Delaware

Vehicle Inspection Program

Lane Operator's Manual

ESP-MAN1082

Edition 4.1

June 2005

Environmental Systems Products

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Chapter 1 SystemOne Features

The SystemOne® Emissions Inspection Analyzer is an advanced computer-based system designed to perform an official emissions inspection test.

NOTE: For a complete list of components and part numbers, refer to the **Delaware Project System Tree, ESP11100**

POSITION 1 UNIT

- Base Analyzer
- Personal computer system including a Windows 2000 operating system with not less than a 1.8GHz Celeron processor, 80 GB HD, and a 128K Cache; integrated sound and video; a 48X CD ROM drive, a 1.44MB FD drive
- 105-key keyboard
- 3.5" floppy disk drive
- 2-button mouse
- 17-inch viewable image color monitor
- Laser printer with two paper trays
- T3-gas (HC, CO, CO_2) Exhaust Gas Sample System
- 2-D Bar Code Scanner
- Existing customer monitor
- Vetronix OBD II unit
- Serial RPM contact and non-contact pickups
- RF 8-button, wireless remote control

POSITION 2 UNIT

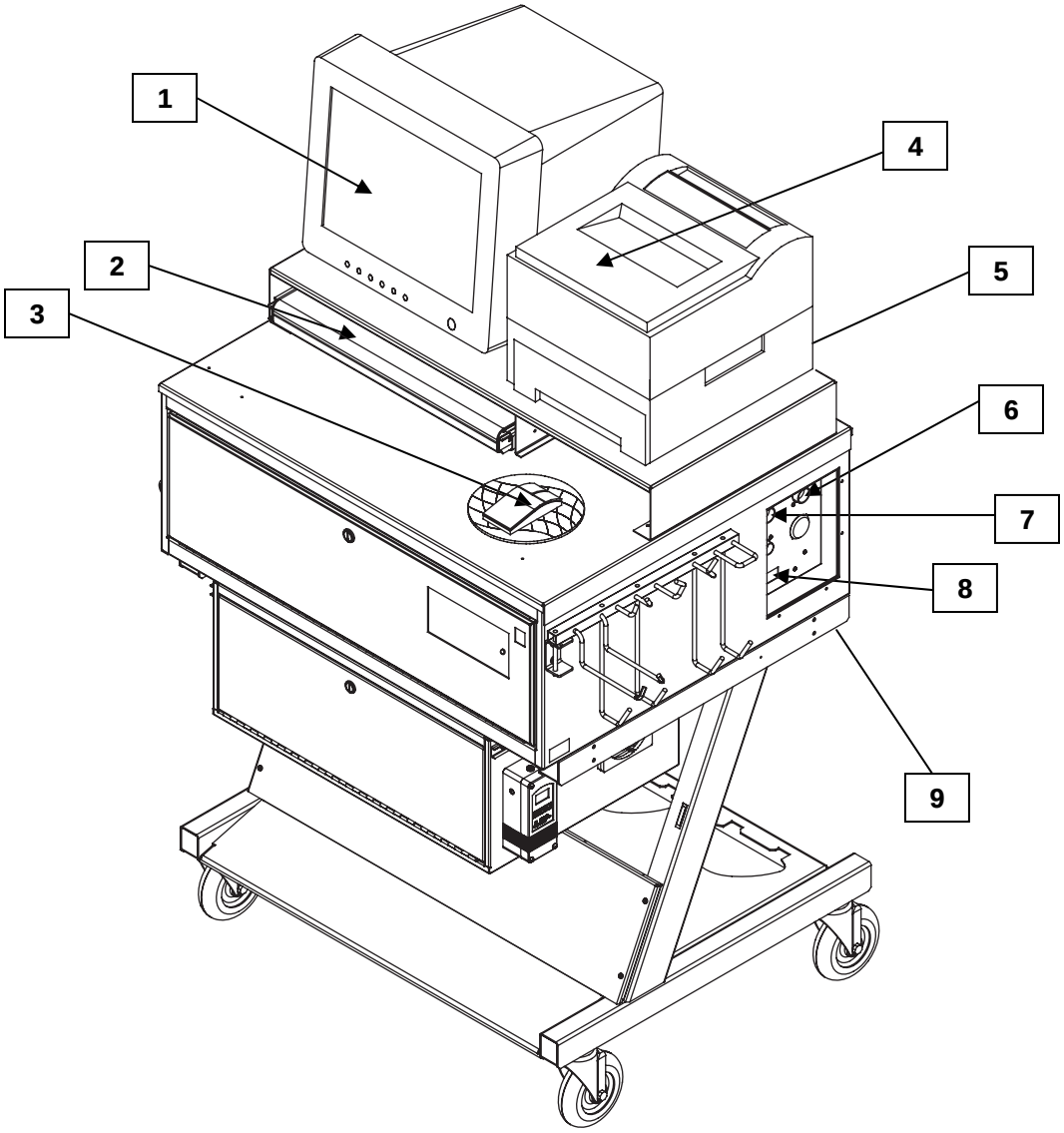
- Base Analyzer
- Personal Computer system including a Windows 2000 operating system with not less than a 1.8GHz Celeron processor, 80 GB HD, and a 128K Cache; integrated sound and video; 48X CD ROM drive; a 1.44MB FD drive
- 105-key keyboard
- 3.5" floppy disk drive
- Mouse
- 17-inch viewable image color monitor
- Laser printer
- Fuel Cap/Fuel Tank Tester

TECHNICAL SPECIFICATIONS

- 3-gas emissions analyzer
- HC, CO, CO2, O2, RPM, speed and load readings displayed simultaneously
- Provides automatic zero and span, warm-up, lockout and low flow indicators
- Self-calibrates by initiating a command on the PC
- Warm-up time: less than 30 minutes from 40º F to 110º F
- Includes calibration gas kit

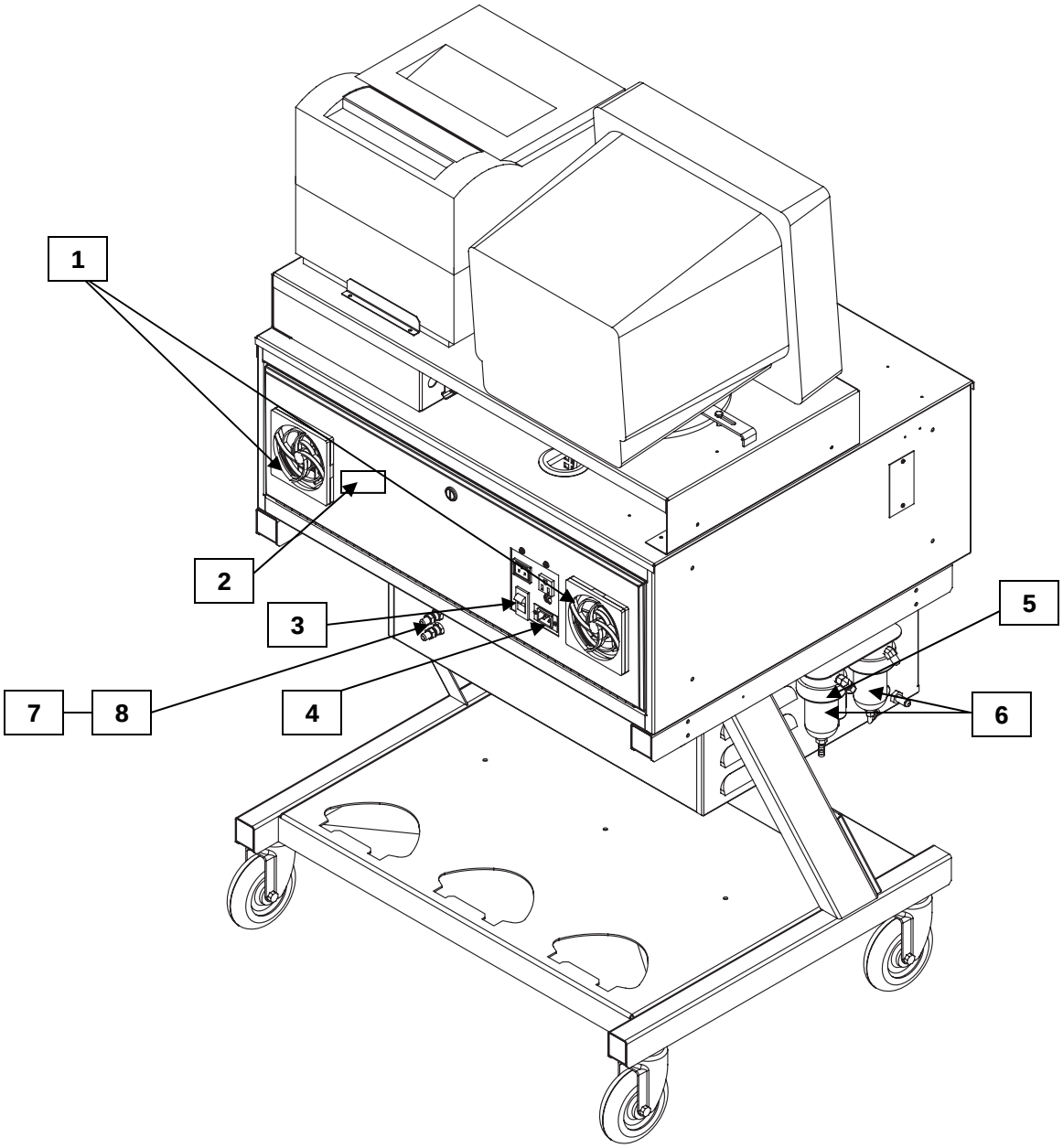
UNIT ILLUSTRATIONS

Front of Position 1 Unit



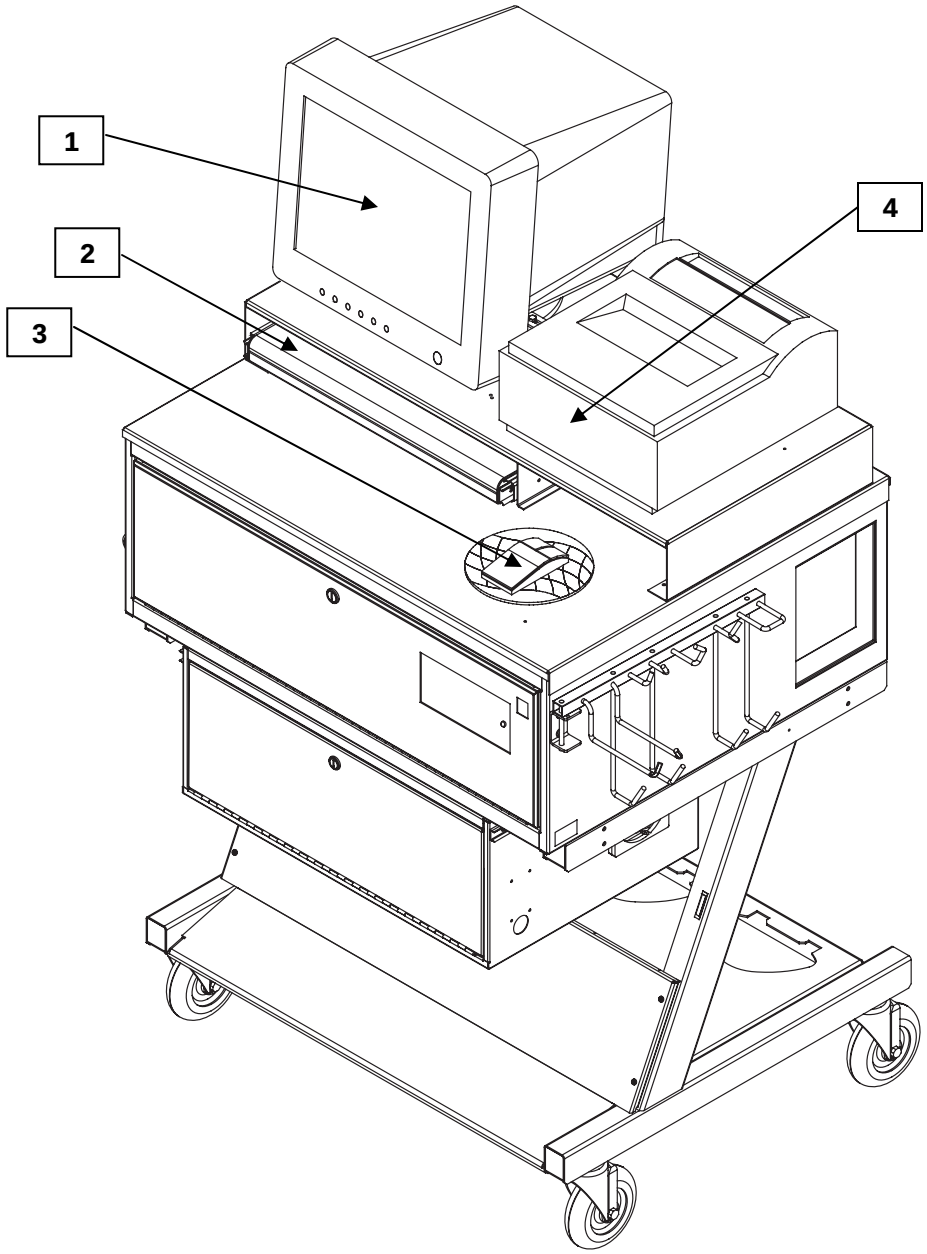
1) Monitor
2) Keyboard
3) Mouse and Pad
4) Printer
5) Additional Paper Tray
6) RPM Probe Connector
7) Non-Contact RPM Probe Connector
8) OBD II Cable Connector
9) Bar Code Scanner Connector

Back of Position 1 Unit



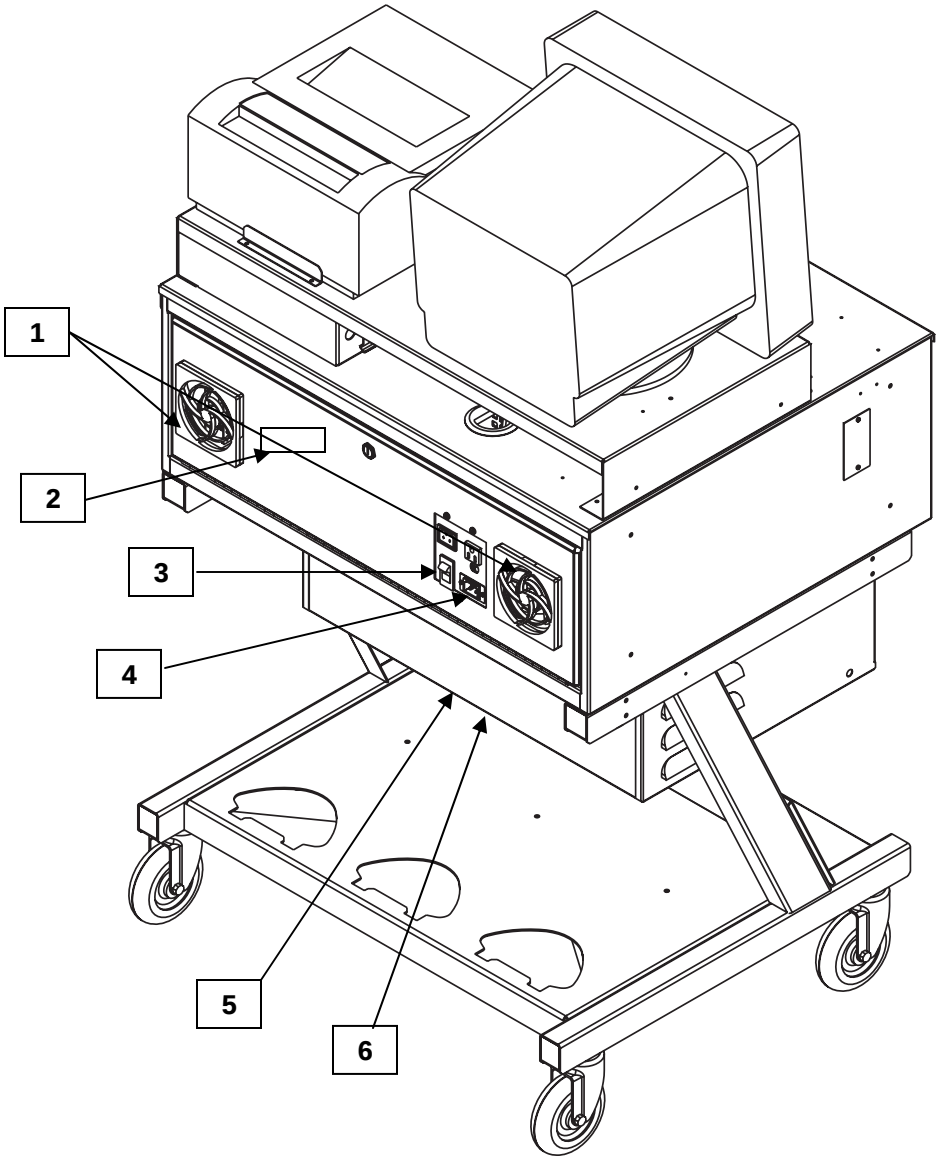
1) Fan Filters (2)
2) Serial Number
3) Power Switch
4) AC Power Cord Connection
5) Exhaust Hose Connector
6) Filter Bowls
7) BAR-90 Mid Cal Gas Connector
8) BAR-90 Low Cal Gas Connector

Front of Position 2 Unit



1) Monitor
2) Keyboard
3) Mouse and Pad
4) Printer

Back of Position 2 Unit



1) Fan Filters (2)
2) Serial Number
3) Power Switch
4) AC Power Cord Connector
5) Fuel Cap Pressure Hose Connector
6) Fuel Tank Pressure Hose Connector

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Chapter 2 General Safety

OVERVIEW

This chapter describes general equipment safety procedures. Obey the safety procedures to avoid injury and damage to the equipment.

