Read the screens and follow all instructions. If necessary, use the **function keys** to answer any questions.

4 When finished, use the **EXIT** key to return to previous screens.

NOTE: *Refer to **Review Codes** on page 47 to view a list of codes that were read.*

Read Flash Codes

Use these steps if a vehicle requires that you read diagnostic trouble codes by visually viewing them as “flash codes”. In these steps, you identify the vehicle’s “flash code” numbers and manually enter the numbers into the scan tool to see their descriptions.

NOTE: *Flash codes are DTCs that you identify by: 1) grounding a pin on the vehicle’s check connector to trigger a specific indictor light to blink, and then 2) viewing and counting the number of times the indicator light blinks.*

To read flash codes, follow these steps:

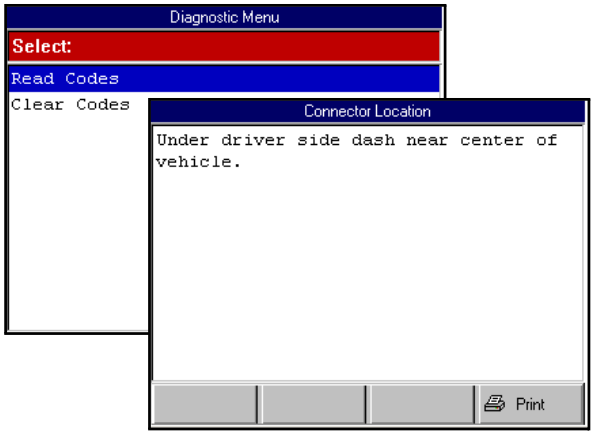


Figure 7.24: Diagnostic Menu Screen and Connector Location Screen

1 From the Diagnostic Menu screen, select **Read Codes** and press the **ENTER** key. This displays the Connector Location screen (shown above).

   NOTE: *If the Connector Location screen does not appear, go to Step 4.*

2 View the information and print it, if necessary. For printing information, refer to **Print** on page 28.

3 Press the **ENTER** key. This displays the DTC Retrieval Procedure screen.

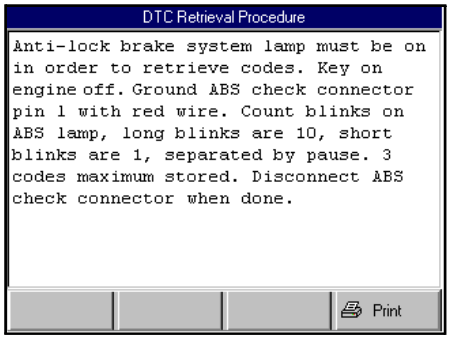


Figure 7.25: DTC Retrieval Procedure Screen

4 View the retrieval procedure and optionally print it. For printing information, refer to **Print** on page 28.

5 Use the connector location and DTC retrieval procedure to read the flash codes from the vehicle.

6 When you know the codes, press the **ENTER** key on the scan tool. This displays the Possible Codes screen.

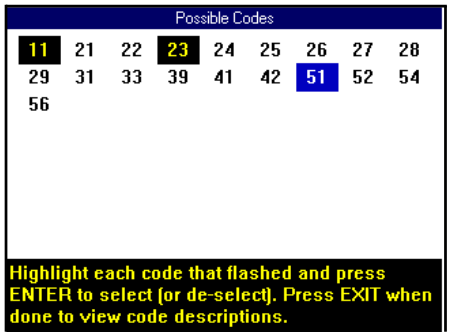


Figure 7.26: Possible Codes Screen

7 Use the Possible Codes screen to enter the flash codes as follows:

   a Use the **Direction** keys to select (highlight) a code number.

   b With the number selected, press the **ENTER** key.

   c **Repeat steps a and b** until all the flash codes are highlighted.

   d Press the **EXIT** key to display the code descriptions on the Review Codes screen.

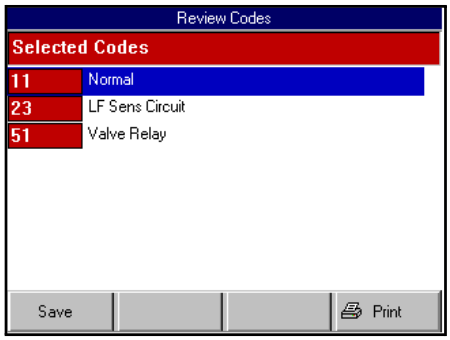


Figure 7.27: Review Codes Screen

8 View the list and optionally save or print it.
To view a saved file, refer to ***Playback*** on page 67.
For printing information, refer to **Print** on page 28.

9 Press the **EXIT** key to return to the Diagnostic Menu screen.

10 Clear the codes. Refer to **Clear Codes** on page 48.

Review Codes

The Review Codes function lets you view DTCs read from the selected ECU. This function displays DTCs only after you have used a function that reads codes, such as Read Codes, KOEO Self-Test, Self-Diagnostics, Output State Test, and Wiggle Test. Use these steps to review trouble codes after initially reading them.

To review DTCs, follow these steps:

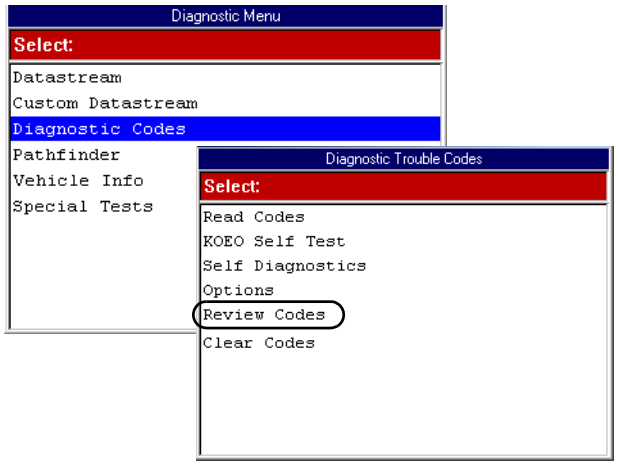


Figure 7.28: Diagnostic Menu Screen and Diagnostic Trouble Codes Screen

1 With the Diagnostic Menu screen displayed, select **Diagnostic Codes** and press the **ENTER** key. This displays the Diagnostic Trouble Codes menu screen (shown above).

2 Select **Review Codes** and press the **ENTER** key.

Figure 7.29: Review Codes Select Screen

3 If the Review Codes Select screen appears, select one of the following options, and then press the **ENTER** key to display the codes. (Otherwise, skip this step.)

- **KOEO on Demand —** displays DTCs detected at the time of a KOEO test (also called hard fault codes).
- **KOEO Keep Alive —** displays DTCs stored in the ECU before a KOEO test (also called current codes).
- **KOER —** displays codes from a KOER test.

NOTE: *If there are no codes to display, a message screen states that the code library is empty. Press the OK function key to continue.*

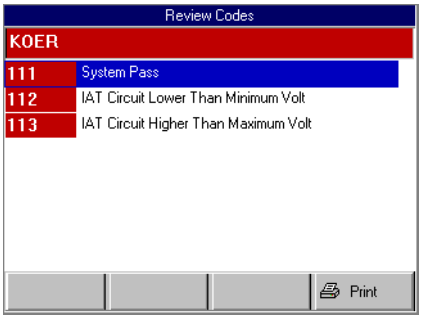


Figure 7.30: Review Codes Screen

4 View the list and optionally print it.

5 Use the **EXIT** key to return to previous screens.

NOTE: *After reviewing the codes, if necessary, clear the codes. Refer to* ***Clear Codes*** *on page 48. If necessary, consult the manufacturer's service manual for the correct "clear code" method.*

Clear Codes

After reading and / or reviewing the diagnostic trouble codes, use the following steps to clear the codes from the vehicle. If Clear Codes is not an available menu option, consult the manufacturer's service manual for the correct "clear code" method.

NOTE: *This Clear Codes function clears the DTCs from the selected ECU or provides instructions for how to manually clear the codes from the ECU.*

NOTE: *For some vehicles, this procedure also clears codes stored in the scan tool memory.*

To clear DTCs, follow these steps:

NOTE: *Before performing this procedure, make sure the vehicle's ignition key is in the On (Run) position with the engine off.*

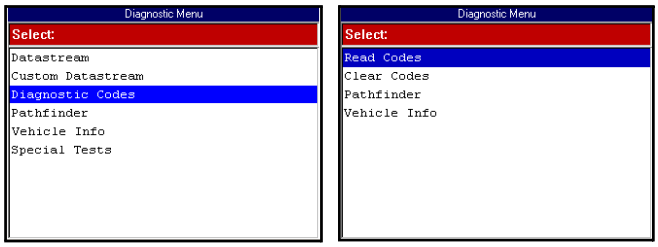


Figure 7.31: Diagnostic Menu Screen DTC Variations

1 With the Diagnostic Menu screen displayed, select either **Diagnostic Codes** or **Clear Codes** and press the **ENTER** key.

2 Do one of the following:

- If the Diagnostic Trouble Codes menu screen appears (*Figure 7.32*), go to step 3.
- If an instruction screen appears (*Figure 7.33*), go to step 4.

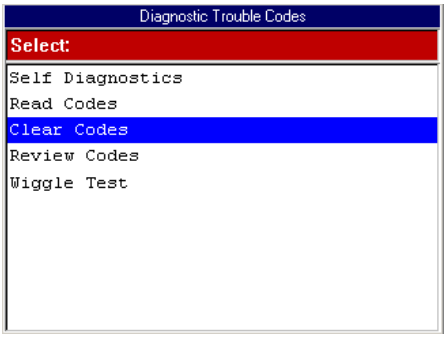


Figure 7.32: Diagnostic Trouble Codes Menu Screen

3 Select **Clear Codes** and press the **ENTER** key. This displays an instruction screen similar to those shown in *Figure 7.33*.