NOTE: Make sure there is adequate ventilation to avoid toxic gas buildup. To check levels, install a carbon monoxide and a NO_x monitor in the testing area. For optimal safety and testing accuracy, please read this manual before using the SystemOne® Analyzer.

PERSONAL SAFETY

Act Responsibly

- Read the instructions in this manual before attempting to operate, maintain, or service any of the equipment in the system.
- **DO NOT** attempt to get in or out of a vehicle while equipment affecting vehicle stability is being operated.
- At all times, stay alert and be aware of moving parts such as turning rollers or traveling lifts.

Protect Eyes

- Always wear approved safety glasses when near a vehicle being tested or machinery being serviced. Moving parts can throw off debris that can cause eye injury.

Protect Hearing

- Always wear approved ear protection to avoid hearing loss from vehicle and equipment noise.

Watch Your Hands and Feet

- Never put hands or feet inside of the equipment when the shop air supply and/or power are connected. Equipment that is connected to air and/or power can sever, puncture, or crush your limbs.

EQUIPMENT SAFETY

Vent Engine Exhaust

- **DO NOT** operate the vehicle without proper ventilation. High concentrations of engine exhaust can be deadly.

Monitor Carbon Monoxide

- Install a carbon monoxide monitor in the work area.

Markings and Guard Rails

- Provide floor markings and protective guardrails for everyone's protection.

Equipment Clearance

- Always make sure there is adequate clearance to the front, rear, and sides of the test equipment.

Electrical Hazards

- Turn off the electrical disconnect before performing any maintenance activity.
- The analyzer must be plugged into a properly grounded outlet.
- **DO NOT** cut off the grounding plug on an AC power cord.
- **DO NOT** use a 2-prong or 3-prong adapter. If an extension cord is needed, use a 3-wire type with the grounding circuit in good condition.
- Avoid wet floors when plugging equipment into an electrical outlet.
- **DO NOT** use fuses of a higher ampere rating than specified.

Air Pressure

- Make sure there is no air pressure in the lines when working near a lift, brakes, or air bags.

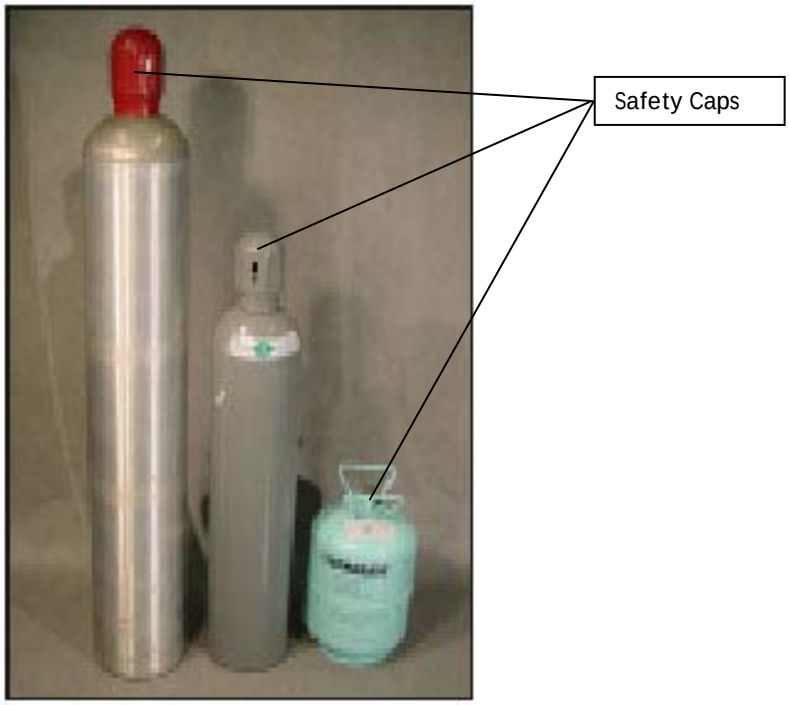
Check Tightness

- Make sure all bolts and couplings are tight and secure.

High Pressure Compressed Gas Cylinders

- Cylinder pressure rises with temperature. Keep cylinders below 52 degrees C (125 degrees F).
- Keep the cylinder's main valve closed when not in use. Always check that the main valve is closed before removing any outlet plugs or caps.
- **DO NOT** tamper with the safety device on the cylinder main valve assembly.
- Use only the pressure regulator supplied with the equipment.
- When attaching the regulator, **DO NOT** force connections.
- Turn the cylinder on and off to check for leaks. If a leak is detected from any pressurized cylinder or main valve assembly, **DO NOT** attempt repairs. Notify supervision or the station manager immediately.
- **DO NOT** allow unauthorized persons to use or tamper with pressurized cylinders.
- **DO NOT** drop cylinders or permit them to strike each other violently.
- When moving or handling individual cylinders, always position them so they will **NOT** be accidentally knocked over.

- Never store cylinders with flammable materials near sources of ignition.
- Cylinders must be chained to the wall or otherwise restrained except when installed or being moved.
- When storing gas cylinders in a vehicle, secure them to the wall or floor using a chain and lock or a stretchable rope hook to avoid falling or shifting.
- Make sure that the main cylinder valve is closed when a cylinder is **NOT** in use.
- Use the correct safety cap, with the regulator attached, when transporting high-pressure cylinders.
- Never move or transport a cylinder unless the safety cap is firmly in place.
- Never lift a pressurized cylinder by the safety valve cap.



WARNING: Use caution when handling gas cylinders. Gases released from a pressurized cylinder, even nontoxic gases, can cause unconsciousness or death, if they displace the air in an enclosed area, such as a closed room or vehicle.

- **DO NOT** dispose of any residual gases in any pressurized cylinder with out checking the pressure with a regulator
- **DO NOT** remove or alter labels, decals, and so on, that identify cylinder or contents

Chapter 3 Daily Start Up

OVERVIEW

Before operating the SystemOne® analyzer for the first time, have your electrical outlet checked by a qualified technician. With the analyzer plugged in, minimum allowable voltage is 115 volts AC. The ground circuit should carry no more than 8 volts AC and it is recommended that the outlet be dedicated to the analyzer. An 8 amp circuit breaker is located inside the main power switch to provide overload protection. A single power switch controls the analyzer and its computer system. This switch is located on the back of the unit.

START UP PROCESS

Logging on to the System

In order to perform vehicle tests, log on to the lane at Position 1 and Position 2.

1. After you start up the system, the **Log on to Windows** window opens. Enter your **User name** and **Password** in the corresponding fields and click **OK**. **Windows** desktop displays.
2. The **Vehicle Inspection and Maintenance Program** window opens. Enter the **Inspector ID** and **Password** in the appropriate fields and click **OK**. The **Start Up Messages** window opens.

NOTE: After a successful startup, perform required calibrations and QA checks (see **Chapter 7**, **Maintenance and Troubleshooting**). The Inspector must logon before having access to the test vehicle process.

Start Up Messages

When starting up the analyzer at Position 1, Position 2 or at the Station Manager PC for the first time, the Startup Messages window opens.
Some of the messages may include:

- Checking for new software update
- The software is up-to-date
- Date and time successfully synchronized
- Current date is:
- Current time is:
- Employee List is up-to-date
- Repair ID List is up-to-date
- Configuration Test Record is up-to-date
- Special Configuration Test Record is up-to-date
- OBD II Exclusions Record is up-to-date
- Gas Cap Adapter List is up-to-date

Click **OK** to proceed once the button becomes functional (turns from red to black), or wait 15 seconds and the **Main Menu** window opens.

Main Menu

The Main Menu is the central component for the vehicle inspection and provides access to all SystemOne® functions.

NOTE: You can also access the Vehicle Inspection and Maintenance Program from the Main Menu: From the Main Menu, click Standby. The Vehicle Inspection and Maintenance Program window opens. Follow the instructions above.

The Main Menu options are:

- Standby
- Test Vehicle
- Daily
- Utilities
- Reissue
- Maintenance
- Quality Assurance

NOTE: Some Main Menu items lead to a submenu from which additional choices are available. Highlighted menu items are fully functional. Grayed-out items are unavailable**.**

1. From the **Main Menu**, click **Daily**.
2. The **Daily Menu** opens. Click **Startup**.
3. The Startup process prepares the system for normal daily operations. Startup performs a variety of necessary tasks including the following:
   - Set up paths
   - Gets station, lane and position information
   - Checks for communications with the DMV Host Server and with the Station Manager PC
   - Confirms date and time
   - Purges files older than 90 days
   - Checks for updates

   When the process completes, click Previous to return to the Main Menu window.

Analyzer Warm-up Time

After you turn the power on, a warm-up period of up to 30 minutes may be required before the gas analyzer is ready for use. You will be locked out of the emissions inspection functions until the gas analyzer is warmed up.

Navigating through the Windows

You can use both standard Windows® keyboard commands and a mouse to navigate through items on the vehicle test system windows. Some of the common Windows navigation keys include the up arrow and down arrow keys, tab, shift+tab, and enter.

POSITIONING AND USING THE PROBES

Exhaust Probes

For most vehicles you can use the standard exhaust probe that is attached to the sample system analyzer.

Insert the exhaust probe in the tailpipe according to the instructions on the monitor, a minimum depth of 16 inches.

If the vehicle's exhaust system prevents insertion to the minimum depth of 16 inches, a tailpipe extension should be used.

If the vehicle has two exhaust pipes, attach the second flexible probe and hose to the quick disconnect on the main exhaust hose Y. Insert one flexible probe into each exhaust pipe.

GUIDELINES FOR THE VEHICLE TEST SYSTEM

- ESP recommends that the power to the sample system analyzer remain on at all times.
- For best economy and efficiency, turn off the monitor and printer each night.

SHUTTING DOWN THE LANE

The shutdown process will close the lane.

To shut down on Position 1:

3. From the **Main Menu**, click **Daily**.
4. The **Daily Menu** opens, click **Shutdown**.
5. The **Current Record Transmission Status** window opens and:
    - The **Shut Down Check** dialog box opens and displays the following message: **Delete inactive records from ACTIVETESTS table?** Click **Yes**.
    - Displays records transmitted and records not ready to transmit.
6. From the **Current Record Transmission Status** window, click **Continue**.

   NOTE: Click **Cancel** to return to the **Main Menu**.
7. The **Shut Down** window opens. The **System Exit** dialog box opens and displays the following message: **You have chosen to close the application, shut down Windows, and power off the computer**. Click **Continue**.
8. The shutdown process turns off the computer.

To shut down on Position 2:

1. From the **Main Menu**, click **Daily**.
2. The **System Exit** dialog box opens and displays the following message: **You have chosen to close the application, shut down Windows, and power off the computer**. Click **Continue**.
3. The shutdown process turns off the computer.

NOTE: Shut down Position 2 first, then Position 1.

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Chapter 4 Inspecting a Vehicle – Position 1

OVERVIEW

At Position 1, you will enter Vehicle Criteria into the system; and perform some or all of the following tests: Emissions, Safety Inspection, Emission Control System (ECS); and print Form 213A and Form MV213. Upon completion of the Position 1 vehicle inspection, data from Position 1 will automatically be transferred to Position 2 to complete the testing process.

NOTE: During the inspection process, if a test needs to be aborted for any reason, click **Abort**.

NOTE: If necessary, a test can also be bypassed. To bypass a test, click **Bypass**. The **Are you sure you want to bypass the test now?** window opens. Click **Yes** and proceed to the next test. All tests that are bypassed are considered to have FAILED the subtest.

PREPARING FOR A TEST

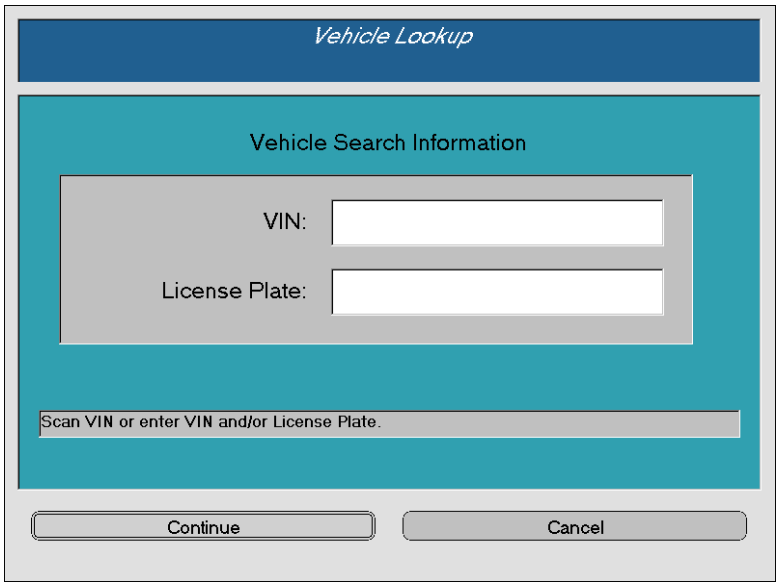
Before you perform a test, maintenance or calibrations may be required on some equipment. Refer to **Chapter 7**, **Maintenance and Troubleshooting**.

Entering Vehicle Criteria

During the data entry function, you will enter, verify and modify vehicle information. It is the vehicle information that determines which test(s) will be performed.

1. From the **Main Menu**, click **Test Vehicle** and clear any lockouts in order to proceed with the vehicle inspection (see **Chapter 7**, **Maintenance and Troubleshooting**).
2. The **Vehicle Lookup** window opens. Enter the vehicle search information: scan the VIN (Vehicle Identification Number) with the bar code scanner or manually enter the VIN and/or the vehicle license plate. Click **Continue** to proceed (or click **Cancel** to return to the **Main Menu**). Once the vehicle search information has been entered, wait while the system searches for the vehicle data.

   NOTE: The VIN for vehicles manufactured in or after 1981 are usually 17 characters long.



After entering the VIN, a prompt will notify you if the vehicle has PASSED inspection within the last 90 days. If it has, at the **Previous Test Passed** prompt, click **Yes** to start a **new test**, or click **No** to **continue**. If a new test is to be performed, retrieved, and/or decoded, vehicle information is entered automatically in the **Vehicle Lookup** window.

NOTE: If a vehicle was previously inspected and failed, refer to the section titled **REINSPECTION** later in this chapter.

If an unusual VIN (i.e. less than 17 characters) is entered, the **Unusual VIN** prompt will warn you. To continue with the VIN as entered, click **Yes**, otherwise, click **No** to return to the **Vehicle Lookup** window and reenter the VIN. Click **Continue**.

3. The **Vehicle Information** window opens. The VIN and/or license plate number(s) entered in the Vehicle Lookup window will be automatically inserted in the **VIN** and **License Plate** fields in the **Vehicle Information** window.

   NOTE: If the vehicle was previously inspected but FAILED the inspection, previous vehicle information is automatically entered in the appropriate fields. Refer to the section titled **REINSPECTION** later in this chapter to perform a vehicle retest

   NOTE: You **CANNOT** modify any of the fields in the **Information Only** area.

   Information Only Area:

Field Title	Description
Data Origin	This field is automatically completed depending on information entered in the Vehicle Lookup window. This field will contain information such an Manual Entry, or Prior Inspection (unaltered), etc.
Initial Inspection Date	This field is automatically completed depending on information entered in the Vehicle Lookup window. This field will contain the current date, or if from a prior inspection, the date of the previous inspection.
Former Test Type	This field will display the type of test previously conducted if the initial Inspection Date field is different than the current date. Examples may show OBD, etc.
Vehicle Color	These fields are not completed by the Inspector. The information they contain is generated by the host computer, Station Manager PC, or represents retrieved previous test data for current vehicle.
VIN Check Indicator	
Stolen Vehicle	
Self Inspected Indicator	
GVWR (lbs)	

4. The bottom area of the **Vehicle Information** window is where you will enter vehicle information. Fields with an asterisk (*) are required fields and **MUST** be completed in order to proceed with testing:

   NOTE: Type the first letter of the desired vehicle make and/or vehicle model, which places the highlight bar on the first item on the list starting with that letter.