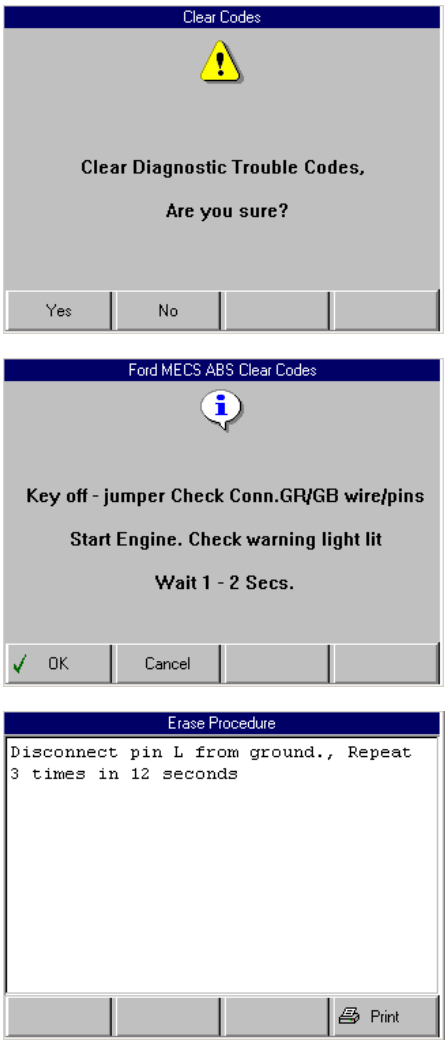


Figure 7.33: Clear Codes Instruction Screen Examples

4 Follow the instructions on each screen that appears until the procedure is complete.

NOTE: *If a screen has instructions but no function keys, press the ENTER key to continue.*

5 When finished, use the **EXIT** key to return to previous screens.

6 If the procedure provided instructions for manually clearing the codes (or an Erase Procedure), use the instructions to clear the flash codes from the vehicle.

7 Check the codes again. If any codes remain, repeat the Clear Codes steps. Make sure the vehicle's ignition key is in the On (Run) position and the engine is off.

NOTE: *GM supplemental inflatable restraint (SIR) code 52, which indicates the air bag has been deployed, cannot be cleared. All other codes clear and the SIR dash warning light turns off.*

8: Pathfinder

The Pathfinder function lets you access the Pathfinder Quick-Path software functions from within the Scan Diagnostics applications. This option lets you view vehicle-specific information for some vehicles.

NOTE: *You can also access the Pathfinder functions by doing one of the following:*

- From the Datastream screen, press the More function key and select the Pathfinder option. For details, refer to **Pathfinder** on page 27.
- From the DTC Information screen, press the Pathfinder function key. For details, refer to **Read and Display Codes** on page 37.

Basic Procedure

To access the Pathfinder functions, follow these steps:

1 Follow the instructions in **Test Startup and Vehicle Connection** on page 14 to display the Diagnostic Menu screen.

2 Select **Pathfinder** and press the **ENTER** key to display the Pathfinder screen (shown below).

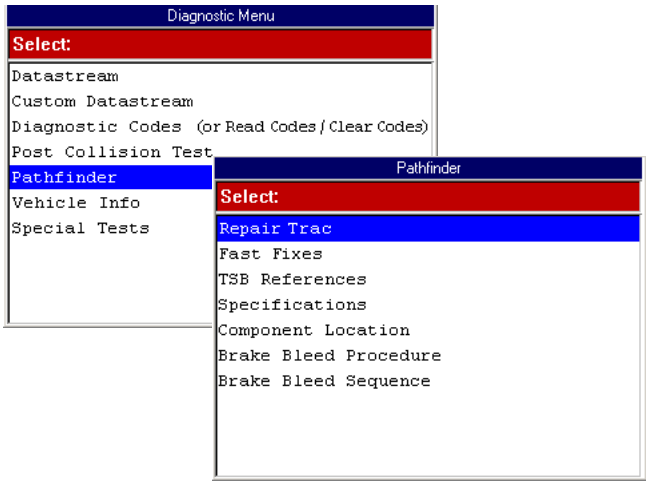


Figure 8.1: Diagnostic Menu Screen and Pathfinder Screen

3 **Select the item** to view and press the **ENTER** key.

4 Refer to the remaining sections in this chapter for specific instructions for each option on the Pathfinder screen.

Repair Trac

The Repair Trac option lets you access the Repair Trac software from within the Scan Diagnostic applications. The Repair Trac software contains repair instructions for hard-to-diagnose "pattern failures" on vehicles with 50,000 or more miles.

NOTE: *You can also access the Repair Trac software from the scan tool's Repair Information menu. If you do this, you will need to enter the vehicle information again.*

1 Follow the steps in **Basic Procedure** to display the Pathfinder screen (see *Figure 8.1*).

2 Select **Repair Trac** and press the **ENTER** key to display the Repair Trac Symptoms screen.

3 From the list of symptoms, **select a symptom to view** and press **the ENTER** key. This displays the Problems and Fixes screen (shown below).

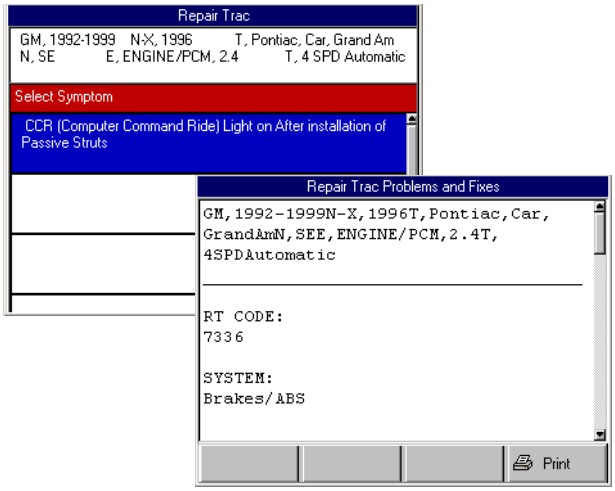


Figure 8.2: Repair Trac Symptoms Screen and Repair Trac Problems and Fixes Screen

NOTE: *The RT (Repair Trac) Code on the screen is not a part of any diagnostic trouble code (DTC).*

4 View the description and optionally print it. Refer to **Print** on page 28.

5 Use the **EXIT** key to return to previous screens.

Fast Fixes

The Fast Fixes option lets you access the Fast Fixes software from within the Scan Diagnostics applications. The Fast Fixes software contains vehicle-specific repair solutions for many “likely” or “overlooked” causes of component problems.

NOTE: *You can also access the Fast Fixes software from the scan tool’s Repair Information menu. If you do this, you will need to enter the vehicle information again.*

1 Follow the steps in **Basic Procedure** on page 49 to display the Pathfinder screen (see *Figure 8.1*).

2 Select **Fast Fixes** and press the **ENTER** key.

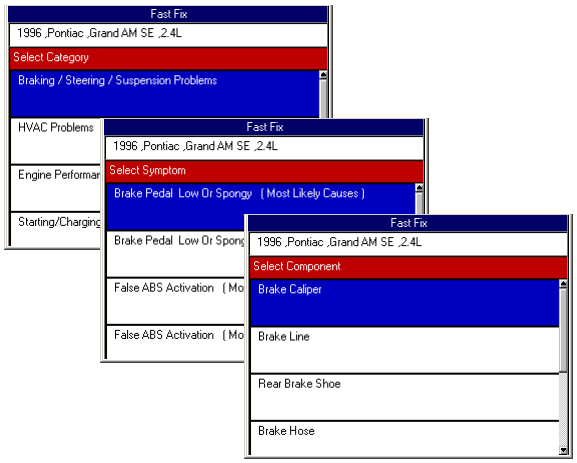


Figure 8.3: Fast Fix Select Category Screen

3 Several screens appear for selecting a category, symptom, and component. From each screen, **select an item** and then press **the ENTER** key. Do this until the Fast Fix Symptoms and Causes screen appears.

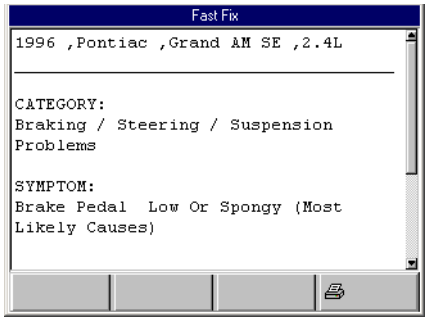


Figure 8.4: Fast Fix Symptoms and Causes Screen

4 View the description and optionally print it. Refer to **Print** on page 28.

5 Use the **EXIT** key to return to previous screens.

TSB References

The TSB References option lets you look up the numbers and titles of technical service bulletins for a vehicle.

1 Follow the steps in **Basic Procedure** on page 49 to display the Pathfinder screen (see *Figure 8.1*).

2 Select **TSB References** and press the **ENTER** key. This displays the TSB References Select TSB screen.

3 **Select a TSB to view** and press **the ENTER** key to display a description of the TSB (shown below).

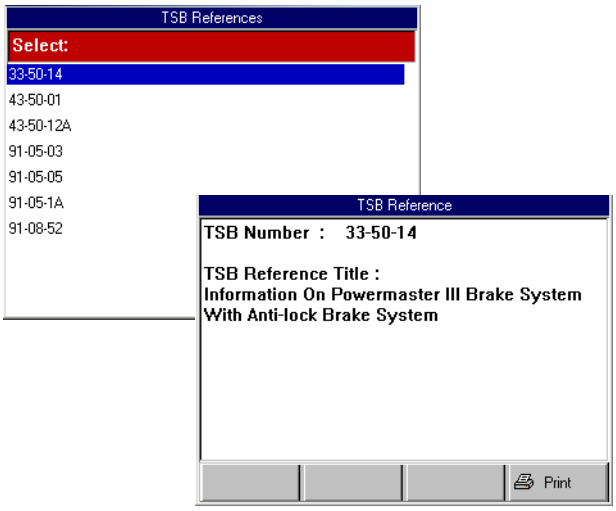


Figure 8.5: TSB Selection Screen and TSB Reference Screen

4 View the description and optionally print it. Refer to **Print** on page 28.

5 Use the **EXIT** key to return to previous screens.

Specifications

The Specifications option lets you view tune-up, engine, and system specifications for a vehicle.