   Bottom area:

For this field:	Do this:
VIN and/or License Plate	The information will already be filled in (from scanning and/or entering the VIN in the Vehicle Lookup window).
Vehicle Type	Click the dropdown arrow and select the Vehicle Type from the list. NOTE: Selecting Vehicle Type as Truck, Motorcycle or Trailer will cause some required fields to change (i.e. Model will not be a required field for motorcycles and Manufacturers Gross Vehicle Weight Rating (MGVWR) will become a required field for Trucks and Trailers).
Vehicle Year	Enter the 4-digit year of the vehicle under test. Failing to enter the vehicle year as 4 digits will display a prompt that the model year is invalid.
Make	Click the dropdown arrow and select the vehicle Make from the list.
Model	Click the dropdown arrow and select the vehicle Model from the list.
Model Code	The information in the field will already be filled in if available (the information was decoded when you scanned the VIN at the Vehicle Lookup window).
Body Style	Click the dropdown arrow and select the Body Style from the list for the vehicle under test.
Axles	After entering the vehicle Make, Model, and Body Style, this field defaults to 2. Click the dropdown arrow and select the number of Axles (1 thru 5) from the list.
Tractor Trailer	This field defaults to No. Click the dropdown arrow and select Yes or No depending on whether the vehicle under test is a tractor trailer.
Customer	This field defaults to Mandatory. If needed, one of the other customer types may be selected by clicking the dropdown arrow and select the appropriate customer type from the list.
Test Number	This field displays the number of the current test, i.e. 1 for the initial test and 2, 3, 4, etc. for re-tests.

For this field:	Do this:
CERT	Enter the number of the repairer.
Vehicle Class	Click the dropdown arrow and select the vehicle class from the list. Vehicle Class types include: LDGV – Light Duty Vehicle LDGT1 – Light Duty Truck less than or equal to 6000 lbs LDGT2 – Light Duty Truck less than or equal to 8500 lbs HDGV – Heavy Duty Vehicle greater than 8500 lbs
Fuel	Click the dropdown arrow and select the fuel type for the vehicle under test. Fuel types include: Both (Gas and L) Diesel Electric Gasoline LPG/CGN Hybrid (Gas and Electric) Other
Cylinders	Type the number of cylinders or click the dropdown arrow and select the number of cylinders for the vehicle under test. You may need to scroll down to find the correct number.
County	Type the county for the vehicle under test, or click the dropdown arrow and select the count from the list.
Odometer	Type the vehicle mileage.
MGVWR (lbs)	If the vehicle type selection is truck, type the MGVWR in pounds.
Special Tag	If applicable, type the additional plate which has also been assigned to the vehicle.
DOT Number	If applicable, type the DOT number.

5. After entering all the pertinent information in the **Vehicle Information** window, click **Continue** to proceed. The **Confirm Emission Test Selection** window opens.

   NOTE: In the event that a required field was left empty after clicking Continue, the empty field will be highlighted to show you which fields were left blank. If any fields were left blank, enter the information now and click **Continue** again.

The following options are also available:

- **Special** This includes inspections such as: Courtesy, Dealer, DOT, Early Registration, Federal Vehicle, Kit Cars, Police Checks and other inspections (refer to **Chapter 4**, **Special Tests**).
- **212A** Application for Title (refer to the **Printing Form 212A** section described later in this chapter).
- **213** Application for Corrected Title, Duplicate Title and/or Weight Change (refer to the **Printing Form MV213** section described later in this chapter).

Special Tests

1. Once all required information is entered into the **Vehicle Information** window, click **Special**.
2. The **Special Tests** window opens. Click the dropdown arrow in the **Special Type** field and choose one of the following test types:

    - CI Courtesy Inspection
    - DI Dealer Inspection
    - DO Department of Transportation
    - ER Early Registration
    - FV Federal Vehicle
    - KC Kit Car
    - OT Other
    - PC Police Check

3. Next to the Default fields, the system provides a set of special fields displaying the same information as the defaults, but they are not editable. Changing these fields changes the subtests you must perform for the vehicle. Click **Continue**.

4. The **Confirm Emission Test Selection** window opens. Confirm the correct test is highlighted.

Click Continue**. The required test window opens (refer to the appropriate test in this manual).**

Confirm Emission Test Selection

Depending on the vehicle make, model, and year selected, the required test will be highlighted. Confirm the correct test is highlighted and click **Continue** to proceed (or click **Abort** to return to the **Main Menu**). The required test window opens.

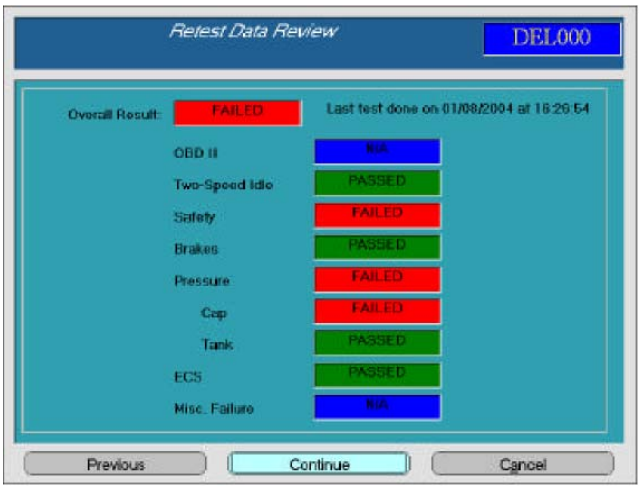
If you select a test other than the test required, the **Override** window opens and states that a vehicle subtest alteration is required. Click **Yes** to override the subtest and continue with the test you selected (or click **No** to return to the **Confirm Emission Test Selection** window).

Reinspection

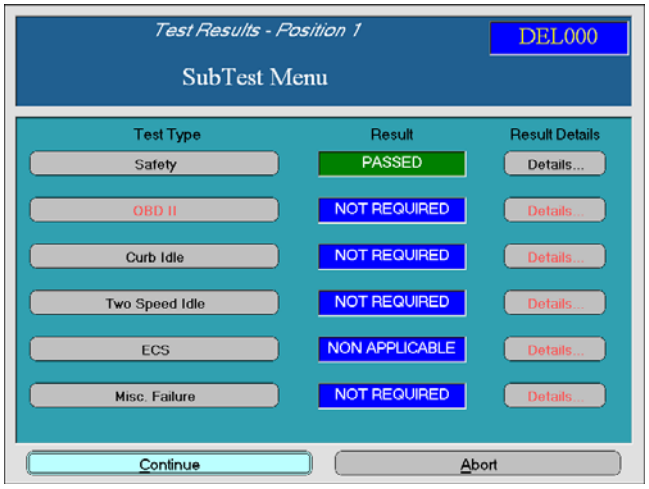
If a vehicle was previously inspected and PASSED within the last 90 days, at the **Previous Test Passed** prompt you can start an initial test.

If a vehicle was previously inspected and FAILED:

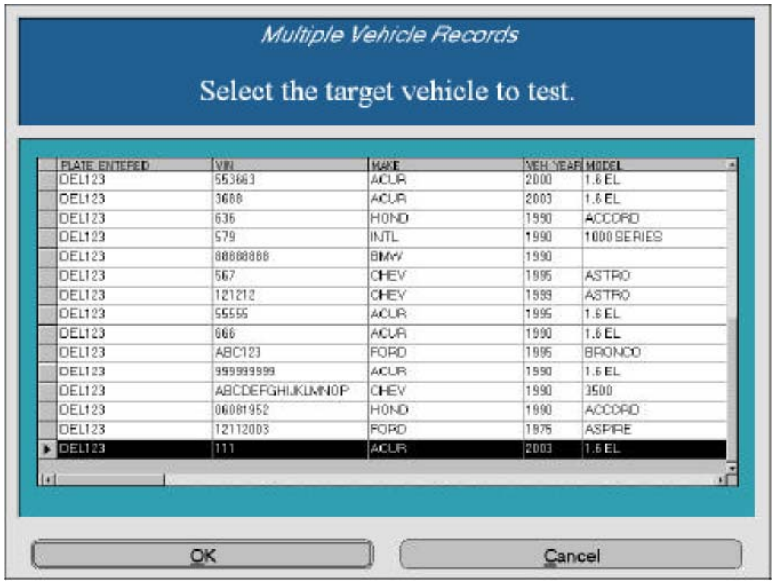
1. Following vehicle Information entry (refer to the section titled **Entering Vehicle Criteria** earlier in this chapter), the **Retest Data Review** window opens.



2. Click **Continue** and the previously failed test(s) are automatically selected to be performed.
3. Perform the test(s) as required.
4. When completed, the **SubTest Menu** window opens and displays the Test Results for Position 1.



5. Following entry of the VIN and License Plate data (refer to the section titled **Entering Vehicle Criteria** earlier in this chapter), the Multiple Vehicle Records window opens.



6. If the vehicle previously tested is listed, highlight the target vehicle to test and click **OK**. The **Main Menu** opens.

EMISSIONS TESTS

Based on the vehicle information entered into the system, you will perform one of the following emissions tests: Curb Idle, Two Speed Idle, or OBD II. You can restart any emissions test that times out. **ALL** required QA checks must be performed and passed before an emissions test will be allowed by the analyzer.

Hang-up Test

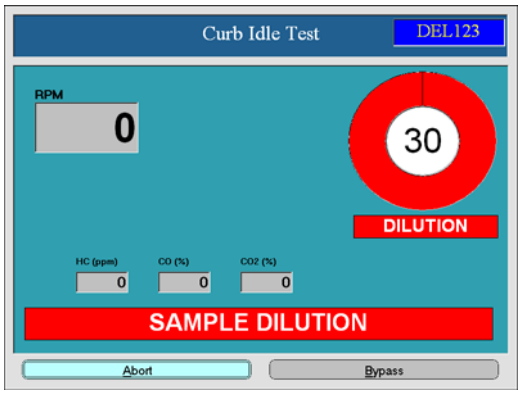
Before starting the Curb Idle or Two Speed Idle Emissions Tests, the analyzer runs a Hang-up Test, preceded by an automated zero calibration and ambient air sampling (Auto-Zero/HC Hang-up Test). The Hang-up Test is run at the beginning of each test to ensure the vehicle does not fail inspection because of a dirty vehicle previously tested.

1. At the start of the Hang-up Test, ensure the probe is removed from the exhaust. The computer will cycle through a series of messages (the first line states: **Hangup in Progress)**. Wait for the test to complete.
2. When the Hang-up Test completes, the **Curb Idle Test** or the **Two Speed Idle Test** will begin (refer to the appropriate test in this chapter).

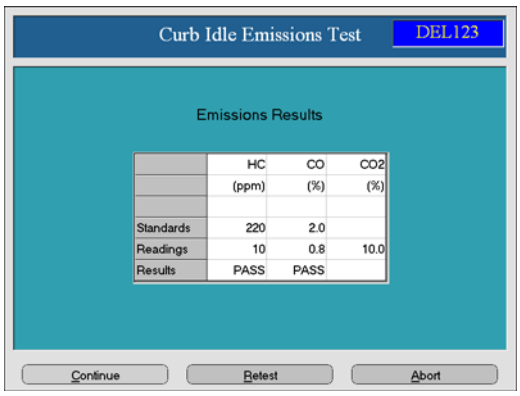
Curb Idle Test

The Curb Idle Emissions Test consists of a maximum 30-second sampling period. After satisfying the dilution check, a 30-second timer begins counting down and the analyzer samples the vehicle exhaust during that time.

1. Follow the instructions on the **Curb Idle Emissions Test** window, and then click **Continue**.
2. The **Curb Idle Emissions Test** window goes through a series of functions. Wait for the test to complete.
    a. Until sample dilution is satisfied, the message: **SAMPLE DILUTION** will display and the timer will not begin to countdown (see example below).



3. Wait for the testing process to complete.
    a. The Curb Idle Emissions Test has a 145-second maximum duration. If a valid sample is **NOT** obtained within 145-seconds, the Curb Idle Test will time out and the Result will be a FAIL. A special message will be printed on the VIR indicating a valid exhaust sample was not obtained. (The message will appear under the MISCELLANEOUS FAILURE ITEMS section of the VIR. Refer to **Chapter 5, Inspecting a Vehicle – Position 2** for an example of a VIR.)
    b. If the sample is valid and the HC and CO readings are less than the emissions standards for the VUT after 15 seconds, a Fast Pass will be issued and the vehicle will move on to the next required subtest.



c. If the sample is valid and the vehicle's emissions of HC or CO are greater than Fast Fail standards, the vehicle will Fast Fail and move on to the required subtest. Click **Retest** to run the test again, begin at **Step 1**; or click **Continue** to proceed to the required subtest.

4. When the test is completed, the **Emissions Results** display, click **Continue**.
5. The **Curb Idle Emissions Test** window opens and prompts you to remove the sample probe from the tailpipe and disconnect the RPM probe. Follow the instructions and click **Continue**.
6. The required Safety Test window opens (refer to the appropriate Safety Test in this chapter).

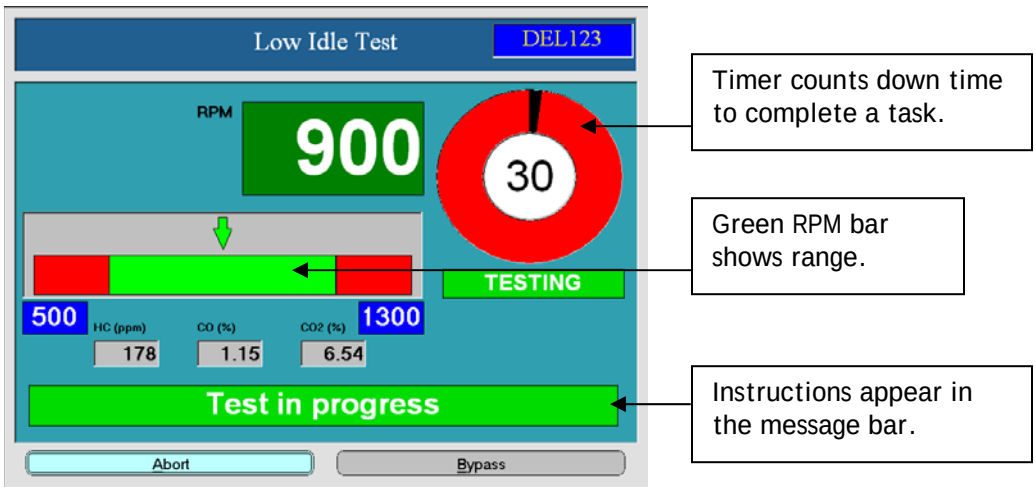
NOTE: When all required tests have been completed, the **Main Menu** window opens.

NOTE: From the **SubTest Menu** window, you can also click one of the test buttons. If the test you selected is not required, the **Override** dialog box opens. Click **Yes**. The selected test window opens (refer to the appropriate test in this chapter). Click **No** to return to the **SubTest Menu** window.

Two Speed Idle (TSI) Test

This test consists of a Low Idle and a High Idle sequence and uses either a contact or non-contact probe to read RPMs. If both devices are unable to read the vehicle's RPM, selection of the F8 key will override the RPM and allow the emissions test to continue.

1. Follow the instructions on the **Two Speed Idle Emissions Test** window, and then click **Continue**.
2. The **Two Speed Idle Emissions Test** goes through a series of functions. Wait for the testing process to complete.
   a. The Low Idle test is conducted while the vehicle is idling between 500 and 1300 RPM. Keep the RPM in the green zone for the 30 second countdown.

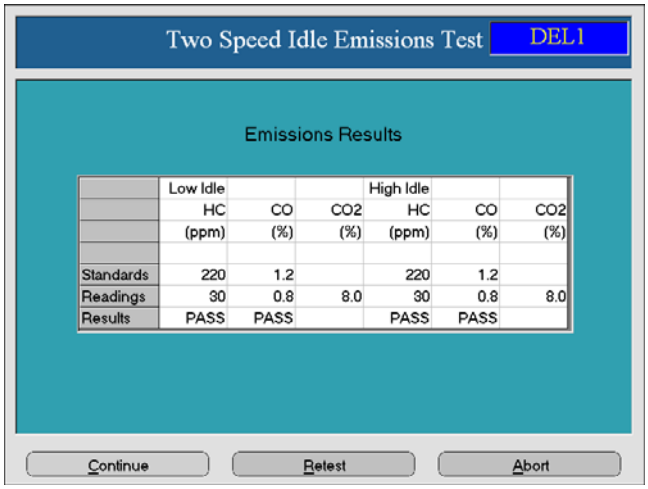


   - If the RPM is out of range (i.e. in the red zone – too low or too high), a prompt will notify you that the RPM is invalid. Adjust the vehicle's throttle to bring the arrow within the green bar.

   NOTE: Press the **F8** key on the keyboard to override the RPM.

   b. The High Idle test is conducted while the vehicle is idling between 2200 and 2800 RPM. The following message will be displayed during the timer countdown: **Test in progress**.

c. If the sample is valid and the HC and CO readings are less than the emissions standards after 15 seconds, a Fast Pass will be issued.



d. If the sample is valid and the vehicle's emissions of HC or CO are greater than Fast Fail standards, the vehicle will Fast Fail and move on to the required subtest. Click **Retest** to run the test again, begin at **Step 1**; or click **Continue** to proceed to the required subtest.