1 Follow the steps in **Basic Procedure** on page 49 to display the Pathfinder screen (see *Figure 8.1*).

2 Select **Specifications** and press the **ENTER** key to display the Specifications screen.

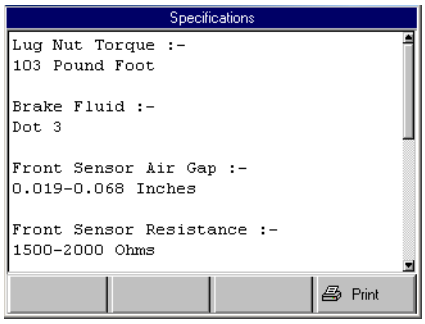


Figure 8.6: Specifications Screen

3 View the specifications and optionally print them. Refer to **Print** on page 28.

4 Use the **EXIT** key to return to previous screens.

Component Location

The Component Location option lets you view a description of the computer and connector locations for a vehicle.

1 Follow the steps in **Basic Procedure** on page 49 to display the Pathfinder screen (see *Figure 8.1*).

2 Select **Component Location** and press the **ENTER** key. This displays the Component Location screen.

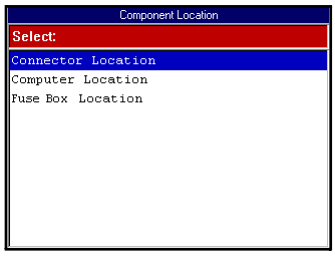


Figure 8.7: Component Location Screen

3 **Select a component** and press the **ENTER** key:

- **Connector Location** - DLC location.
- **Computer Location** - ECU location(s).
- **Fuse Box Location** - fuse box location(s).

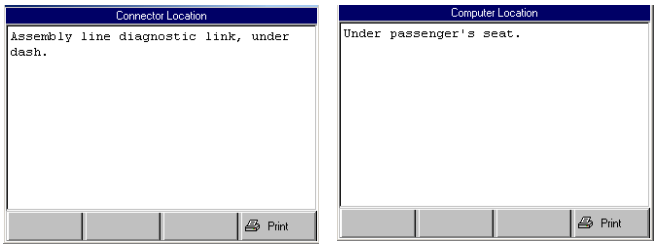


Figure 8.8: Component Location Screen Examples

4 View the description and optionally print it. Refer to **Print** on page 28.

5 Use the **EXIT** key to return to previous screens.

Brake Bleed Procedure (ABS)

The Brake Bleed Procedure option lets you view instructions for bleeding a vehicle's brakes.

1 Follow the steps in **Basic Procedure** on page 49 to display the Pathfinder screen (see *Figure 8.1*).

2 Select **Brake Bleed Procedure** and press the **ENTER** key to display the Brake Bleed Procedure screen.

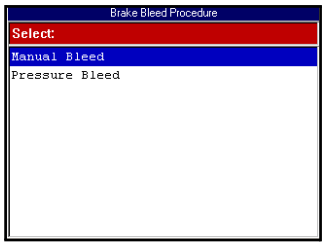


Figure 8.9: Brake Bleed Procedure Screen

3 Select either **Manual Bleed** or **Pressure Bleed** and press the **ENTER** key. This displays either the Manual Bleed Procedure screen or the Pressure Bleed Procedure screen.

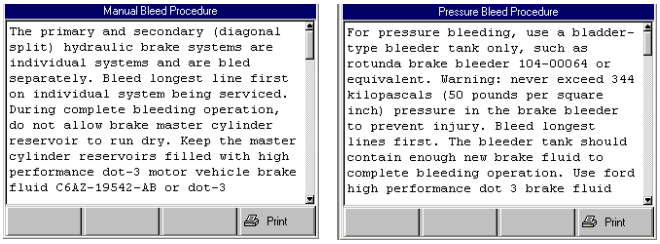


Figure 8.10: Brake Bleed Procedure Example Screens

4 View the procedure and optionally print it. Refer to **Print** on page 28.

5 Use the **EXIT** key to return to previous screens.

Brake Bleed Sequence (ABS)

The Brake Bleed Sequence option lets you view a description of the correct sequence for bleeding a vehicle's brakes.

1 Follow the steps in **Basic Procedure** on page 49 to display the Pathfinder screen (see *Figure 8.1*).

2 Select **Brake Bleed Sequence** and press the **ENTER** key to display the Brake Bleed Sequence screen.

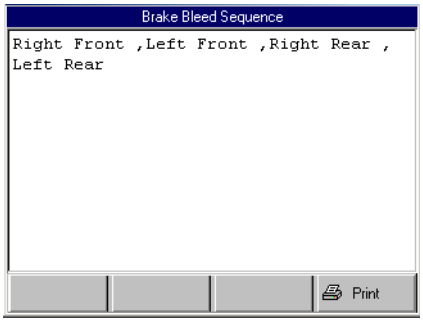


Figure 8.11: Brake Bleed Sequence Screen

3 View the description and print it, if necessary. Refer to **Print** on page 28.

4 Use the **EXIT** key to return to previous screens.

Oil Light Reset Test Procedure

The Oil Light Reset Test Procedure option lets you view a description of the oil light reset test procedure for the vehicle.

1 Follow the steps in **Basic Procedure** on page 49 to display the Pathfinder screen (see *Figure 8.1*).

2 Select **Oil Light Reset Test Procedure** and press the **ENTER** key.

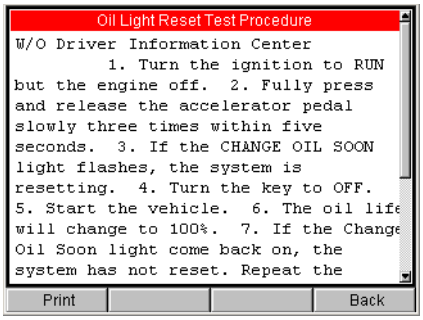


Figure 8.12: Oil Light Reset Test Procedure Screen

3 View the description and print it, if necessary. Refer to **Print** on page 28.

4 Press the **BACK** function key to return to the previous screen.

Torque Specifications

The Torque Specifications option lets you view a diagram and description of torque specifications for the vehicle.

1 Follow the steps in **Basic Procedure** on page 49 to display the Pathfinder screen (see *Figure 8.1*).

2 Select **Torque Specifications** and press the **ENTER** key.

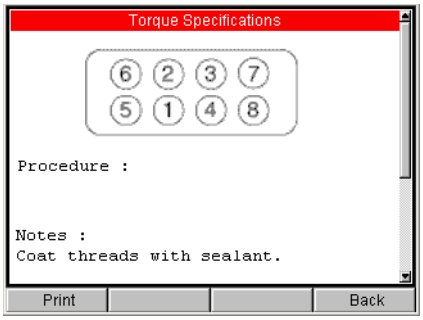


Figure 8.13: Torque Specifications Screen

3 View the description and print it, if necessary. Refer to **Print** on page 28.

4 Press the **BACK** function key to return to the previous screen.

Tune Up Specifications

The Tune Up Specifications option lets you view a description of tune up specifications for the vehicle.

1 Follow the steps in **Basic Procedure** on page 49 to display the Pathfinder screen (see *Figure 8.1*).

2 Select **Tune Up Specifications** and press the **ENTER** key.

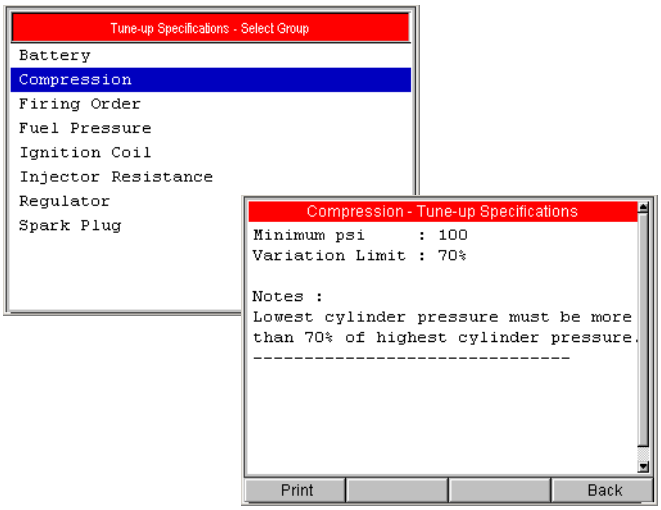


Figure 8.14: Tune-Up Specifications Screen

3 Select a **component group** and press the **ENTER** key. This displays the specifications (shown above).

4 View the description and print it, if necessary. Refer to **Print** on page 28.

5 Press the **BACK** function key to return to the previous screen.

9: Vehicle Info

The Vehicle Info function lets you view vehicle-specific information for Specifications, Related TSBs, System Type, and PROM Identification.

Basic Procedure

To access the Vehicle Info functions, follow these steps:

1 Follow the instructions in **Test Startup and Vehicle Connection** on page 14 to display the Diagnostic Menu screen.

2 Select **Vehicle Info** and press the **ENTER** key to display the Vehicle Info screen (shown below).

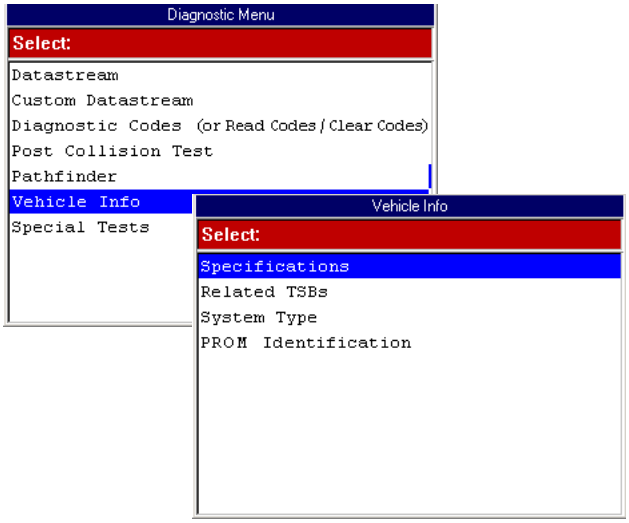


Figure 9.1: Diagnostic Menu Screen and Vehicle Info Screen

3 **Select the item** to view and press the **ENTER** key.

4 Refer to the following sections:

- **Specifications** (next column)
- **Related TSBs** on page 56
- **System Type** on page 56
- **PROM Identification (GM)** on page 56

Specifications

The Specifications option lets you view specifications for a selected control module (ECU).