3. When the test is completed, The **Emissions Results** display, click **Continue**.
4. The **Two Speed Idle Emissions Test** window opens and prompts you to remove the sample probe from the tailpipe and disconnect the RPM probe. Follow the instructions and click **Continue**.
5. The required Safety Test window opens (refer to the appropriate Safety Test in this chapter).

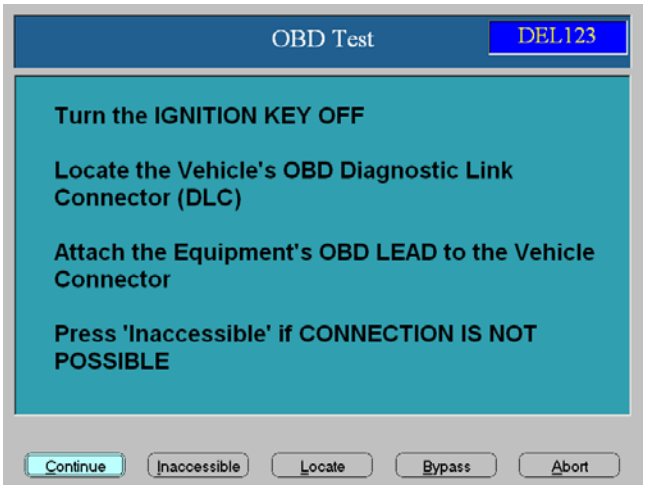
NOTE: When all required tests have been completed, the **Main Menu** window opens.

NOTE: From the **SubTest Menu** window, you can also click one of the test buttons. If the test you selected is not required, the **Override** dialog box opens. Click **Yes**. The selected test window opens (refer to the appropriate test in this chapter). Click **No** to return to the **SubTest Menu** window.

OBD II Test

If the model year of the vehicle is 1996 or newer, an On-Board Diagnostics Test will be performed.

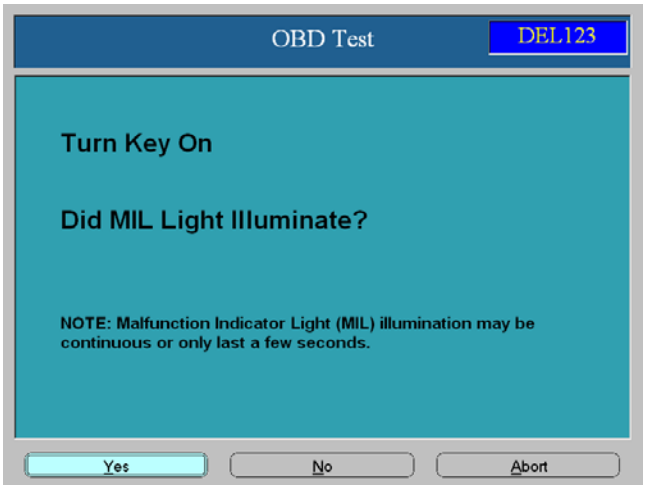
1. Follow the instructions on the **OBD II Test** window, and then click **Continue** to proceed with the OBD Test:



NOTE: If a connection is not possible, click **Inaccessible** or **Locate** and proceed to the **DLC Connection** and **Locating the DLC** sections in this chapter.

NOTE: The OBD II Test can be bypassed at this point. Click **Bypass** and proceed to **Step 7** where the OBD II test will indicate **Fail**.

2. Follow the instructions on the next OBD Test screen:



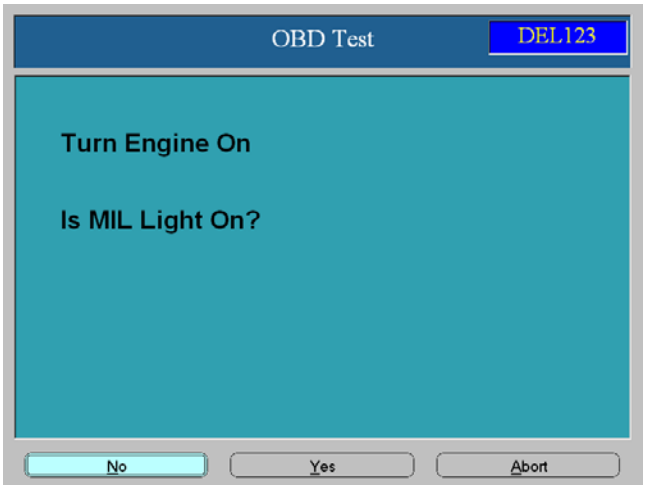
NOTE: The MIL illumination may be continuous or last only a few seconds.

a. If the MIL illuminated, click **Yes** to proceed.

b. If the MIL did not illuminate, click **NO**. Turn the ignition key **OFF** and click **Continue** to proceed.

c. Leave the engine off for 30 seconds, and then repeat **Step 2**.

3. Follow the instructions on the following screen and click **Yes** or **No** to proceed. Wait as communication is established:



4. If OBD communication cannot be confirmed, the following screen displays:

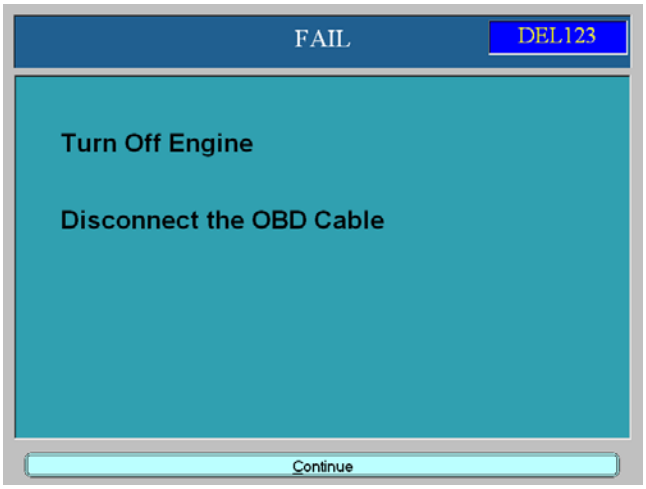
a. Follow the instructions on the screen.

b. Click **Retry** to proceed.

NOTE: A communication failure means that the OBD interface failed to successfully establish communication with the vehicle in a minimum of 2 attempts, or if there is a communication error detected on at least 2 attempts.

5. If communication still cannot be confirmed, click **Continue** which will be available after the 3rd communication attempt (see example below):

6. The following screen will display:



   a. Follow the instructions on the screen.

   b. Click **Continue** to proceed to the **Safety Test**.

7. Wait for the testing process to complete.

    a. When the **Did MIL Light Illuminate?** message displays, if the MIL illuminated, click **Yes** to continue. If the MIL did **NOT** illuminate, click **No** to continue. Whether you click Yes or No, continue to follow the instructions on each window.

    NOTE: The MIL illumination may be continuous or last only a few seconds.

8. When the test is completed, the **Pass or Fail** window opens.

    a. If **Pass**, click Continue.

    b. If **Fail**, follow the instructions and click Continue.

9. The required Safety Test window opens (refer to the appropriate Safety Test in this chapter).

    NOTE: When all required tests have been completed, the **Main Menu** window opens.

    NOTE: From the **SubTest Menu** window, you can also click one of the test buttons. If the test you selected is not required, the **Override** dialog box opens. Click **Yes**. The selected test window opens (refer to the appropriate test in this chapter). Click **No** to return to the **SubTest Menu** window.

DLC Connection

Inaccessible DLC Connection

During the OBD II Test, if a connection is not possible:

1. From the **OBD Test** window, click **Inaccessible**. The **OBD Test** window will display the following message: **Select Reason DLC Can Not Be Connected**.
2. Select the reason the Diagnostic Link Connector can not be connected. If none of the reasons apply, click **Previous Screen**.
3. If you select **D**, **L**, **M** or **O**, the **Override Required** window opens. Enter the **Inspector ID** and **Password**. Click **OK** to proceed.

   NOTE: If **A** or **T** are selected, no override is required. The vehicle will **Fail** the OBD Test.

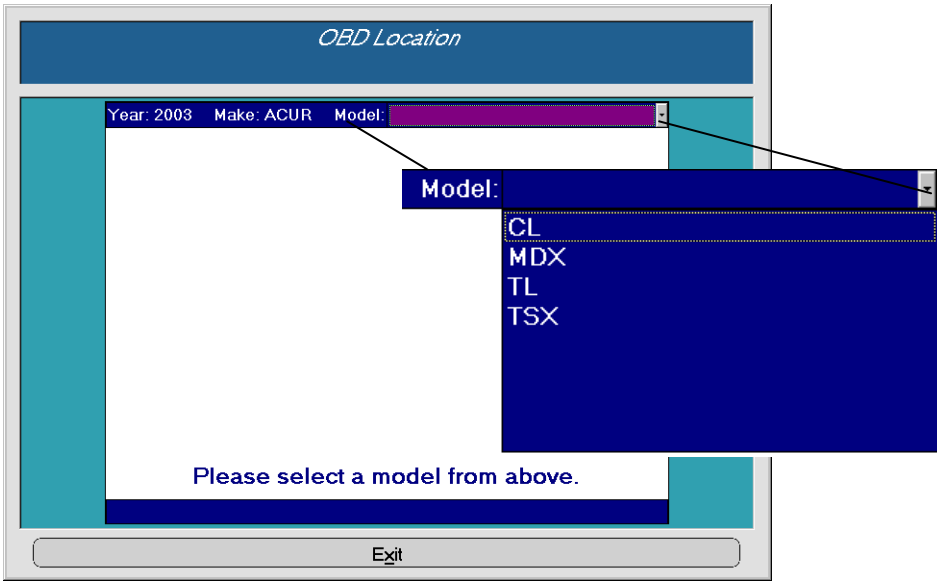
   - D = Motorist is disabled and unable to leave the vehicle. The OBD Test will be based on the result of the KOEO and KOER subtests
   - L = DLC cannot be located. The OBD Test will be halted, then downgraded to the appropriate idle test.
   - M = MIL ONLY Test, allows a Pass based only on MIL status. OBD Test is completed and a special VIR message is printed.
   - O = DLC is an Original Equipment Manufacturer (OEM) and is inaccessible (i.e. access to the DLC is blocked by a feature of the original vehicle design cover, etc.). The OBD Test will be halted, then downgraded to the appropriate idle test.
   - A = DLC is an aftermarket DLC and is inaccessible. The vehicle will fail the OBD test.
   - T = DLC has been tampered with (damaged or missing). The vehicle will fail the OBD Test.

4. The **Pass or Fail** window opens.
   a. Click **Continue**. The **SubTest Menu** window opens.

Locating the DLC

During the OBD II Test, if the Diagnostic Link Connector (DLC) can not be located:

1. From the **OBD Test** window, click **Locate**. The **OBD Location** window opens and displays information based upon the model year, make, and model of the vehicle.



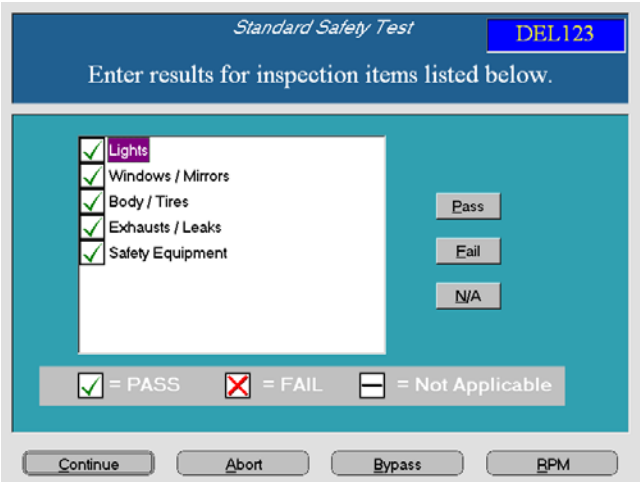
2. Click the dropdown arrow and select the vehicle model to bring up the OBD location for the vehicle. The window will display a picture indicating where to locate the DLC for the vehicle. The specific location will be circled and a written description will display directly under the picture.

3. After identifying the DLC location for the vehicle, click **Exit**. The **OBD Test** window opens at the beginning of the OBD Test.

OBD Communication Failure

1. If OBD communication can NOT be confirmed, the **OBD Test** window displays the following message: **OBD Communication Cannot Be Confirmed, Readjust Connector And Try Again**. Click **Retry** to proceed.
2. **NOTE**: A communication failure means that the OBD interface failed to successfully establish communication with the vehicle in a minimum of 2 attempts, or if there is a communication error detected on at least 2 attempts.
3. If communication still can NOT be confirmed, click **Continue** (which will be available after the 3rd communication attempt).
4. Turn the engine off and disconnect the OBD cable.
5. Click **Continue** to proceed to the Safety Test.

SAFETY TEST



Depending on the type of vehicle, one of the following Safety Tests will be performed:

1. Standard Safety Test
2. Motorcycle Safety Test
3. School Bus Safety Test

Standard Safety Test

1. On the **Standard Safety Test** window, the second line in the title area states: **Enter results for inspection items listed below**.
2. The major components that will be tested are displayed in the Standard Safety Test display.
3. Click (highlight) each category to display the items to be inspected. Begin by highlighting a safety inspection item, then click one of the following results:
   - **Pass** to pass the item being inspected, and insert a **green checkmark**.

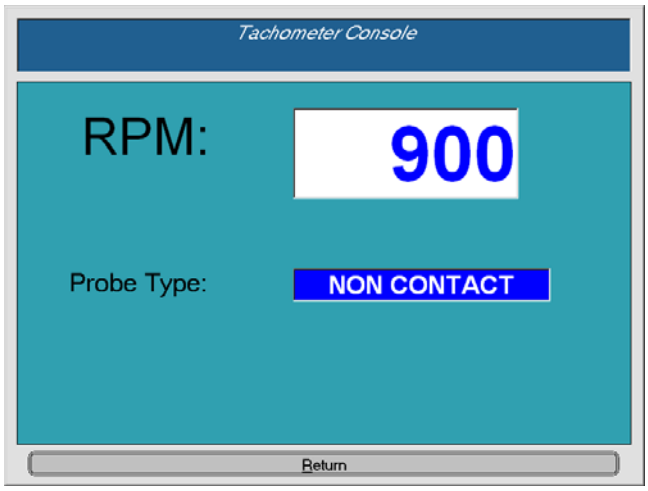
- **Fail to fail the item being inspected, and insert a red X.**
- **Not Applicable if the item being inspected is not applicable, and insert a dash.**

The Pass, Fail, or N/A entry is noted in the main category, indicated by the checkmark, X, or dash.

4. Upon completion of the Standard Safety Test, click **Continue**.
5. The **SubTest Menu** window opens to complete the next required test. Click **Continue**. One of the required test windows automatically opens (refer to the appropriate test in this chapter).

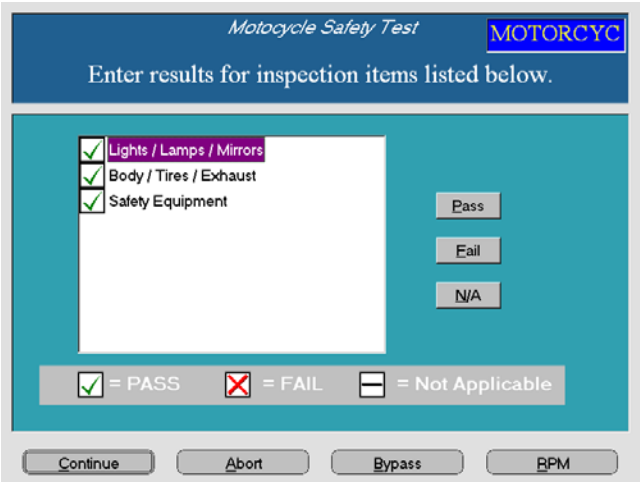
   If all required tests have been completed, the **Main Menu** window opens.

   NOTE: You can use the RPM function by clicking **RPM** in the **Standard Safety Test** window. The **Tachometer Console** window opens. The Tachometer Console window displays the RPM and Probe Type as Contact or Non Contact. Click **Return** to return to the **Standard Safety Test** window.



Motorcycle Safety Test

1. On the **Motorcycle Safety Test** window, the second line in the title area states: **Enter results for inspection items listed below.**
2. The major components that will be tested in the Motorcycle Safety Test display as follows:



3. Click (highlight) each category to display the items to be inspected. Begin by highlighting a safety inspection item, then click one of the following results:
   - **Pass** to pass the item being inspected, and insert a **green checkmark**.
   - **Fail** to fail the item being inspected, and insert a **red X**.
   - **Not Applicable** if the item being inspected is not applicable, and insert a **dash**.