1 Follow the steps in **Basic Procedure** to display the Vehicle Info screen (see *Figure 9.1*).

2 Select **Specifications** and press the **ENTER** key to display the Specifications screen.

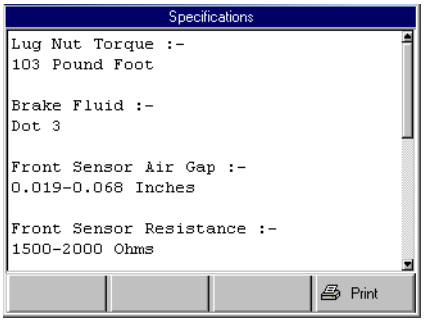


Figure 9.2: Specifications Screen

3 View the specifications and optionally print them. Refer to **Print** on page 28.

4 Use the **EXIT** key to return to previous screens.

Related TSBs

The Related TSBs option lets you look up the numbers and titles of technical service bulletins.

1 Follow the steps in **Basic Procedure** on page 55 to display the Vehicle Info screen (see *Figure 9.1*).

2 Select **Related TSBs** and press the **ENTER** key to display the TSB References screen.

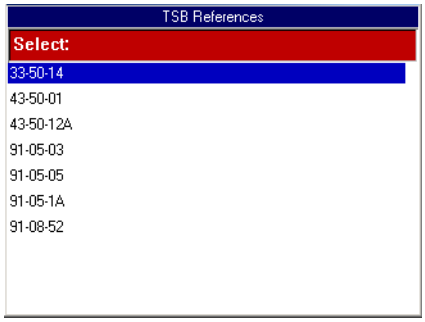


Figure 9.3: TSB References Screen

3 **Select a TSB to view** and press **the ENTER** key to display a brief description of the TSB.

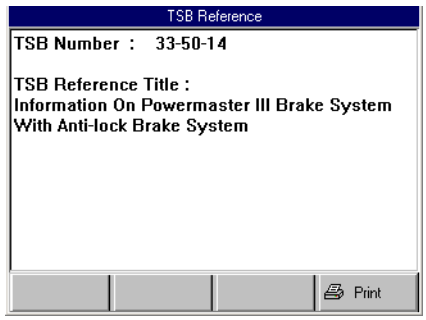


Figure 9.4: TSB Reference Screen

4 View the description and optionally print it. Refer to **Print** on page 28.

5 Use the **EXIT** key to return to previous screens.

System Type

The System Type option lets you view the vehicle description.

1 Follow the steps in **Basic Procedure** on page 55 to display the Vehicle Info screen (see *Figure 9.1*).

2 Select **System Type** and press the **ENTER** key to display the System Information screen.

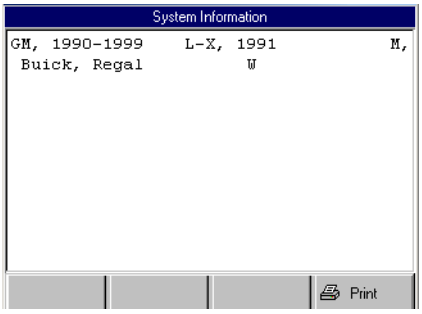


Figure 9.5: System Information Screen

3 View the information and optionally print it. Refer to **Print** on page 28.

4 Use the **EXIT** key to return to previous screens.

PROM Identification (GM)

The PROM Identification option lets you view the Programmable Read Only Memory (PROM) 4-digit identification number and additional PROM-related information.

1 Follow the steps in **Basic Procedure** on page 55 to display the Vehicle Info screen (see *Figure 9.1*).

2 Select **PROM Identification** and press the **ENTER** key to display the PROM Identification screen.

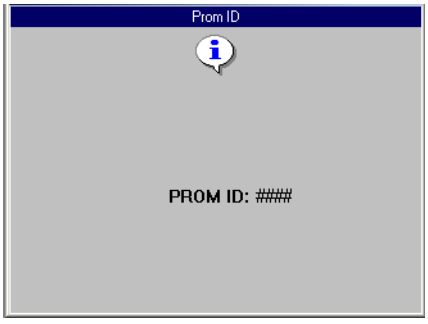


Figure 9.6: PROM ID Screen

3 View the information and print it, if necessary. Refer to **Print** on page 28.

4 Use the **EXIT** key to return to previous screens.

10: PROM ID / Controller ID

PROM ID (GM)

For some GM vehicles, the Programmable Read-Only Memory Identification (PROM ID) function displays the PROM ID number and any additional PROM related information that is stored in the selected electronic control unit (ECU).

To display the PROM ID information, follow these steps:

1 Follow the instructions in **Test Startup and Vehicle Connection** on page 14 to display the Diagnostic Menu screen.

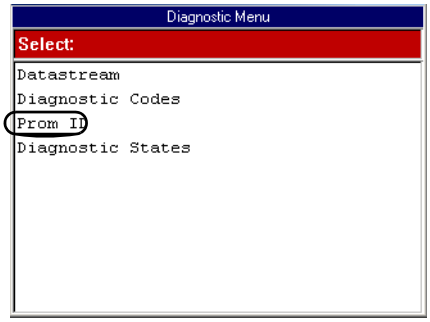


Figure 10.1: Diagnostic Menu Screen

2 Select **Prom ID** and press the **ENTER** key.

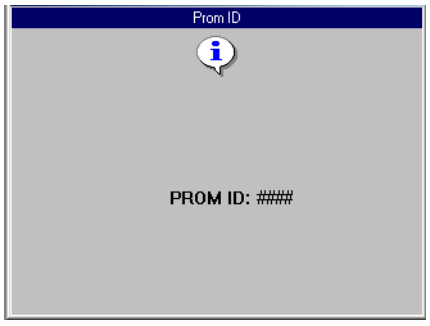


Figure 10.2: Prom ID Screen

3 View the information.

4 Use the **EXIT** key to return to previous screens.

Controller ID

The Controller ID function displays identification information about the selected ECU (Audi and Volkswagen).

To display the Controller ID information, follow these steps:

1 Follow the instructions in **Test Startup and Vehicle Connection** on page 14 to display the Diagnostic Menu screen.

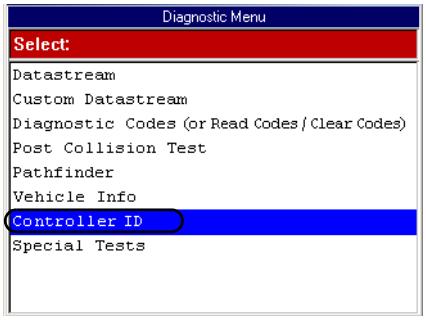


Figure 10.3: Diagnostic Menu Screen

2 Select **Controller ID** and press the **ENTER** key. This displays the ECU Identification Data screen.

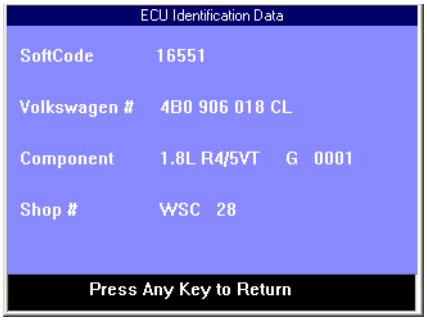


Figure 10.4: ECU Identification Screen

3 View the data.

4 When finished, use the **EXIT** key to return to previous screens.

NOTES:

11: Diagnostic States (GM)

For some older GM vehicle engine ECUs, the Diagnostic States function lets you place a vehicle in special test modes (states). The Road Mode is normally used for diagnostic testing and three additional modes are available to check codes, serve as a backup fuel setting, or function as a service setting as follows:

- **Road Mode —** should be used whenever possible to diagnose driveability problems. This mode does not include a preset test idle speed or additional advance.
- **Field Service Mode —** grounds the vehicle diagnostic link and triggers the check engine indicator light to flash. From the number and speed of the flashes, you can determine DTCs and the current state of the Oxygen (O2) sensor.
- **Back-Up Fuel Mode** (also called limp-in mode) **—** keeps a disabled vehicle running until it can be repaired. This mode supplies injector pulses to the fuel injectors and sets base timing if the Programmable Read Only Memory (PROM) chip fails. Vehicle service manuals refer to this mode as “3.9 K Ohm State” or “Factory Test State.” (You cannot view sensor or switch data in this mode.)
- **ALCL Mode —** automatically sets a test idle speed and additional ignition advance if Road Test data is unavailable or unreliable. Vehicle service manuals refer to this mode as “10 K Ohm State” or “Special State.”

1 Follow the instructions in **Test Startup and Vehicle Connection** on page 14 to display the Diagnostic Menu screen.

2 Select **Diagnostic States** and press the **ENTER** key to display the Diagnostic States screen (shown below).

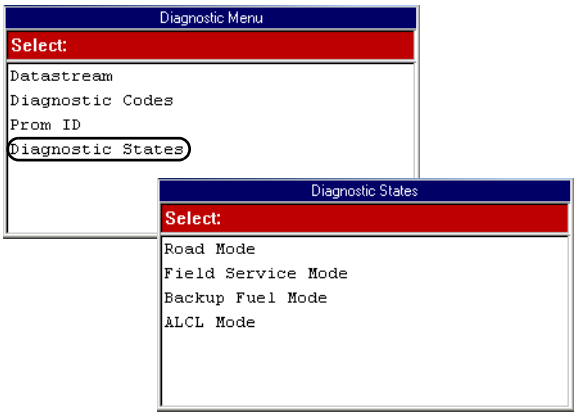


Figure 11.1: Diagnostic Menu Screen and Diagnostic States Screen

3 Select a **Mode** and press the **ENTER** key.

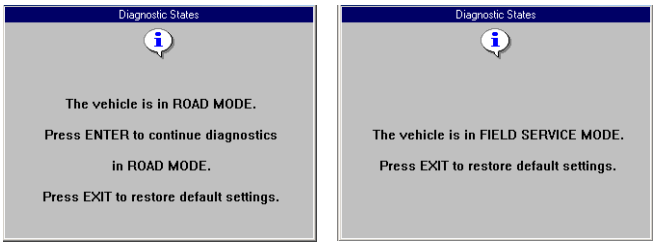


Figure 11.2: Diagnostic States Screens (Road Mode and Field Service Mode)

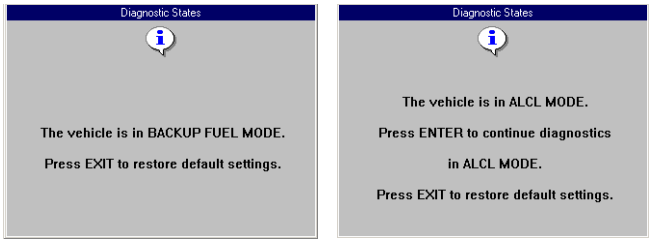


Figure 11.3: Diagnostic States Screens (Backup Fuel Mode and ALCL Mode)

4 Press the **ENTER** key to set the mode.

5 Perform the necessary diagnostic tests.

6 If you select Field Service Mode, do the following to read the DTCs and the Oxygen (O2) sensor state:

- To read **DTCs**, turn the vehicle key on (engine off) and consult the vehicle service manual to interpret the light flashes.
- To read the **oxygen (O2) sensor state**, start the engine and count how many times the check engine light flashes per second (one or two) and notice if the light is on longer than it is off, or vice versa. Interpret the flashes as follows: one flash per second indicates closed loop and two flashes per second indicates open loop; light on longer than off indicates rich running engine; light off longer than on indicates lean running engine; light on and off equal times indicates ideal running engine (14.7 to 1 air/fuel ratio).

NOTES:

12: Post Collision Test (Airbag)

The Post Collision Test function is a preset test for testing air bags after repair.

NOTE:

To perform a Post Collision Test, follow these steps:

1 Perform the steps in **Test Startup and Vehicle Connection** on page 14 to enter the vehicle information and display the Diagnostic Menu screen.

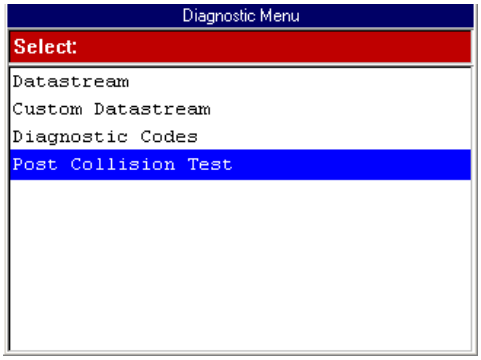


Figure 12.1: Diagnostic Menu Screen

NOTE: *For some vehicles, the Post Collision Test option may be available only after first selecting Diagnostic Codes. The option then appears on the Diagnostic Trouble Codes menu screen.*

2 Select **Post Collision Test** and press the **ENTER** key. This displays an instruction screen.

Figure 12.2: Post Collision Test Screen

3 Read the screen, follow the instructions, and press the **ENTER key.**

4 After this, several instruction screens appear. Read the screens and follow all instructions. Do this until the Diagnostic Trouble Codes menu screen appears.

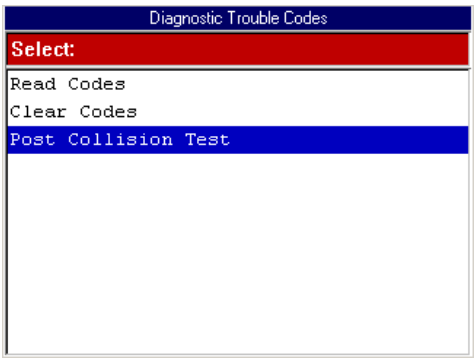


Figure 12.3: Diagnostic Trouble Codes Menu Screen

5 Do one of the following:

- If the SIR warning lamp is off, the procedure is complete. Use the **EXIT** key to return to previous screens.
- If the SIR warning lamp is on, continue with the next step.

6 Select **Read Codes** from the Diagnostic Trouble Codes menu screen and press the **ENTER** key.

NOTE: *If the Read Codes menu screen appears, select* ***Current Codes*** *from the menu and press the* ***ENTER*** *key.*

This displays the DTC Information screen.

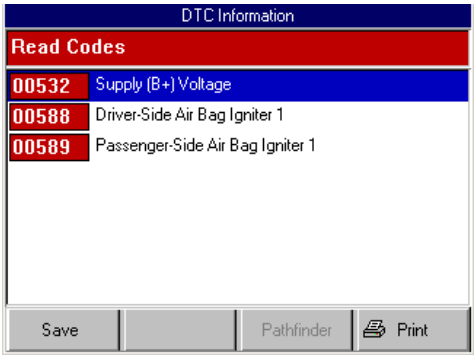


Figure 12.4: DTC Information Screen

7 View the list and save or print it, if necessary. To view a saved file, refer to **Playback** on page 67. For printing information, refer to **Print** on page 28.

NOTE: *For more information about DTCs and the DTC Information screen, refer to* ***7: Diagnostic Trouble Codes*** *on page 37.*

8 Use the **EXIT** key to return to previous screens.

9 If necessary, use the Clear Codes function to erase the codes from the vehicle's ECU. For details, refer to **Clear Codes** on page 48.

10 Do any further air bag repairs and repeat the test.

NOTES:

13: Special Tests

Overview

The Special Tests function lets you perform special bi-directional diagnostic tests on vehicle systems and components. The tests let you use the scan tool to activate or control the system components.

NOTE: *During a test, you use the tool to temporarily control a selected component. When you exit the test, the component returns to the normal setting.*

This chapter includes a basic procedure for doing the special tests, brief descriptions of the special tests, and examples of common special test screens.

NOTE: *While performing a special test, a Fault Code Detected screen may appear indicating a fault exists. Repair the problem and clear the diagnostic test code(s) before continuing the special test. For details about clearing codes, refer to* ***Diagnostic Trouble Codes*** *on page 37.*

NOTE: *The software has an automatic Diagnostic Code Triggered Record function. If a diagnostic fault occurs while you are testing a vehicle, the software automatically alerts you with a screen message and creates a recording for playback. To replay these recordings, refer to* ***Playback*** *on page 67.*

⚠ WARNING: Before performing any tests, refer to the Safety Precautions and instructions provided in this User Guide and the warnings provided by the vehicle manufacturer. In addition, follow any warnings and descriptions provided on the scan tool screens.

⚠ WARNING: During active testing, bi-directional component activation is automatically "inhibited" when required to allow components adequate time to cool down. Do not bypass this cool-down period by restarting the test or by using any other means of bypassing the cool-down period.

Basic Special Test Procedure

The special tests vary for each vehicle, year, and module (Engine, Transmission, ABS, etc.). This section provides basic steps for the special tests.

NOTE: *The screens shown in this chapter are examples for the ABS module. Actual screens vary by vehicle and module.*

To perform special tests on a vehicle, follow these steps:

1. Perform the steps in **Test Startup and Vehicle Connection** on page 14 to enter the vehicle information and display the Diagnostic Menu screen.
2. From the Diagnostic Menu screen, select **Special Tests**. This displays the Special Tests menu screen (shown below).

   NOTE: *If an identification screen appears, review the screen and press the* ***ENTER*** *key to display the Special Tests menu screen.*

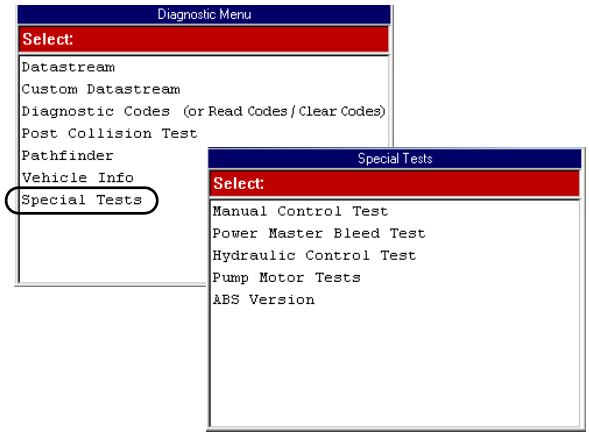


Figure 13.1: Diagnostic Menu Screen and Special Tests Screen

3. **Select the test you want to perform** and press the **ENTER** key.
4. A group selection screen, test selection screen, several step-by-step instruction screens, or bi-directional control screen may appear. **Read the screens and follow all instructions**. If necessary, use the **function keys** to perform commands or answer any questions. Use the **ENTER** key as instructed. (See ***Special Test Screen Examples*** on page 64.)
5. When finished, use the **EXIT** key to return to previous screens.

Special Test Screen Examples

There are two basic types of special test screens: instructional and bi-directional control.

Instructional Screen Example

Instructional screens contain step-by-step instructions for performing a special test. You simply follow the instructions provided on each screen.

Figure 13.2: Instructional Screen Example

Bi-Directional Control Screen Examples

The bi-directional control screens vary in appearance, but they all allow you to manually control the vehicle's relays, solenoids, lamps, and other components.

Basic Single Component Control Screen

The following screen is the basic manual control screen for a single component. You press the Start function key to begin and then use the On and Off function keys to control the component.

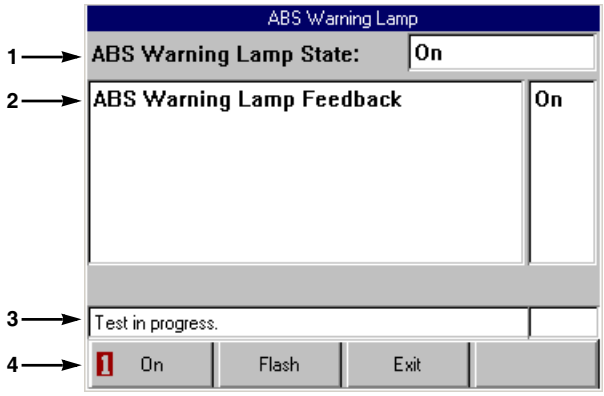


Figure 13.3: Single Component Control Screen Example

Item 1 This area displays the command you have issued through the scan tool (On, Off).

Item 2 This area displays the state of the component being read by the ECU. The bottom of this area may also contain special test instructions.

Item 3 The status line displays the current status of the test.

Item 4 The function keys let you manually control the component as necessary. Compare what is commanded by the scan tool to the state of the component being read by the ECU to the actual physical state of the component.