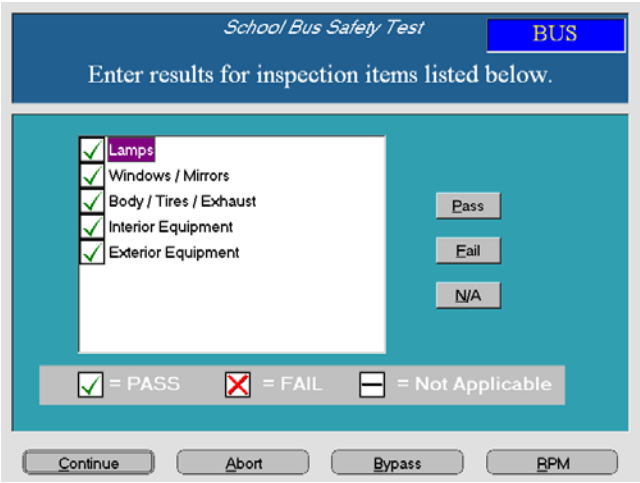
   The Pass, Fail, or N/A entry is noted in the main category, indicated by the checkmark, X, or dash.

4. Upon completion of the Motorcycle Safety Test, click **Continue**.
5. The **SubTest Menu** window opens to complete the next required test. Click **Continue**. One of the required test windows automatically opens (refer to the appropriate test in this chapter).

   If all required tests have been completed, the **Main Menu** window opens.

School Bus Safety Test

1. On the **School Bus Safety Test** window, the second line in the title area states: **Enter results for inspection items listed below.**
2. The major components that will be tested in the School Bus Safety Test display as follows:



3. Click (highlight) each category to display the items to be inspected. Begin by highlighting a safety inspection item, then click one of the following results:
   - **Pass** to pass the item being inspected, and insert a **green checkmark**.
   - **Fail** to fail the item being inspected, and insert a **red X**.
   - **Not Applicable** if the item being inspected is not applicable, and insert a **dash**.

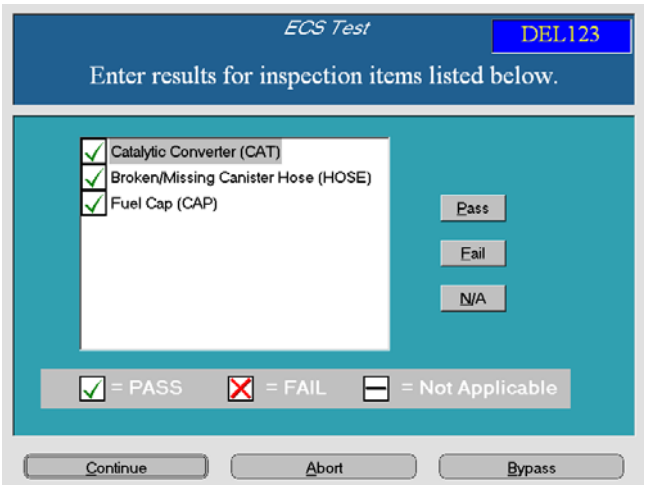
   After selecting the safety inspection item from the dropdown list, the Pass, Fail, or N/A entry is noted in the main category, indicated by the checkmark, X, or dash.
4. Upon completion of the School Bus Safety Test, click **Continue**.
5. The **SubTest Menu** window opens to complete the next required test. Click **Continue**. One of the required test windows automatically opens (refer to the appropriate test in this chapter).

   If all required tests have been completed, the **Main Menu** window opens.

EMISSION CONTROL SYSTEM (ECS) TEST

The ECS test is performed at Position 1 after the Safety Test (or at Position 2 after the Brake Test). This test is a visual inspection of the pollution control equipment.

1. On the **ECS Test** window, the second line in the title area states: **Enter results for inspection items listed below.**
2. The major components that will be tested in the ECS Test display as follows:



5. Click (highlight) each category to display the items to be inspected. Begin by highlighting an ECS inspection item, then click one of the following results:
   - **Pass** to pass the item being inspected, and insert a **green checkmark**.
   - **Fail** to fail the item being inspected, and insert a **red X**.
   - **Not Applicable** if the item being inspected is not applicable, and insert a **dash**.
6. Upon completion of the ECS Test, click **Continue**. The **Main Menu** window opens.

   NOTE: From the **SubTest Menu** window, you can also click one of the test buttons. If the test you selected is not required, the **Override** dialog box opens. Click **Yes**. The selected test window opens (refer to the appropriate test in this chapter). Click **No** to return to the **SubTest Menu** window.

TEST RESULTS – POSITION 1

The Test Results from Position 1 are displayed in the **SubTest Menu** window. The SubTest Menu window has three columns: **Test Type**, **Result**, and **Result Details**.

To view the test results for each test.

1. From the **SubTest Menu** window, in the Result Details column, click **Details** for the Test Type category you want to view. The window will display the results for that particular test.
2. When you are finished viewing a test result, click **Continue** to return to the **SubTest Menu** window.
3. To view another test result, follow **Step 1 and 2** above.
4. When you have finished viewing the test results, from the **SubTest Menu** window, click **Continue**. The **Main Menu** opens.

PRINTING FORMS 212A AND 213

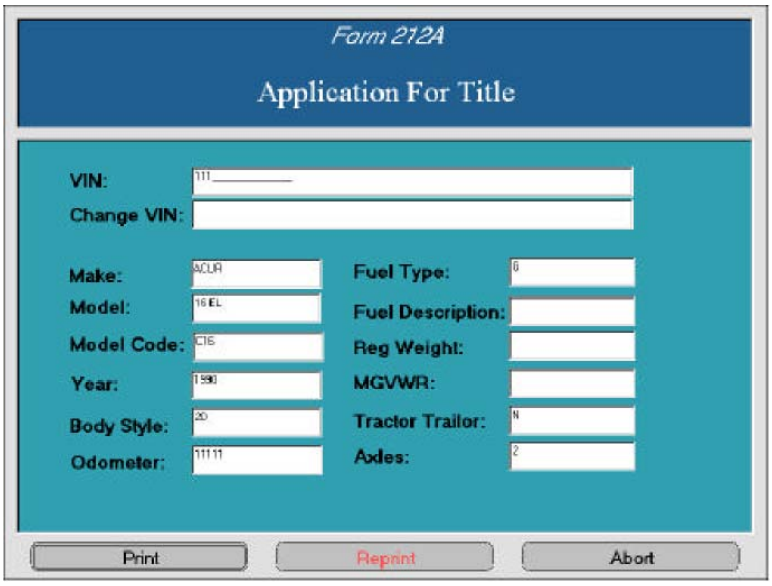
At Position 1, you will have the option to complete and print two forms, Form 212A and Form MV213, and transmit all applicable data to the Station Manager PC. The Station Manager will then transmit the data to the DMV mainframe.

To print Form 212A, Application for Title:

1. From the **Main Menu**, click **Test Vehicle**.
2. The **Vehicle Lookup** window opens. Enter the **VIN** and **License Plate** in the appropriate fields. Click **Continue**.
3. The **Vehicle Information** window opens. Fill in all required fields that are blank. Click **212A**.
4. The **Application For Title** window opens.

   NOTE: Vehicle data previously entered in the Vehicle Information window is automatically entered into the appropriate fields.

   Enter the new **Vehicle Identification Number** into the **VIN** field, if required.

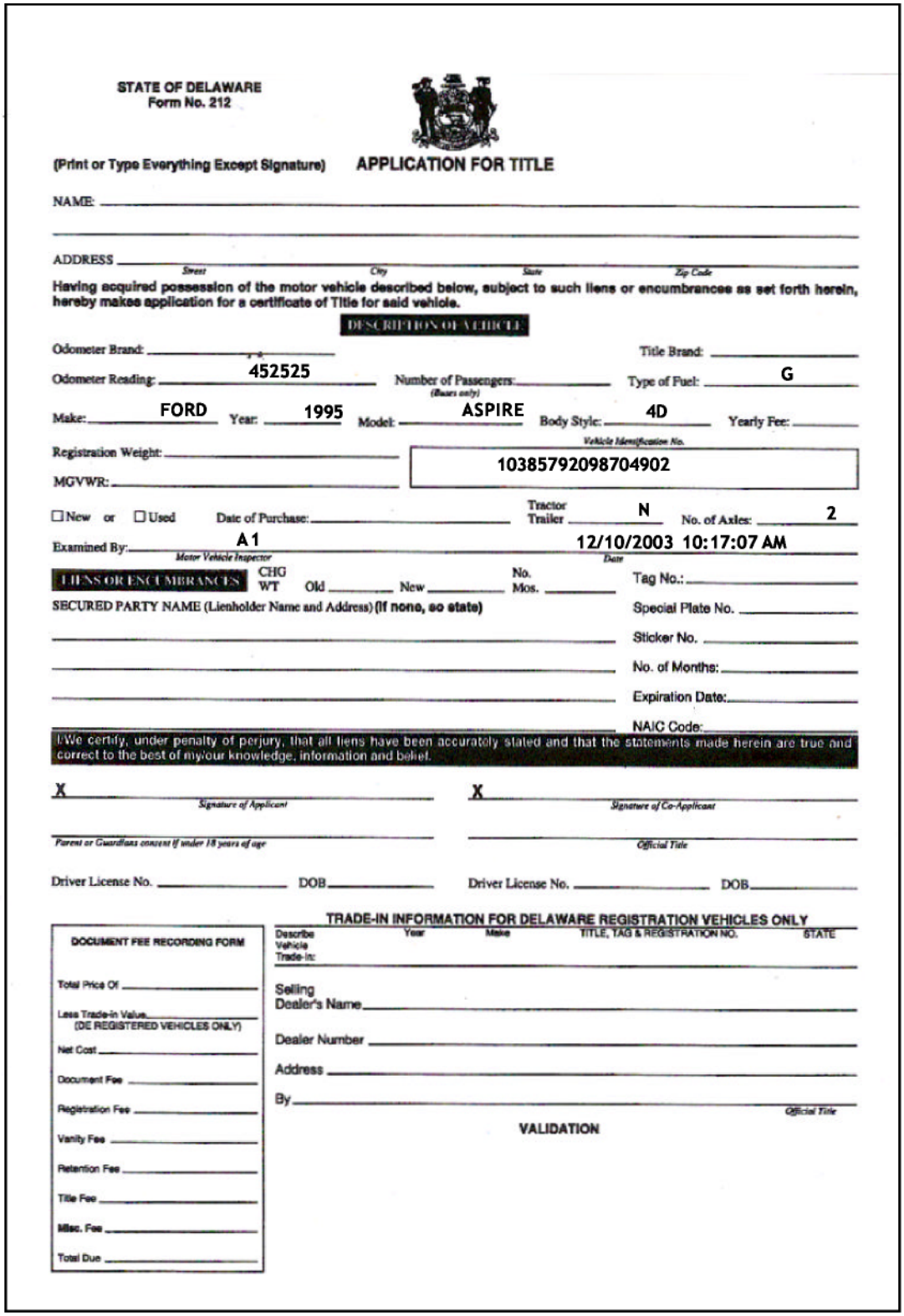


5. Click **Print** to print the **Application For Title** form.

   NOTE: Preprinted forms are located in the secondary tray of the Position 1 printer.

6. The **Print** dialog box opens. Click **Yes** to print the form.
7. The **Vehicle Information** window opens. Click **212A.**
8. The **Application For Title** window opens. Click **Reprint** to print another copy of the form.

Form 212A:



STATE OF DELAWARE
Form No. 212

(Print or Type Everything Except Signature) **APPLICATION FOR TITLE**

NAME: _____

ADDRESS _____
Street City State Zip Code

Having acquired possession of the motor vehicle described below, subject to such liens or encumbrances as set forth herein, hereby makes application for a certificate of Title for said vehicle.

DESCRIPTION OF VEHICLE

Odometer Brand: _____ Title Brand: _____

Odometer Reading: 452525 Number of Passengers: _____ (Buses only) Type of Fuel: G

Make: FORD Year: 1995 Model: ASPIRE Body Style: 4D Yearly Fee: _____

Registration Weight: _____ Vehicle Identification No.: 10385792098704902

MGVWR: _____

☐ New or ☐ Used Date of Purchase: _____ Tractor Trailer N No. of Axles: 2

Examined By: A1 (Motor Vehicle Inspector) 12/10/2003 10:17:07 AM (Date)

LIENS OR ENCUMBRANCES CHG WT Old _____ New _____ No. Mos. _____ Tag No.: _____

SECURED PARTY NAME (Lienholder Name and Address) **(If none, so state)** Special Plate No. _____

_____ Sticker No. _____

_____ No. of Months: _____

_____ Expiration Date: _____

_____ NAIC Code: _____

I/We certify, under penalty of perjury, that all liens have been accurately stated and that the statements made herein are true and correct to the best of my/our knowledge, information and belief.

X _____ (Signature of Applicant) X _____ (Signature of Co-Applicant)

_____ (Parent or Guardians consent if under 18 years of age) _____ (Official Title)

Driver License No. _____ DOB _____ Driver License No. _____ DOB _____

DOCUMENT FEE RECORDING FORM

Total Price Of _____

Less Trade-in Value _____
(DE REGISTERED VEHICLES ONLY)

Net Cost _____

Document Fee _____

Registration Fee _____

Vanity Fee _____

Retention Fee _____

Title Fee _____

Misc. Fee _____

Total Due _____

TRADE-IN INFORMATION FOR DELAWARE REGISTRATION VEHICLES ONLY

Describe Vehicle Trade-in: Year Make TITLE, TAG & REGISTRATION NO. STATE

Selling Dealer's Name _____

Dealer Number _____

Address _____

By _____ (Official Title)

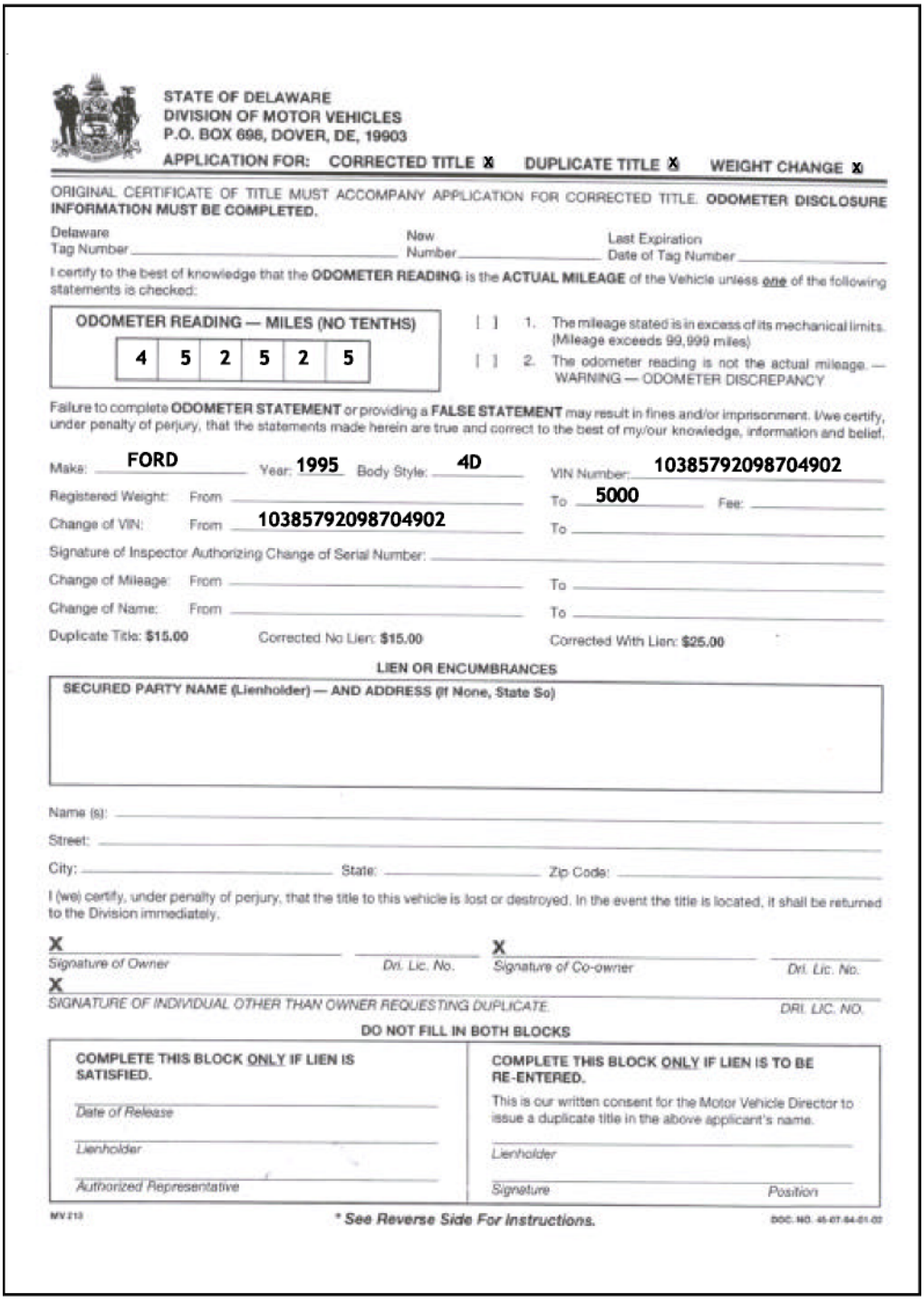
VALIDATION

To print Form MV213:

1. To print a **corrected** Title:
    a. From the **Application For** window, select **Corrected Title**.
    b. The **Application For: Corrected Title** window opens. Enter the correct information, if required.
    c. Click **Print.** The **Print** dialog box opens. Click **Yes** to print the form.
    d. After the form has finished printing, click **Reprint** to print another copy of the form.
2. To print a **duplicate** Title:
    a. From the **Application For** window, select **Duplicate Title**.
    b. The **Application For: Duplicate Title** window opens.
    c. Click **Print**. The **Print** dialog box opens. Click **Yes** to print the form.
    d. After the form has finished printing, click **Reprint** to print another copy of the form.
3. To print a Title with a **weight change**:
    a. From the **Application For** window, select **Weight Change**.
    b. The **Application For: Weight Change** window opens. Enter the correct weight.
    c. Click **Print**. The **Print** dialog box opens. Click **Yes** to print the form.
    d. After the form has finished printing, click **Reprint** to print another copy of the form.

NOTE: From the Application For window, select Corrected Title, Duplicate Title, and/or Weight Change to view a combination of the selected items. You can also select Corrected Title, Duplicate Title, and/or Weight Change from any of the three windows.

Form MV213:



STATE OF DELAWARE
DIVISION OF MOTOR VEHICLES
P.O. BOX 698, DOVER, DE, 19903

APPLICATION FOR: CORRECTED TITLE X DUPLICATE TITLE X WEIGHT CHANGE X

ORIGINAL CERTIFICATE OF TITLE MUST ACCOMPANY APPLICATION FOR CORRECTED TITLE. **ODOMETER DISCLOSURE INFORMATION MUST BE COMPLETED.**

Delaware Tag Number _____ New Number _____ Last Expiration Date of Tag Number _____

I certify to the best of knowledge that the **ODOMETER READING** is the **ACTUAL MILEAGE** of the Vehicle unless one of the following statements is checked:

ODOMETER READING — MILES (NO TENTHS)

4	5	2	5	2	5

[ ] 1. The mileage stated is in excess of its mechanical limits. (Mileage exceeds 99,999 miles)

[ ] 2. The odometer reading is not the actual mileage. — WARNING — ODOMETER DISCREPANCY

Failure to complete **ODOMETER STATEMENT** or providing a **FALSE STATEMENT** may result in fines and/or imprisonment. I/we certify, under penalty of perjury, that the statements made herein are true and correct to the best of my/our knowledge, information and belief.

Make: FORD Year: 1995 Body Style: 4D VIN Number: 10385792098704902

Registered Weight: From _____ To 5000 Fee: _____

Change of VIN: From 10385792098704902 To _____

Signature of Inspector Authorizing Change of Serial Number: _____

Change of Mileage: From _____ To _____

Change of Name: From _____ To _____

Duplicate Title: **$15.00** Corrected No Lien: **$15.00** Corrected With Lien: **$25.00**

LIEN OR ENCUMBRANCES

SECURED PARTY NAME (Lienholder) — AND ADDRESS (If None, State So)

Name (s): _____

Street: _____

City: _____ State: _____ Zip Code: _____

I (we) certify, under penalty of perjury, that the title to this vehicle is lost or destroyed. In the event the title is located, it shall be returned to the Division immediately.

X _____ _____ X _____ _____
Signature of Owner *Dri. Lic. No.* *Signature of Co-owner* *Dri. Lic. No.*

X _____ _____
SIGNATURE OF INDIVIDUAL OTHER THAN OWNER REQUESTING DUPLICATE. *DRI. LIC. NO.*

DO NOT FILL IN BOTH BLOCKS

COMPLETE THIS BLOCK ONLY IF LIEN IS SATISFIED.

Date of Release

Lienholder

Authorized Representative

COMPLETE THIS BLOCK ONLY IF LIEN IS TO BE RE-ENTERED.

This is our written consent for the Motor Vehicle Director to issue a duplicate title in the above applicant's name.

Lienholder

Signature *Position*

MV 213 * *See Reverse Side For Instructions.* DOC. NO. 45-07-84-01-02

ABORTING AN INSPECTION

When a test needs to be aborted for any reason, click **Abort**.

The **Are you sure you want to abort now?** dialog box opens to confirm that the test is to be aborted. Click the dropdown arrow to highlight the abort reason, and then click **Yes** to abort the inspection.

The **Test Result** window will display the test as **ABORT**.

An Aborted test will not print a VIR.

TRANSFERRING TO POSITION 2

Once all appropriate testing is completed at Position 1, data is automatically transferred to Position 2 for test completion. At Position 2, the operator is prompted that a vehicle is waiting for further testing.

Proceed to **Chapter 5, Inspecting a Vehicle – Position 2**.

Chapter 5 Inspecting a Vehicle – Position 2

OVERVIEW

The Position 2 monitor will display the **Vehicle Lookup** window for the next vehicle to be tested. You will be informed that a vehicle is waiting for further testing: after the system locates a vehicle to finish testing, the License Plate of the vehicle under test will display.

You may perform a Brake Test, and/or Pressure Tests, and print a Vehicle Inspection Report (VIR). You may also perform a Safety Review (if a Safety Test was performed at Position 1), and an ECS Test (if this test was not performed at Position 1).

NOTE: During the inspection process, if a test needs to be aborted for any reason, click **Abort**. No VIR will be printed.

NOTE: If necessary, a test can also be bypassed. To bypass a test, click **Bypass**. The **Are you sure you want to bypass the test now?** window opens. Click **Yes** and proceed to the next test. All tests that are bypassed are considered to have FAILED the subtest.

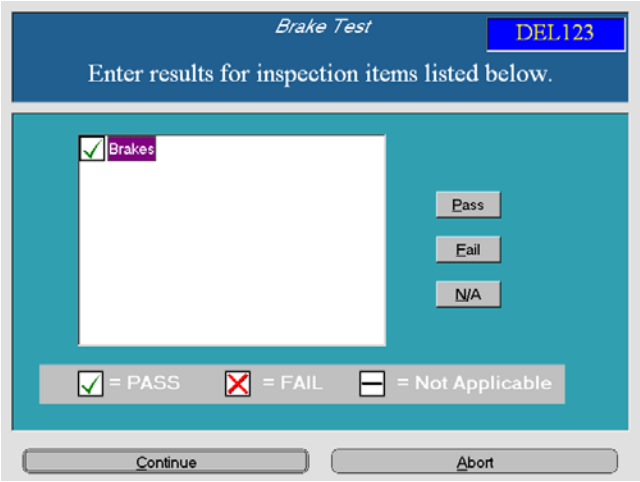
PREPARING FOR A TEST

1. Before you perform a test, maintenance or calibrations may be required on some equipment. Refer to **Chapter 7, Maintenance and Troubleshooting**.
2. To logon to the system, refer to **Chapter 3, Daily Start Up**.
3. To view a sample of the **Main Menu**, refer to **Chapter 3, Daily Start Up.** The Main Menu options are the same for Position 1 and Position 2.
4. To clear any lockouts, refer to **Chapter 7**, **Maintenance and Troubleshooting**.
5. To start testing, from the **Main Menu**, click **Test Vehicle**.

BRAKE TEST

The Brake Test, if performed, will be part of the overall test result.

1. At the **Brake Test** window, enter the test results:
    a. Click (highlight) **Brakes**. After highlighting Brakes, click one of the following results (which will insert a green checkmark, red X, or a dash in the box located next to Brakes):
        - **Pass** to pass the Brake Test, which will insert a **green checkmark**.
        - **Fail** to fail the Brake Test, which will insert a **red X**.
        - **Not Applicable** if the Brake Test is not applicable, which will insert a **dash**.
    b. After selecting Pass, Fail, or N/A, the test result entry is indicated by the checkmark, X, or dash.



2. Upon completion of the Brake Test, click **Continue**. The **Standard Safety Test Review** window opens (refer to the **Safety Test Review** section in this chapter).

EMISSIONS CONTROL SYSTEM (ECS) TEST

NOTE: An ECS Test is NOT required on all vehicles.

If an ECS Test is required, but was not performed at Position 1, the test must be completed at Position 2 after the Brake Test. Refer to **Chapter 4, Inspecting a Vehicle – Position 1**.

SAFETY TEST REVIEW

If a Safety Test was performed at Position 1, a Safety Test Review is performed at Position 2. The Safety Test Review displays the results from Position 1. You can change a previously entered Passed result in the Standard Safety Test Review window.

1. From the **Standard Safety Test Review** window, check to ensure the correct results display.
2. After viewing the test results and confirming the test results, click **Continue**. The **Test Results** window opens (refer to the **Final Test Results – Position 2** section in this chapter.

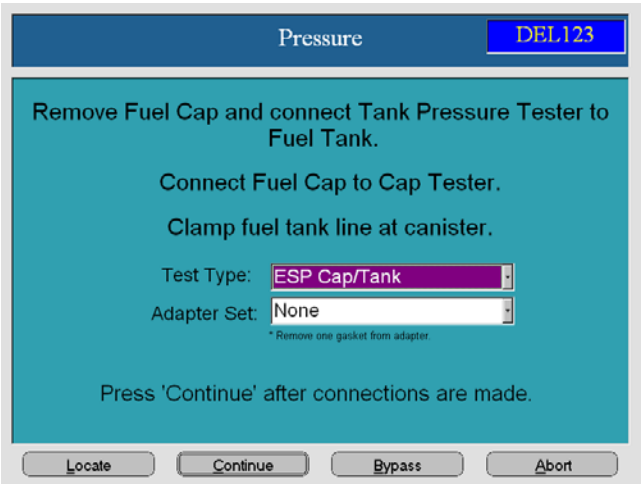
PRESSURE TEST

The Pressure Test checks the integrity of the Fuel Vapor Recovery System from the gas tank to the evaporative canister. It also performs a pressure check on the tank's gas cap, if required. The Pressure Test consists of the Cap Pressure Test, the Tank Pressure Test, or both.

1. From the **Pressure** window, using the dropdown arrow, select the number of fuel caps to be tested. Click **OK** to continue.

   NOTE: If more than one fuel cap is selected, the Fuel Cap Pressure Test will be repeated, but the Tank Pressure Test will not be performed.

2. The Pressure window displays a series of messages, and you will be prompted to perform various manual tasks (see the example below).



3. Remove the Fuel Cap and connect the Tank Pressure Tester to the Fuel Tank.

4. Connect the Fuel Cap to the Cap Tester.
5. Open the hood of the vehicle and clamp the fuel tank line at the canister.

   NOTE: Refer to the **Canister Location** section in this chapter for instructions on locating the canister for the current vehicle.
6. In the **Test Type** field, use the dropdown arrow to select:
   - None
   - ESP Cap Only (Tank Status will show N/A at the Tank Status field)
   - ESP Cap/Tank
   - ESP Tank Only (Cap Status will show N/A at the Cap Status field)
7. In the **Adapter Set** field, use the dropdown arrow to select:
   - None
   - Red
   - Gray
   - Yellow
   - Black
   - Green
   - Orange
   - Blue
   - Brown

   NOTE: The gas cap adapters provided are color coded based on the make, model, and year of the vehicle. The system will automatically select the color code for most vehicles.

   NOTE: If the **Test Type** and **Adapter Set** fields are selected as **None**, proceed to the **Final Test Results** section later in this chapter.
8. After connections are made, click **Continue**.
9. In the **Tank Status** and **Cap Status** fields, select the status of each using the dropdown arrow.

Tank Status:	**Cap Status:**
Connected	Connected
Disconnected	Missing
Damaged	Damaged
Inaccessible	
Missing	

10. Click **Continue** and the **Tank Pressure Test** will begin. After stabilizing, the **Cap Pressure Test** will begin, and the two tests will run simultaneously through completion. Proceed to the next section: **Tank Pressure Test.**

    NOTE: To test **Cap Only** or **Tank Only**, proceed to the **Tank Pressure Test** or **Cap Pressure Test** sections.

Tank Pressure Test

1. Wait while the tank is pressurized.

   NOTE: If unable to pressurize the tank properly, ensure that the fuel tank line is properly clamped at the canister and that the tank pressure tester is properly connected. Click **Retry** to repeat this step.

2. Wait as the stabilizing tank countdown is performed.
3. The **Testing Tank** window prompts you to: **Please wait**.
4. The Tank drains in the final step of the Tank Pressure Test.
5. If only the Tank Pressure Test is being performed, proceed to **Step 3** in the next section: **Cap Pressure Test** for Tank Results.
6. Proceed to the next section: **Cap Pressure Test**.

Cap Pressure Test

1. Wait while the fuel cap is pressurized.

   NOTE: If unable to pressurize the cap properly, ensure that the fuel cap is properly connected to the Cap Tester. Click **Retry** to repeat this step.

2. Wait while the fuel cap is tested.

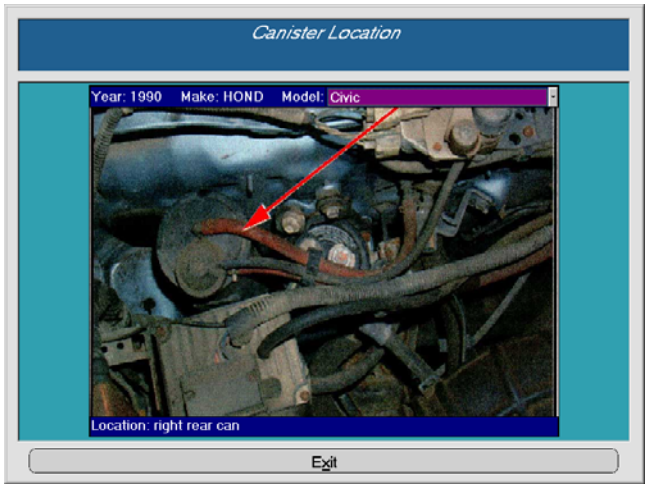
   NOTE: To discontinue the test, click **Stop Test**. Cap and/or Tank results will indicate Fail.

3. When the Pressure Test is complete, remove all clamps and adapters. Results will display as Pass, Fail, or Not Applicable.
   a. If the Cap or Tank Result is **Fail**, you can click **Retest Cap, Retest Tank, or Restart** (for both), to run the tests again.
   b. If you click **Stop Test** at anytime during the testing process, it will discontinue the test and the test results will indicate the test Failed.
4. At the prompt: **Please remove all clamps and adapters**, close the hood of the vehicle.
5. Replace the fuel cap.
6. Click **OK**. The **SubTest Menu** opens.
7. Proceed to the **Final Test Results** section in this chapter.

Canister Location

To locate the canister for the vehicle under test:

When prompted to clamp the fuel tank line at the canister during the Pressure Test	Click **Locate**	The **Canister Location** window opens The year and make of the vehicle will be shown in the Canister Location window. Information about the vehicle's purge canister is based on the model year, the make and the model of the vehicle.
To view the canister location for the vehicle	Click the dropdown arrow	Select the vehicle model for the VUT. A picture of the canister will display. The location will be identified with an arrow, as well as by a written description. (See the example below.)
After identifying the canister location	Click **Exit**	The system will return to the start of the **Pressure** window.



FINAL TEST RESULTS – POSITION 2

The Test Results from Position 1 and Position 2 are displayed in the Test Results window. The Test Results window has three columns: **Test Type**, **Result**, and **Result Details**.

To view the results for each test:

1. From the **Test Results** window, in the Result Details column, click **Details** for the Test Type category you want to view. The window will display the results for that particular test.
2. When you are finished viewing a test result, click **Continue** to return to the main **Test Results** window.
3. To view another test result, follow **Step 1 and 2** above.
4. When you have finished viewing the test results, from the main **Test Results** window, click **Continue**. The **Print VIR** window opens.

PRINTING THE VEHICLE INSPECTION REPORT (VIR)

After reviewing the test results data, you will print a Vehicle Inspection Report.

Printing a VIR

1. From the **Print VIR** window, click **Print**.
2. The **Was Printing Successful** dialog box opens. Click **Yes**.

   NOTE: If no response, the screen will time out after 60 seconds.
3. Refer to the **Waiting For The Next Vehicle** section in this chapter.

Reprinting a VIR

1. If printing the document was not successful, click **No**.
2. The **Print VIR – Reprint** window opens.
3. Click **Reprint** to print a copy of the VIR.
4. The following message will display: **Was Reprinting Successful?**
5. If the document printed successfully, click **Yes**.
6. If the document did **NOT** print successfully, click **No**. Fix the problem and reprint the document again.

Reissuing a VIR

1. From the **Main Menu** window, click **Reissue**.
2. The **Reissue Menu** opens. Click **Reissue VIR**.
3. The **Reissue VIR – Vehicle Lookup** window opens. Enter the **VIN** or **License Plate**.
4. Click **OK**. The **Reprint VIR – Select Test** window opens.
5. Highlight the test to be reprinted. Click **OK**.
6. The **Reissue VIR – Print** window opens. Click **Print**.
7. The report prints. Click **Previous** to return to the **Main Menu**.