Basic Multiple Component Control Screen

The following screen is the basic manual control screen for multiple components. This screen allows control of more than one component and has a More function key menu for performing additional functions. You select a component and then press the Start function key to begin. You then use the On and Off function keys to control the selected component.

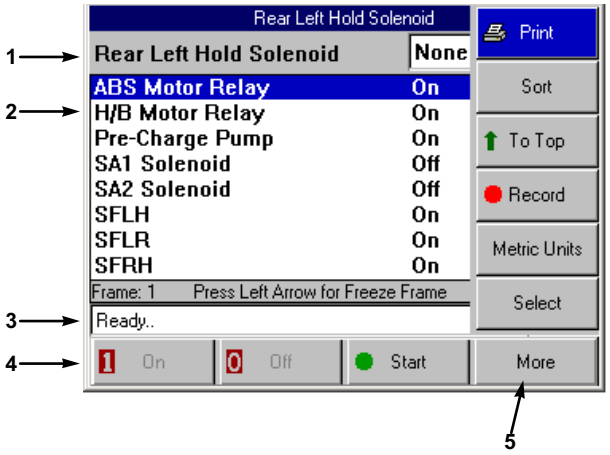


Figure 13.4: Multiple Component Control Screen Example

Item 1 This area displays the command you have issued through the scan tool (On, Off).

Item 2 This area displays the list of components you can control along with the state of each component being read by the ECU.

Item 3 The status line displays the current status of the test.

Item 4 The function keys let you manually control the component as necessary. Compare what is commanded by the scan tool to the state of the component being read by the ECU to the actual physical state of the component.

Item 5 The More menu contains basic Datastream functions. For details, refer to **Datastream Functions** on page 22.

Solenoid, Relay Controls Screen

The following screen is the basic manual control screen for a solenoid and enable relay. You press the Start function key to begin (when you press Start, the key name changes to Exit). You then use the Solenoid and Relay function keys to control the components.

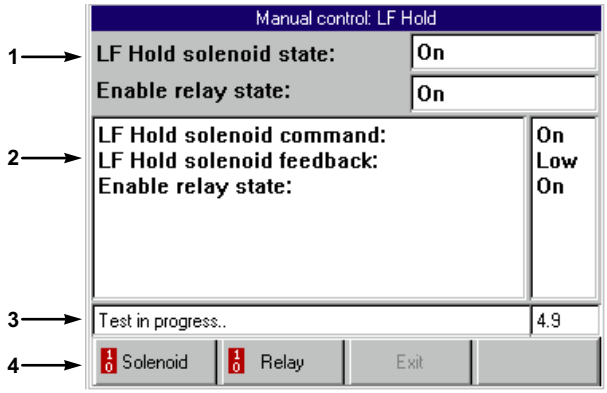


Figure 13.5: Solenoid, Relay Controls Screen Example

Item 1 This area displays the commands you have issued through the scan tool (On, Off).

Item 2 This area displays the states of the components being read by the ECU. The bottom of this area may also contain special test instructions.

Item 3 The status line displays the current status of the test.

Item 4 The function keys let you manually control the component as necessary. Compare what is commanded by the scan tool to the state of the component being read by the ECU to the actual physical state of the component.

Automatic Test Screen

The following screen is an example of an automatic test screen.You press the Start function key to begin the automatic test.

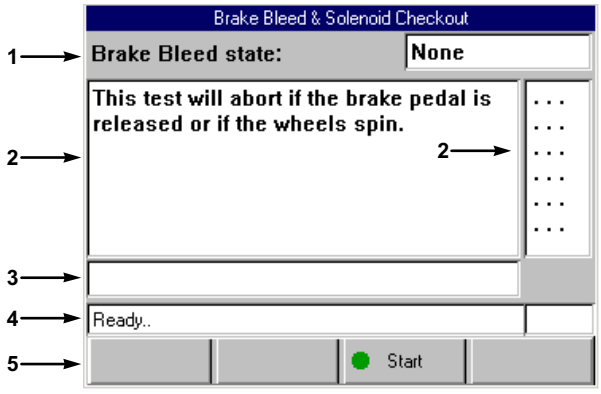


Figure 13.6: Automatic Test Screen Example

Item 1 This area displays the state of the test commands being issued by the scan tool (On, Off).

Item 2 This area displays each component. As the test runs, the brackets around the dots indicate the component(s) currently being tested.

> ***NOTE:*** *The bracket on the left side of the dot represents the command and the bracket on the right side represents the feedback. If one of the brackets is missing during the test, it indicates a problem.*

Item 3 This area may display special test instructions.

Item 4 The status line displays the current status of the test.

Item 5 The Start function key starts the test.

Activate/Deactivate Screen

The following screen is an example of a manual control screen with a toggle Activate/Deactivate function key. You use this function key to begin the test.

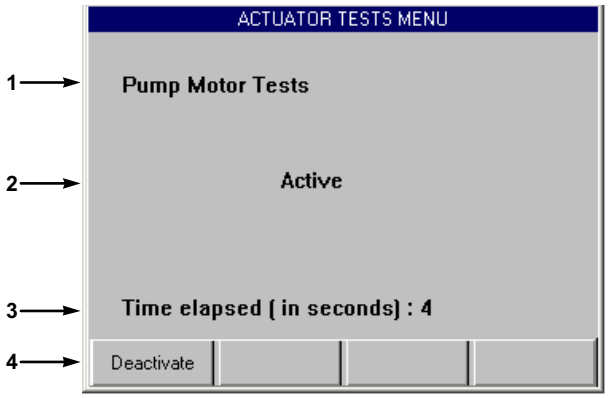


Figure 13.7: Activate/Deactivate Screen Example

Item 1 This area displays the name of the component being tested.

Item 2 This area displays the state of the component.

Item 3 This area shows the time clock for the test.

Item 4 The function keys let you manually control the component as necessary. Compare what is commanded by the scan tool to the state of the component being read by the ECU to the actual physical state of the component.

> ***NOTE:*** *Press the **Activate** function key to turn on the component. This changes the component state to "On" and changes the function key to "Deactivate". Press the **Deactivate** function key to turn off the component.*

14: Playback

The Playback function lets you view data recorded with the Datastream Record function (see page 22) and the DTC-Triggered Recording function (see page 32). It also lets you save and delete recorded files.

1 Make sure the scan tool has power.

NOTE: *The scan tool does not have to be connected to a vehicle.*

2 Press the **On / Off** button to turn the scan tool on; wait for the Application Manager screen to appear.

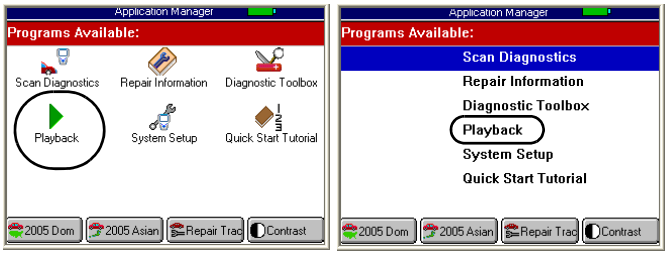


Figure 14.1: Application Manager Screen Examples

3 Select **Playback** and then press the **ENTER** key. This displays the Events to Playback screen.

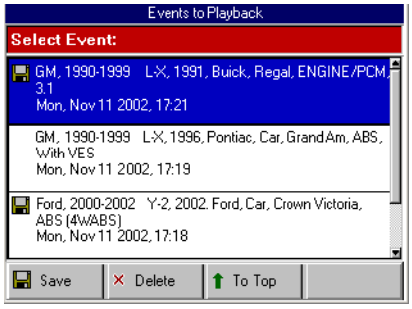


Figure 14.2: Events to Playback Screen

NOTE: *The Events to Playback list holds 25 recordings. When the list is full, old recordings automatically delete as you make new recordings. To prevent a recording from being automatically deleted, highlight the recording and press the **Save** function key. This places a disk icon to the left of the file name and saves the recording until you delete it. (Use the **Delete** function key to delete a selected recording.)*

4 **Select the recorded event to replay** and press the **ENTER** key. (The events are identified by the vehicle description, date, and time of the recording.)

The recorded event displays on either the DTC display screen or the Datastream screen, depending on the type of recording (Fault Codes or Live Data).

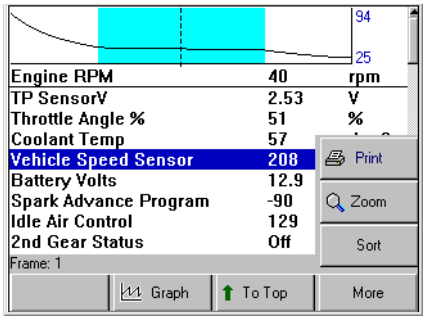


Figure 14.3: Playback Screen

5 If the Datastream screen displays, use the **Left** and **Right Direction** keys to view the data. The Frame number in the status line changes as you move through the recording.

NOTE: *There may be a **DTC** function key you can use to view a list of any DTCs that existed at the time of the recording. You can use the To Top function key to move a selected line to the top of the screen. You can also use other functions of the Datastream screen, such as Graph, Print, Zoom, and Sort. Refer to the steps for these in **Datastream Functions** on page 22.*

6 When you are finished viewing the recording, use the **EXIT** key to return to previous screens.

NOTES:

15: System Setup

The System Setup functions let you adjust default settings and view information about the scan tool.

Basic Procedure

To access the System Setup functions, follow these steps:

1 Make sure the scan tool has power.

2 Press the **On / Off** button to turn the scan tool on; wait for the Application Manager screen to appear.

3 Select **System Setup** and press the **ENTER** key. This displays the System Setup screen.

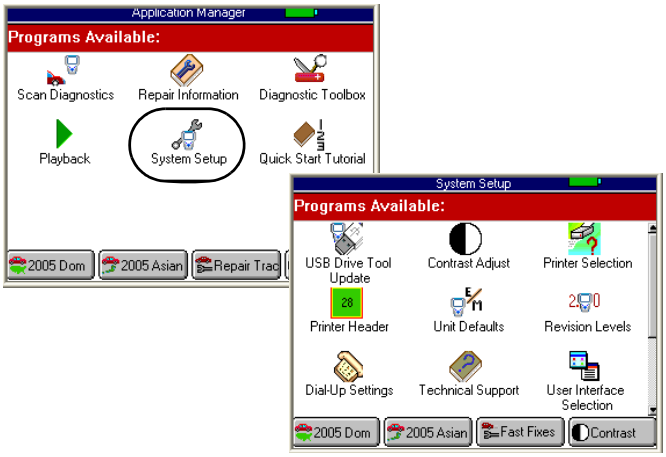


Figure 15.1: Application Manager and System Setup Screens

4 **Select the item** to adjust and press the **ENTER** key.