   NOTE: **REISSUE** will be printed on the upper left corner of the VIR (see the example on the next page).

Vehicle Inspection Record

STATE OF DELAWARE
VEHICLE INSPECTION REPORT

Customers must provide this report to title or registration clerk when titling your vehicle or renewing the vehicle registration. **THIS INSPECTION IS VALID FOR 90 DAYS**. In the event your registration has expired or you are driving an unregistered vehicle, one temporary tag or a temporary permit may be obtained at the Registration section of each DMV facility so your vehicle can be legally moved on Delaware roadways.

REISSUE

OVERALL RESULT
FAIL

NUMBER
2003120414273690829

INDIVIDUAL TEST RESULTS

EMISSIONS	OBD II	CAP	TANK	ECS	SAFETY	BRAKES	MISC FAILURE
	FAIL				PASS	PASS	

VEHICLE INFORMATION

VEHICLE VIN	LICENSE PLATE	SPECIAL PLATE	YEAR	MAKE	MODEL	BODY STYLE	ODOMETER
11111	DEL123		2003	ACUR	C16	2dr	11111

MGVWR	REGISTRATION WEIGHT	TRACTOR TRAILER	AXLES	TYPE OF FUEL	TYPE OF TEST
5000		N	2	GASOLINE	OBD II TEST

GENERAL INFORMATION

INITIAL TEST DATE	INSPECTION STATION	LANE	TEST NO.	TECH ID(1)	TECH ID(2)	DATE	TIME
12/04/2003	Tucson test	29	1	A1	A1	12/04/2003	14:27:36

EMISSIONS INSPECTION INFORMATION – OBD II

DLC TAMPER	KOEO	KOER	COMM. RESULT	MIL COMMAND STATUS	READINESS STATUS
PASS	PASS	PASS	FAIL		

OBD II DETAILS

DIAGNOSTIC TROUBLE CODES				READINESS MONITOR STATUS			
1		7		Misfire		2nd Air Sys	
2		8		Fuel Sys		AC Sys	
3		9		Component		O2 Sensor	
4		10		Catalyst		O2 Sensor Heater	
5		11		Heated Catalyst		EGR Sys	
6		12		Evap Sys			

ECS INSPECTION INFORMATION

CAT. CONV.	
HOSE/CANISTER	
FUEL CAP	

SAFETY INSPECTION FAILURE ITEMS

1	5
2	6
3	7
4	8

MISCELLANEOUS FAILURE ITEMS

DMV FORM #210 DOC # 45-07-01-10-1 WARNING – THIS DOCUMENT IS COPY PROTECTED V:1CCD R:7CA5 INTERNAL # 0110

ABORTING AN INSPECTION

When a test needs to be aborted for any reason, click **Abort**.

The **Are you sure you want to abort now?** window opens to confirm that the test is to be aborted. Click the dropdown arrow to highlight the abort reason, and then click **Yes** to abort the inspection.

The **Test Result** window will display the test as **ABORT**.

Aborting a test will not print a VIR.

TRANSMITTING TEST INFORMATION

After you have verified that a valid VIR was printed, the system automatically transmits the test record to the Station Manager PC and on to the Delaware Mainframe. A duplicate test record will be stored locally for 90 days to prevent data loss.

WAITING FOR THE NEXT VEHICLE

Once the VIR has printed, testing is completed at Position 2.

If another vehicle is waiting to be tested, the **Next Vehicle Available for Testing on Position 2** window opens.

If no other vehicle is waiting to be tested, the **No Vehicles Available for Testing on Position 2** window opens and displays the following message: **WAIT FOR THE NEXT VEHICLE**.

Chapter 6 Additional Main Menu Options

OVERVIEW

This section will discuss additional submenus that are available from the Main Menu

The Main Menu options include:

- Standby
- Test Vehicle
- Daily
- Utilities
- Reissue
- Maintenance
- Quality Assurance

STANDBY

Standby is automatically entered after initializing the inspection lane software. When Standby is selected from the Main Menu, the system logs off the current user and restricts functional access until another valid user logs on. After a valid user logs on, the system will provide access to the Main Menu.

TEST VEHICLE

For Position 1, refer to Chapter 4, **Inspecting a Vehicle – Position 1**, under the **Entering Vehicle Criteria** section.

For Position 2, if another vehicle is waiting to be tested, the **Next Vehicle Available for Testing on Position 2** window opens. If no other vehicle is waiting to be tested, the **No Vehicles Available for Testing on Position 2** window opens and displays the following message: **WAIT FOR THE NEXT VEHICLE**.

DAILY

Daily is selected during Start Up and Shutdown. Refer to **Chapter 3, Daily Start Up** for procedures on how to Start Up and Shutdown the system.

UTILITIES

During the normal course of station operations and for normal software testing and engineering purposes, access to functionality other than Test Vehicle may be required.

NOTE: Different Utilities Menu options are available to different inspector levels.

The Utilities Menu allows access to the following at Position 1:

- Exit to Windows
- Modify Host Communications
- Change Date and Time
- Local Data Record Access
- Retransmit Data
- Modes of Operation

The Utilities Menu allows access to the following at Position 1:

- Change Date and Time
- Local Data Record Access
- Retransmit Data
- Modes of Operation

Exit to Windows

This menu option is available to FSRs and ESP Engineers only.

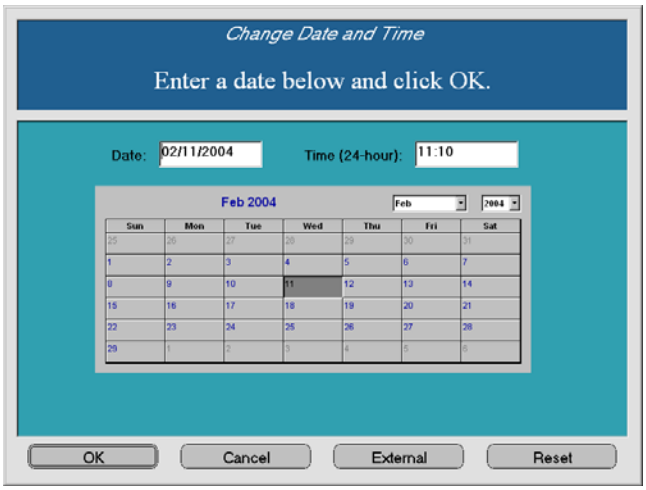
Modify Host Communications

This menu option is available to Station Managers and ESP Engineers only.

Change Date and Time

You can select Change Date and Time from the Utilities Menu at Position 1, Position 2, or from the Station Manager PC. You can manually configure both date and time.

1. From the **Change Date and Time** window, select a date on the calendar, and that date will automatically display in the **Date** field.
2. To change the time, enter the hour and minutes in the **Time (24-hour)** field and click **OK**.



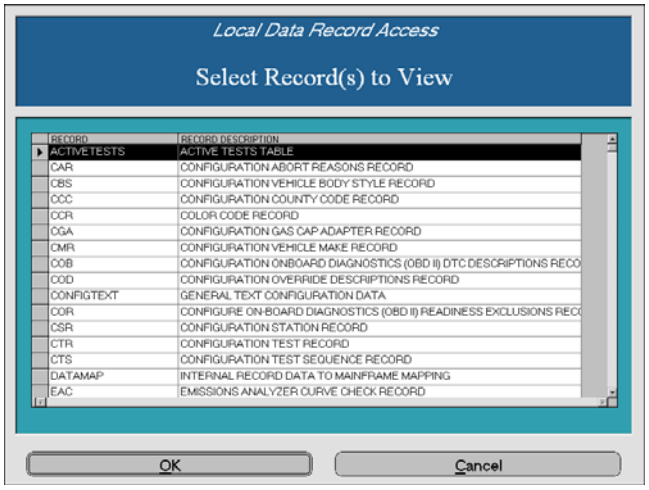
3. The **Confirm Change of Date and Time** window opens. Click **OK** to accept the new date and time.

   NOTE: Click Cancel to return to the Utilities Menu. Clicking External requests the date and time from an external source over the communications network, the Confirm Change of Date and Time window opens. Click Reset to return the date and time to the original settings.

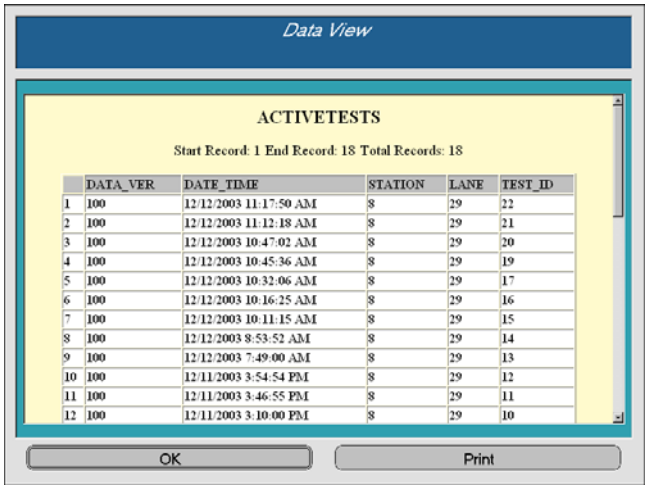
Local Data Record Access

Local Data Record Access allows a read-only access view of the tables contained in the Access Database. You can select Local Data Record Access from the Utilities Menu at Position 1, Position 2, or from the Station Manager PC.

1. From the **Local Data Record Access** window, select the record(s) you want to view. Click **OK**.



2. The **Data View** window opens as shown below. Click **Print** to get a printout of the selected record.



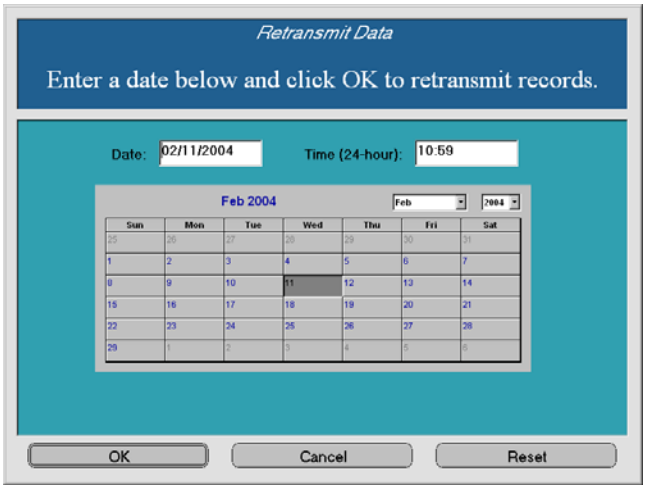
3. The **Print window** opens and displays the following message: **Printing Completed**. The record has successfully printed. Click **OK**.
4. The **Local Data Record Access** window opens to view and/or print another record.

   NOTE: Click Cancel to return to the Utilities Menu.

Retransmit Data

The Retransmit Data option is available from the Utilities Menu at Position 1, Position 2, and the Station Manager PC. The Retransmit Data option will search the Position 1 PC for records that failed to transmit to the Station Manager PC, or for records that were transmitted, but the acknowledgement of the transmission was never received. You can then retransmit those records.

1. From the **Retransmit Data** window, select a date from the calendar.



2. Click **OK** to transmit records for that day.

   NOTE: Click Cancel to return to the Utilities Menu. Click Reset to return to the original settings.

3. Once you click OK, the records are retransmitted and the **Utilities Menu** opens.

Modes of Operation

The Modes of Operation Menu at Position 1 includes:

- Training Mode
- Normal Mode
- Engineering Mode
- Simulation

The Modes of Operation Menu at Position 2 includes:

- Training Mode
- Normal Mode

Training Mode

If Training Mode is selected, all newly created VTR records will be marked as Training. This function is available only to the Chief Inspector or higher.

1. From the **Training Mode** window, click **Continue**.
2. The **Restart** window opens. Click **Continue**.

   NOTE: In order for Training Mode to be functional, it is necessary to restart the system.
3. When the system has restarted, the **Vehicle Inspection and Maintenance Program** window displays **Training** in the upper left-hand corner.

   To return to Normal Mode testing, perform the procedures that follow in the next section, **Normal Mode**.

Normal Mode

Normal Mode returns the program to Normal Mode and is available to the Chief Inspector or higher.

1. From the **Normal Mode** window, click **Continue**.
2. The **Restart** window opens. Click **Continue**.

   NOTE: In order for Normal Mode to be functional, it is necessary to restart the system.
3. When the system has restarted, the **Vehicle Inspection and Maintenance Program** window opens.
4. Logon to the system by entering your **Inspector ID** and **Password** in the corresponding fields.

Engineering Mode

This mode is for ESP Engineers.

Simulation Mode

This mode is for ESP Engineers.

REISSUE

The Reissue Menu allows a reprint of the Vehicle Inspection Report (VIR).

For information on how to reissue another VIR, refer to **Chapter 5, Inspecting a Vehicle – Position 2**.

MAINTENANCE

The Maintenance Menu provides access to a variety of functions needed to ensure proper operation of the Vehicle Inspection.

The Maintenance Menu at Position 1 includes the following submenus:

- Record Maintenance Activity
- Troubleshoot

The Maintenance Menu at Position 2 includes the following submenus:

- Configure Network
- Record Maintenance Activity
- Troubleshoot

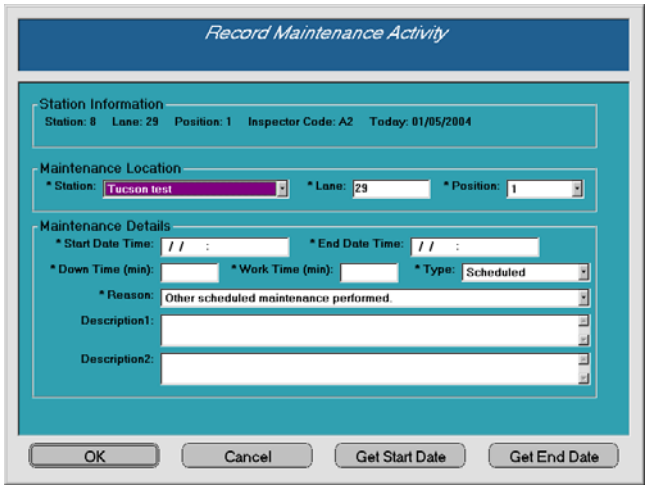
Configure Network

The Configure Network menu allows you to configure the Network. It allows you to select the station location, lane number, and the current network settings.

Record Maintenance Activity

The Record Maintenance Activity window is used for logging down time for scheduled and unscheduled lane maintenance.

1. From the **Maintenance Menu**, click **Record Maintenance Activity**.
2. The **Record Maintenance Activity** window opens. The window consists of the following three areas:
    - Station Information
    - Maintenance Location
    - Maintenance Details



3. Click **Get Start Date**. The **Get Start Date** window opens.
4. Select the date and time to begin start of maintenance activity and click **OK**. The **Record Maintenance Activity** window opens and the date and time selected is automatically entered in the **Start Date and Time** field.
5. Click **Get End Date**. The **Get End Date** window opens.
6. Select the date and time to end the maintenance activity and click **OK**. The **Record Maintenance Activity** window opens and the date and time selected is automatically entered in the **End Date and Time** field.

    NOTE: Start Date Time and End Date Time are required fields. After clicking OK to proceed, if this information is not automatically entered, the Invalid Value Entered window opens and prompts you to enter this information. Click OK to enter the missing required information.

7. Enter the **Down Time** and **Work Time** in minutes in the appropriate fields.

NOTE: Down Time and Work Time are required fields. If you fail to enter this information, the Invalid Value Entered window opens and prompts you to enter this information. Click OK to enter the missing required information.

8. Enter the Type of maintenance by clicking the dropdown arrow and selecting **Scheduled** or **Unscheduled** from the list.

9. Enter the **Reason** by clicking the dropdown arrow and selecting the appropriate reason from the list.

10. Type in any further information in the **Description 1** and **Description 2** fields.

Troubleshoot

The Troubleshoot Menu provides a wide variety of equipment information to keep the lane in proper operating condition.

The Troubleshoot Menu includes the following options:

- Remote Control
- Emissions
- OBD II
- Cap/Tank Pressure Tester
- RPM

NOTE: The Cap/Tank Pressure Tester is on Position 2 and the others are on Position 1.

Remote Control

From the **Troubleshoot Menu** window, click **Remote Control.** The **Remote Control** diagram displays.

You can troubleshoot any Remote Control function problems by selecting one of the following options available on the Remote Control diagram:

- Up
- Left
- Right
- Down
- Enter
- N/A
- Pass
- Fail

Click **Exit** to return to the **Troubleshoot Menu** window.

Emissions

The Emissions window provides a real time display of gases; pressure inputs; analyzer mode, pumps, and solenoid status. It also displays the model and serial number of the analyzer.