5 Refer to the following sections:

- **USB Drive Tool Update** (next column)
- **Contrast Adjust** on page 70
- **Printer Selection** on page 71
- **Printer Header** on page 71
- **Unit Defaults** on page 72
- **Revision Levels** on page 72
- **Dial-Up Settings** on page 72
- **Technical Support** on page 73
- **User Interface Selection** on page 73
- **Color Scheme Selection** on page 73
- **Function Key Assignments** on page 73
- **Hardware Tests** on page 74
- **Language** on page 74
- **Disk Usage** on page 74
- **File System Check** on page 74

USB Drive Tool Update

The USB Drive Tool Update function lets you update the scan tool software with files on a USB drive.

NOTE: *For complete tool update instructions, refer to NGIS Software Application Installation and Updates (OTC p/n 534168).*

1 Turn the scan tool off and insert the USB drive entirely into the USB port.

2 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

3 Select **USB Drive Tool Update** and press the **ENTER** key. The tool starts checking the portable USB drive and displays a *Please Wait* message screen.

4 Wait while the tool checks for update files on the portable USB drive and for the next *USB Drive Tool Update* screen to appear.

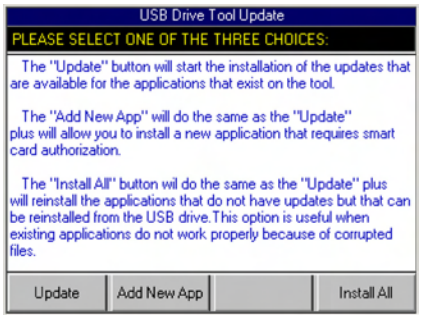


Figure 15.2: USB Drive tool Update Screen

5 Read the instructions on the screen.

6 IF INSTALLING A NEW APPLICATION, insert the Smart Card into the Smart Card slot.

7 Do one of the following:

- Press the **Update** function key to update only the tool applications that require updating.
- Press the **Add New App** function key to install a new application and to also update the tool applications that require updating.
- Press the **Install All** function key install a new application and to also update ALL of the applications on the tool, whether or not they require updating (this is a complete reinstall of all applications on the tool; use it to repair corrupt applications).

8 Wait while the tool checks for updates on the portable USB drive and for the *Instructions* screen to appear.

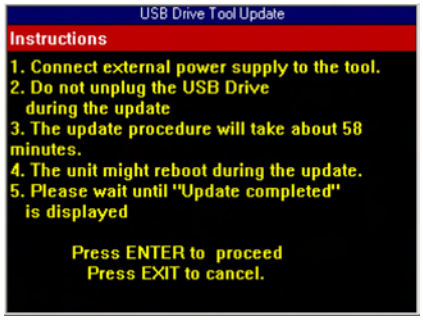


Figure 15.3: Instructions Screen

9 Read the instructions on the screen.

10 Press the **ENTER** key. The tool checks the external power source, starts the update, and then displays an update progress screen.

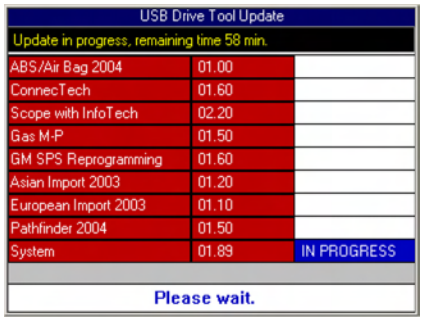


Figure 15.4: Update Progress Screen

11 Notice the remaining time status bar at the top of the screen. This time changes after the update of each application.

12 Notice that when a **System** update completes, the scan tool reboots, checks the file systems, and then displays the update progress screen again.

13 Wait for all updates to complete and for the *USB Drive Tool Update Completed* message to appear.

Figure 15.5: Tool Update Complete Message Screen

14 Remove the portable USB drive from the tool.

15 Remove the Smart Card from the tool (if used).

16 Press the **ENTER** key to complete the update.

Contrast Adjust

The Contrast Adjust function lets you adjust the contrast of the LCD screen.

NOTE: *Temperature or lighting may affect the brightness of the scan tool screen. If necessary, use the Contrast Adjust function to adjust the screen for working conditions.*

1 Follow the steps in **Basic Procedure** to display the System Setup screen (see *Figure 15.1*).

2 Select **Contrast Adjust** and press the **ENTER** key.

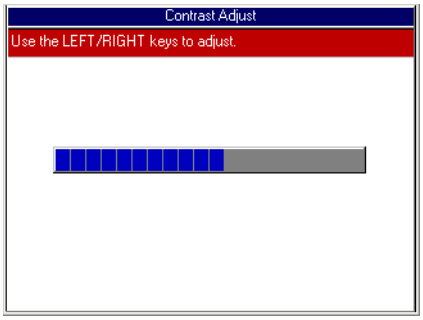


Figure 15.6: Contrast Adjust Screen

3 Use the **Left** and **Right Direction** keys to adjust the contrast.

4 Use the **EXIT** key to return to previous screens.

Printer Selection

The Printer Selection function lets you select a printer for printing from the scan tool.

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **Printer Selection** and press the **ENTER** key.

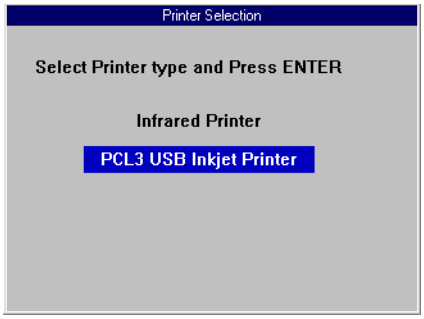


Figure 15.7: Printer Selection Screen

3 **Select a printer** and press the **ENTER** key.

IMPORTANT PRINTING NOTES:

- The USB Inkjet printer is recommended.
- When printing, do not press any keys on the tool until the printing stops.
- If using an infrared printer, make sure the distance between the tester and printer is less than 3 feet; point the top of the tester at the printer's infrared LED until the printing stops.

Printer Header

The Print Header function lets you set up a heading for reports that you print from the scan tool.

NOTE: *You can turn the Print Header function on and off with the Unit Defaults settings. Refer to* ***Unit Defaults*** *on page 72.*

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **Printer Header** and press the **ENTER** key.

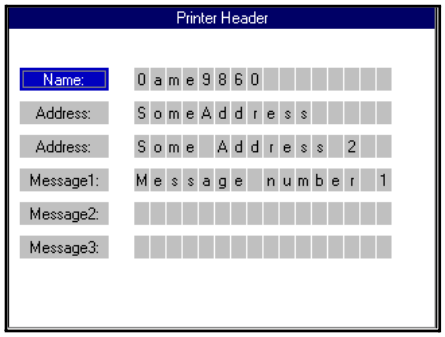


Figure 15.8: Printer Header Screen

3 Use the **Up** and **Down Direction** keys to select Name, Address, or Message.

4 Press the **Right Direction** key once to move to the first edit box.

5 Use the **Up** and **Down Direction** keys to select a character for the box.

NOTE: *To remove a character and leave a box blank, select the character that is blank (it is between 0 and A).*

6 Press the **Right Direction** key to select the next box.

NOTE: *Pressing the Left Direction key selects the previous box.*

7 Repeat steps 5 and 6 until the line is entered as you want it.

8 Repeatedly press either the **Left** or **Right Direction** key to return to the Name, Address, or Message box.

9 Repeat steps 3 through 8 until all the information is entered.

10 Use the **EXIT** key to return to previous screens.

Unit Defaults

The Unit Defaults function lets you set the date, time, units-of-measure, and automatic shut down time. It also lets you turn the audible beep and print header functions on or off.

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **Unit Defaults** and press the **ENTER** key.

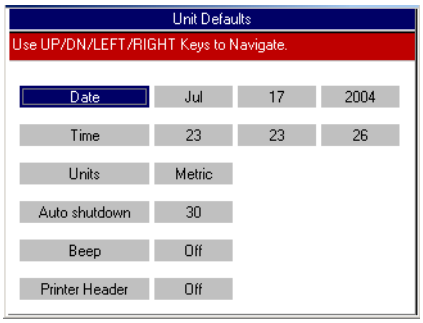


Figure 15.9: Unit Defaults Screen

3 Use the **Up** and **Down Direction** keys to select the item to set from the far left column:

- **Date —** sets the date in the scan tool as month, date, and year.
- **Time —** sets the time in the scan tool as hours, minutes, and seconds (24 hour clock).
- **Units —** sets the units-of-measure as English or Metric.
- **Auto Shutdown —** sets the amount of time the scan tool stays on before shutting off automatically (only when using internal battery power). This is the amount of time since the last key press. The setting can be made for between 5 and 60 minutes, in 5 minute increments.
- **Beep —** turns the audible beep on or off.
- **Print Header—** turns the print header function on or off. Refer to **Printer Header** on page 71.

4 Press the **Right Direction** key once to move to the edit box.

5 Use the **Up** or **Down Direction** key to select an option for the box.

6 For Date and Time, repeat steps 4 and 5 to enter the entire date or time.

7 Use the **Left Direction** key to go to the far left column.

8 Repeat steps 3 through 7 until all the settings are made.

9 Use the **EXIT** key to return to previous screens.

Revision Levels

The Revision Levels function displays software version numbers (for use when calling technical support).

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **Revision Levels** and press the **ENTER** key.

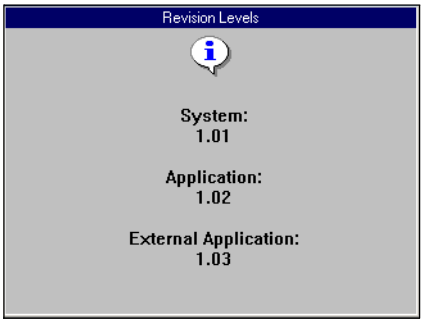


Figure 15.10: Revision Levels Screen

3 View the information.

4 Use the **EXIT** key to return to previous screens.

Dial-Up Settings

The Dial-Up Settings function lets you set up IP addresses for communications (wired or wireless) between the scan tool and a PC or external device.

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **Dial-Up Settings** and press the **ENTER** key.

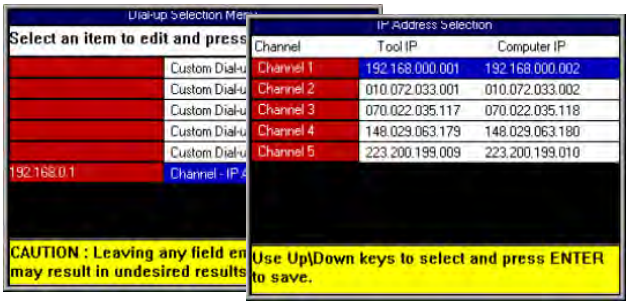


Figure 15.11: Dial-Up Settings Screens

3 On each screen that appears, select a dial up number or IP Address to edit and press the **ENTER** key.

NOTE: *Select an IP Address that is not in use by your network or another scan tool. If you are using multiple scan tools, use a different IP Address for each tool.*

4 When finished, use the **EXIT** key to return to previous screens.

Technical Support

The Technical Support function displays technical support information.

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **Technical Support** and press the **ENTER** key.

Figure 15.12: Technical Support Screen

3 View the information.

4 Use the **EXIT** key to return to previous screens.

User Interface Selection

The User Interface Selection function lets you set the scan tool main screens to display options as either icons or menus.

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **User Interface Selection** and press the **ENTER** key.

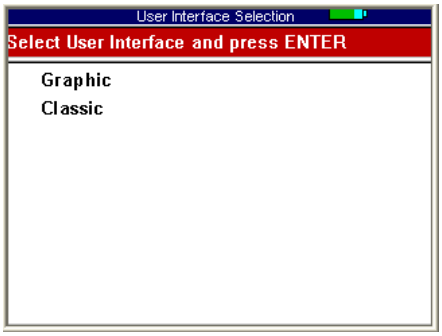


Figure 15.13: Interface Selection Screen

3 Select an **option** and press the **ENTER** key:

- Select **Graphic** to have the screens display options as icons.
- Select **Classic** to have the screens display options as menus.

4 Follow the instructions that appear on the screens. The scan tool will have to be turned off and back on.

Color Scheme Selection

The Color Scheme Selection function lets you set the color of the background and text that appears on the scan tool screens.

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **Color Scheme Selection** and press the **ENTER** key.

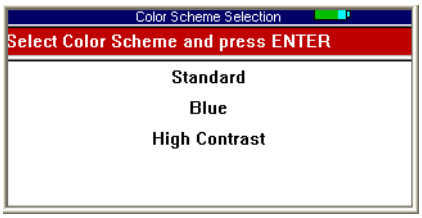


Figure 15.14: Color Scheme Selection Screen

3 **Select a color scheme** and press the **ENTER** key.

4 Follow the instructions that appear on the screens. The scan tool may have to be turned off and back on.

Function Key Assignments

The Function Key Assignments function lets you assign specific frequently-used applications to the function keys at the bottom of the Application Manager screen.

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **Function Key Assignments** and press the **ENTER** key.

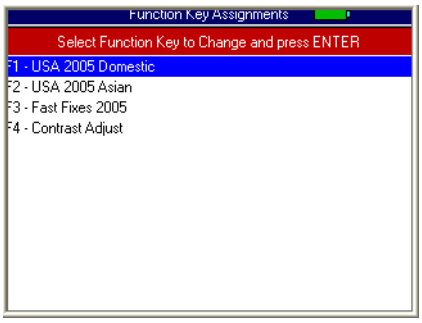


Figure 15.15: Function Key Assignments Screen

3 **Select a function key to change (1, 2, 3, 4)** and press the **ENTER** key. This displays a list of applications.

4 Select the **application** to assign to the selected function key and press the **ENTER** key.

5 Follow the instructions that appear on the screens. The scan tool may have to be turned off and back on.

Hardware Tests

The Hardware Tests function lets you test the LCD screen, keypad keys, and beeper, and lets you view the time clock and the serial number for the scan tool.

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **Hardware Tests** and press the **ENTER** key.

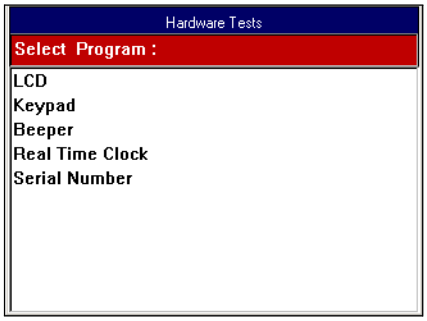


Figure 15.16: Hardware Tests Screen

3 **Select an option** and press the **ENTER** key.

4 Follow the instructions on the screen that appears.

NOTE: *If you select Keypad, the message "To test the Backlight key, just observe the backlight itself" appears. Press the ENTER key.*

5 Use the **EXIT** key to return to previous screens.

Language

The Language function lets you set the default language for the scan tool software.

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **Language** and press the **ENTER** key.

Figure 15.17: Language Selection Screen

3 Use the **Up** and **Down Directions** keys to select the language.

4 Press the **Select** function key.

5 Use the **EXIT** key to return to previous screens.

Disk Usage

The Disk Usage function lets you view details about the scan tool memory size and usage.

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **Disk Usage** and press the **ENTER** key.

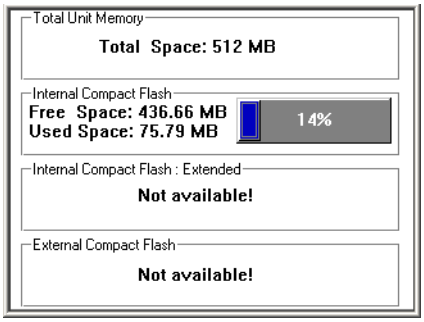


Figure 15.18: Disk Usage Screen

3 View the disk usage information.

4 Use the **EXIT** key to return to previous screens.

File System Check

The File System Check function lets you test the file system on the memory card(s).

1 Follow the steps in **Basic Procedure** on page 69 to display the System Setup screen (see *Figure 15.1*).

2 Select **File System Check** and press the **ENTER** key.

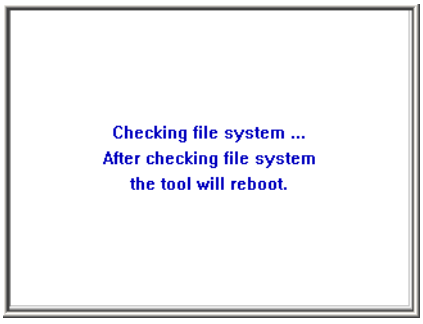


Figure 15.19: File System Check Screen

3 Wait for the scan tool to turn off and on automatically as it does a self-check.

16: Printing

Screen displays can be printed to a infrared-capable portable printer or a USB inkjet printer.

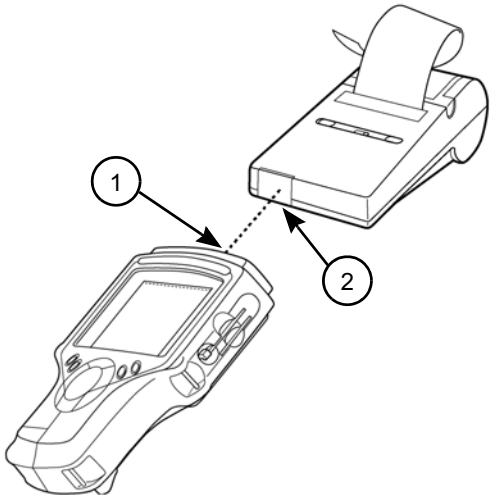
Infrared Printer Operation

You can print diagnostic trouble codes, sensor data, and report summary data from the scan tool to a Hewlett Packard infrared printer (OTC P/N 3157).

To print data to an infrared printer, follow these steps:

1 Turn on the battery-powered infrared printer.

2 Point the scan tool infrared port at the printer's infrared port and press the **Print** function key on the scan tool.



Item 1 Printer Infrared Port

Item 2 Tool Infrared Port

Figure 16.1: Infrared Port Printing

IMPORTANT: The tool infrared port must remain pointed at the printer infrared port until the entire print operation is complete.

USB Inkjet Printer

You can print text and graphics from the scan tool to to ink-jet printers with built-in PCL 3 (most Hewlett-Packard Deskjet printers).

To print graphics and text to a USB ink-jet printer, follow these steps:

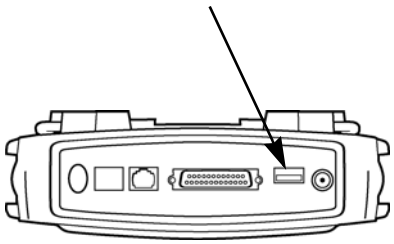


Figure 16.2: Scan Tool USB Port

1 Connect a USB cable to the USB port on the tool and to the USB printer.

2 From the scan tool **System Setup** screen, select **Printer Selection** then **USB InkJet Printer**. Select your printer from the list of supported printers and then press the **EXIT** key. (See **Printer Selection** on page 71.)

3 Press the **Print** function key to print a screen or recorded files.

IMPORTANT: Do not press any keys until the printer finishes printing.

NOTES:

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Replacement and optional parts can be ordered directly from your SPX authorized tool supplier.
Your order should include the following information:

- quantity
- part number
- item description

Technical Service

If you have any questions on the operation of the product, please call (800) 533-6127.

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- company name
- contact name
- telephone number
- description of the problem
- proof-of-purchase for warranty repairs
- preferred method of payment for non-warranty repairs

For non-warranty repairs, payment can be made with Visa, Master Card, or with approved credit terms.
To receive a credit application, please fax your request to the Credit Department at 800-962-8734.

Send the unit to:
SPX Service Solutions
RGA: Repair Dept.
2300 Park Drive
PO Box 994
Owatonna, MN 55060-0994

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