From the **Troubleshoot Menu** window, click **Emissions**. The **Bench Console** window displays. This option is used to facilitate troubleshooting emissions problems.

The Bench Console window contains the following areas:

- Gas Readings
- Modes
- The following three tabs:
    - Status
    - Properties
    - Misc
- Sample Vacuum
- Primary Status
- Customer Monitor
- Bench Vendor ID
- Bench Serial Number

Gas Readings

The Gas Readings area displays:

- HC (ppm)
- CO (%)
- CO_2 (%)

Modes

The Modes area is used to select the mode to be used in diagnosing any problems with the bench. Highlight the desired mode and click **Set Mode**. Once you click **Set Mode**, that mode is displayed in the **Current Mode** field.

Status Tab

Green (thumb up) = Pass

Red (thumb down) = Fail

NOTE: Click Refresh to return the status fields to their original setting.

Properties Tab

Click the Properties Tab to display property settings such as:

- Cell Temperature
- Cell Pressure
- Vendor
- Serial Number

Misc Tab

The Misc Tab displays:

- Zero Calibration button
- High Calibration button
- Bench Info:
    - PEF field
    - Cell Pressure (millibars) field
    - Cell Temperature (F) field

Sample Vacuum

The Sample Vacuum field displays the field in inches. The Sample Gas Flow Pressure displays when the **Low Flow** checkbox is selected and the Sample Gas Flow Pressure is applied.

Primary Status

The Primary Status box indicates the status of the bench as:

- Warmup
- Calibrating
- Cal. Low Flow
- Zero Cal. Req.
- Ready

Customer Monitor

Turning the Customer Monitor ON will display the S4 Customer field as activated. Turning the Customer Monitor OFF will deactivate the S4 Customer and remove the check.

Bench Vendor ID

Vendor identification for the Bench is displayed in this field.

Bench Serial Number

The Serial Number for the Bench is displayed in this field.

OBD II Menu

From the **Troubleshoot Menu** window, click **OBD II**. The **OBD II Troubleshooter** window displays. This menu is used to diagnose OBD II problems.

In the following table, the **FUNCTION** column contains the buttons displayed in the **OBD II Troubleshooter** window; the **STATUS** column contains the information that will display in the **Status** field when you click the corresponding button; the **RPM** column contains the information that will display in the **RPM** field when you click the corresponding button:

FUNCTION	STATUS	RPM
Reset	RESET_OBD	
Connect To Vehicle	CONNECT	
Readiness Status	READINESS_STATUS-FAIL	
DTC Codes	READ_DTC	
RPM On		0
RPM Off		
Disconnect To Vehicle	DISCONNECT	

Cap/Tank Pressure Tester

The Cap/Tank Pressure Tester menu provides access to the Pressure Console window to change the Current Mode, Cap Pressure, Tank Pressure, and the Solenoid settings.

RPM

From the Troubleshoot Menu window, click RPM. The Tachometer Console window displays. This window is used to diagnose the RPM probes.

QUALITY ASSURANCE

This access is allowed for all calibrations and maintenance functions.

For instructions on how to perform the required calibrations, refer to **Chapter 7, Maintenance and Troubleshooting**.

Chapter 7 Maintenance and Troubleshooting

MAINTENANCE

Regular preventive maintenance avoids excessive analyzer downtime. Please set a schedule for timely maintenance of all items requiring attention.

NOTE: The internal components of the unit (locked areas) must be serviced by ESP personnel only.

Cabinet and Air Filter

External Cabinet

Frequency = As needed

CAUTION: Do **NOT** allow water to get inside the unit or any of its components (such as the keyboard or the printer). Do **NOT** use any cleaning solvents on the analyzer.

1. Turn the analyzer off.
2. Using a soft cloth, wipe the cabinet surfaces with a mild soap and water solution.
3. Wipe the monitor with a lint free cloth slightly dampened with water or window cleaning solution (such as Windex). Do NOT use strong cleansers or abrasives.
4. Turn the analyzer back on. Allow it to warm up for 30 minutes before you begin an emissions test.

Cabinet Air Filter

Frequency = Weekly

CAUTION: Do NOT blow the filter out with compressed air, as damage to the inside of the filter will result.

1. Remove the filters from the rear door.
2. Clean the filter with warm soapy water. It must be completely dry before it is reinstalled.

Sample Hose and Exhaust Probe

CAUTION: NEVER allow air to be blown into the analyzer. Make sure that no one is near the end of the hose or probe. Flying debris can cause an injury.

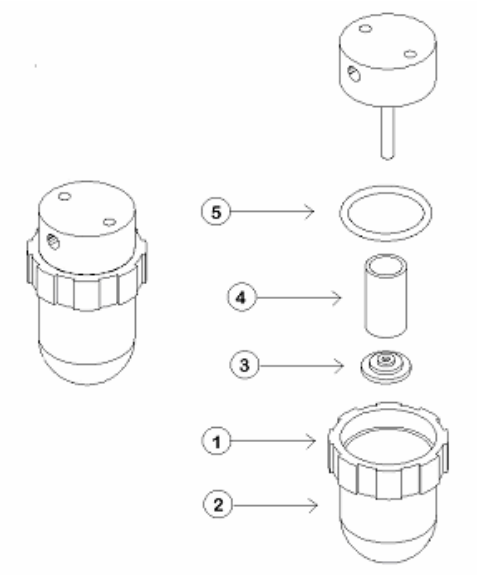
1. Remove the exhaust probe from the end of the hose, using the proper tools.
2. Remove the hose from the side of the unit. Use a wrench to hold the stainless steel elbow on the unit.
3. Using compressed air that is regulated to no more than 60 psi, blow through the hose from the analyzer end out. Also, blow through the probe from the threaded fitting end out. This will dislodge any foreign matter that may have accumulated inside the probe or hose. NEVER use cleaning solvents.
4. Reattach the hose and exhaust probe.

Filters

Sample System Filters

Frequency = Weekly or whenever a Low Flow is displayed

There are four sample system filters on the SystemOne™. Two of these are serviceable, while the other two (the in-line filters) are disposable. The filter element in the serviceable filters should be replaced weekly, and the disposable filters should be replaced on the same schedule. This may vary, however, according to the number of vehicles that are tested. The best way to ensure the integrity of the filters is to regularly remove and visually inspect them for dirt and damage.



The call-out numbers in the above illustration are referred to in the instructional steps that follow.

Replacing the Filter Element in a Serviceable Filter

To remove and replace the filter element in a serviceable filter:

1. Unscrew the filter bowl ring (1) located at the top of the filter.
2. Remove the clear plastic filter bowl (2).
3. Unscrew the black plastic filter retainer (3).
4. Throw out the used filter element (4).
5. Install the new filter element.
6. Screw on the black plastic filter retainer (3).

7. Verify that the filter bowl 0-ring (5) is clean and properly seated, then replace the filter bowl.
8. Screw on the filter bowl ring (1).
9. Repeat the process for the second filter.

Replacing a Disposable In-line Filter

1. Make a mental note of the flow arrow direction labeled on the filter.
2. Remove both tubes from the old filter, being careful not to let any tubes slide back into the analyzer.
3. Connect the two tubes to the new filter, with the flow arrow pointing as in Step 1.
4. Repeat the process for the second in-line filter.
5. Verify that the flow arrows on both filters point in the correct direction.

Gas Bottles

The analyzer is required to complete a calibration and leak check in accordance with Delaware regulations. The calibration gas bottles are on board the SystemOne™ located behind the bottom doors in the front of the analyzer. A Zero Air bottle is located either on board the SystemOneTM or in the testing facility and connected by a hose to the analyzer. Always ensure that the gas you purchase has gas values within the ranges set for the analyzer.

To prevent a shortage of gas, keep an extra set of gas bottles on hand so that you will not be locked out of the vehicle test while you are waiting for gas delivery.

Installing a Gas Bottle

Frequency: As needed

To avoid confusing gas bottles and reversing hook-up, it is strongly recommended that only one bottle be changed at a time.

1. Open the bottom front door of the analyzer.
2. Ensure that the gas bottle valve is in the **Off** position.
3. Remove the strap holding the gas bottle on the rack.
4. Loosen the nut connected to the gas bottle's valve.
5. Remove the calibration gas line from the bottle.
6. Remove the old gas bottle. Ensure that the gas mixture label on the empty bottle matches the gas mixture label on the new bottle.
7. Install the new bottle by attaching the calibration gas line and tightening the nut on the bottle's valve. Position the bottle on the rack and strap it in.
8. Be sure to match the correct bottle with the correct calibration gas line. Failure to ensure that this step is done correctly will cause the analyzer to fail calibration.

TROUBLESHOOTING

Gas Analyzer Calibration Fails

First, verify correct calibration and zero-gas is being used. Verify correct gas bottle values have been entered when prompted. Get these values directly off the bottle label, as blends vary slightly from bottle to bottle. Verify that each tank has at least 30 psi available. Make sure both valves are open to allow adequate flow.

If the machine continues to fail Calibration after several attempts, call the Service.

Gas Analyzer Leak Check Fails

Make sure that all fittings are tight and the filter bowl O-rings are present and seated. Moistening the O-rings can help resolve a leak if they are dry.

HC Hang-up

An HC Hang-up will occur when there is a high variance between the hydrocarbon (HC) level measured through the probe and the zero-gas sample.

The most common causes of a lengthy HC Hang-up are:

1. Probing the vehicle under test too early.
2. Placing the analyzer in an HC rich environment (i.e. near a gasoline spill or petroleum based cleaning solvents).

Another cause of HC Hang-up is a dirty or saturated filter system. The moisture and particulate trapped in the filters can contain high levels of HC. Excessive moisture in the filter bowl can also contribute to HC Hang-up. Dump out this moisture and wipe the bowl dry with a clean, dry towel.

Keyboard/Monitor

If either component fails to operate, check the connections at the junction located on the top-rear of the cabinet. Make sure the green power indicator is illuminated on front of the monitor. Yellow indicates no VGA signal, green indicates video is good and no illumination indicates there is no power.

Low Flow

A **Low Flow** message indicates an insufficient quantity of exhaust sample is reaching the bench. It can be caused by an obstructed sample hose, probe tip, filters or an internal analyzer problem.

To help you verify which of these items is obstructed, install the Dual Exhaust Hose. If the Low Flow message disappears, the obstruction is in the 8' hose or the probe tip. If the problem persists, remove the hose from the filter housing. If the **Low Flow** message disappears, the problem is in the 17' hose or tee fitting. Blow out the hoses with compressed air.

WARNING: Do **NOT** use solvents to clean the hoses. Solvents can cause rapid deterioration of the hoses and can saturate the hoses with high amounts of HC.

If the **Low Flow** message persists after removing the filter hose, replace both the Sample and In-Line filters.

If the **Low Flow** message still appears, call Service.

Printer

If the **Printer Off-line** message is displayed, first make sure that the paper is properly loaded. Cycling the printer's power switch can clear the message after the paper has been properly loaded.

Sample Dilution

A sample dilution can occur when the CO and CO_2 concentration of the sample is diluted. It can be caused by a leak in the sample system or a leak in the vehicle's exhaust system or other reasons.

To verify the integrity of the sample system, perform a Leak Check. If the analyzer passes the Leak Check, the problem is external to the Sample System.

If you cannot find the leak by using the Leak Check procedures, call Service.

CALIBRATIONS

There are various calibration tests that must be performed and passed before testing can begin to ensure accurate test results.

Calibration Schedule

Calibration	Position	Frequency
Two-Point Gas Calibration	1	Daily
Sample System Leak Check	1	Daily
Gas Cap Calibration	2	Daily
Cap Pressure Leak Check	2	Daily
Tank Pressure Leak Check	2	Daily

How to perform each calibration will be described in this section.

Calibrations – Position 1

To perform the calibrations at Position 1:

1. From the **Main Menu** window **(at Position 1)** , click **Quality Assurance.**
2. The **Quality Assurance Menu** opens. Click **Emissions**. The Emissions Menu opens.
3. The Emissions Menu options are:
    - Two Point Gas Calibration
    - Sample System Leak Check

Two Point Gas Calibration

Equipment Required: Calibration Gas

1. From the **Emissions Menu**, click **Two Point Gas Calibration**. The **Prepare for Calibration** window opens.
2. Follow the instructions on the window. Click **OK** to continue. The **Bench Calibration** window opens.
3. The Bench Calibration window displays a series of messages. Wait for the testing process to complete.
4. When the test is completed, the window will display the following message: **Calibration Complete**, and will indicate whether the test Passed or Failed.
    a. If the test Passed, turn the calibration gas off and click **OK**. The **Emissions Menu** opens.
    b. If the test Failed, repeat the **Two Point Gas Calibration**, paying attention to the error message indicating the reason for calibration failure. Resolve the reasons for calibration failure. Repeat Two Point Calibration. When the test is completed and Passed, click **OK**. The **Emissions Menu** opens.

Sample System Leak Check

Equipment Required: Probe Cap

1. From the **Emissions Menu**, click **Sample System Leak Check**.
2. The **Prepare for Leak Check** window opens. Follow the instructions on the window. Click **OK** to continue. The **Sample System Leak Check** window opens.
3. The **Sample System Leak Check** window displays a series of messages. Wait for the testing process to complete.
4. When the test is completed, the **Leak Check Results** window opens, and indicates whether the test Passed or Failed.
    a. If the test Passed, remove cap from probe and click **OK.** The **Emissions Menu** opens.
    b. If the test Failed, repeat the **Sample System Leak Check**, paying attention to the error message indicating the reason for the failure. Resolve the reasons for calibration failure. Repeat Sample Leak Check. When the test is completed and Passed, click **OK**. The **Emissions Menu** opens.

Aborting a Calibration / Leak Check

1. If the calibration or leak check needs to be aborted for any reason, click **Abort**.
2. The **Are you sure you want to abort now?** window opens. Click **Yes**.
3. For the **Bench Calibration**: The **Bench Calibration** window indicates the test was **Aborted**. Turn the calibration gas **OFF** and click **OK.** The **Emissions Menu** opens
4. For the **Leak Check**: The **Leak Check Results** window indicates the test was **Aborted**. Remove the cap from the probe and click **OK**. The **Emissions Menu** opens.

Calibrations – Position 2

To perform the calibrations at Position 2:

1. From the **Main Menu (at Position 2)** window, click **Quality Assurance**.
2. The **Quality Assurance Menu** window opens. Click **Pressure**. The **Pressure Menu** window opens.

   NOTE: From the **Quality Assurance Menu** window, you can also click **All Q/A**. The **Pressure Equipment** window opens. In the **Perform** column, click the checkbox for the test you want to perform. Click **OK**. The appropriate test window opens.
3. The Pressure Menu window options include:
   - Gas Cap Calibration
   - Cap Pressure Leak Check
   - Cap Gauge Calibration
   - Tank Pressure Leak Check
   - Tank Gauge Calibration

Gas Cap Calibration

Equipment Required: From the Gas Cap Adapter Set Master Calibration Caps: known Pass Cap and known Fail Cap

1. From the **Pressure Menu**, click **Gas Cap Calibration**. The **Gas Cap Calibration** window opens.
2. The **Gas Cap Calibration** window displays a series of messages. Follow the instructions on each window and click **OK** when required to proceed with the test.
3. Wait for the testing process to complete.
4. When the test is completed, the window will state the following message: **Disconnect The Standard FAIL Cap**. Follow the instructions and click **OK**.
5. The window will indicate whether the test Passed (the cap pressure loss is within the tolerance limit) or Failed (unable to pressurize cap properly).
   a. If the test **Passed**, click **OK**. The **Pressure Menu** opens.
   b. If the test **Failed**, disconnect the cap from the end of the hose and repeat the test, paying attention to the error message indicating the reason for the failure. Resolve the reasons for calibration failure. Repeat the calibration. When the test is completed and **Passed**, click **OK**. The **Pressure Menu** opens.

Cap Pressure Leak Check

Equipment Required: Manometer

1. From the **Pressure Menu**, click **Cap Pressure Leak Check**. The **Cap Pressure Leak Check** window opens.
2. The **Cap Pressure Leak Check** window displays a series of messages. Follow the instructions on each window and click **OK** when required to proceed with the test.
3. Wait for the testing process to complete.
4. When the test is completed, the window will indicate whether the test Passed or Failed.
    a. If the test **Passed**, disconnect the leak check device and click **OK**. The **Pressure Menu** opens.
    b. If the test **Failed** due to invalid initial pressure, a **Pressure Gauge Calibration** is required. Disconnect the leak check device and click **OK**. The **Pressure Menu** opens.
5. Proceed to the next section, **Cap Gauge Calibration**.

Cap Gauge Calibration

Equipment Required: Manometer

1. From the **Pressure Menu**, click **Cap Gauge Calibration**. The **Cap Pressure Gauge Calibration** window opens.
2. The **Cap Pressure Gauge Calibration** window displays a series of messages. Follow the instructions on each window and click **OK** when required to proceed with the test.
3. Wait for the testing process to complete.
4. When the test is completed, the window will indicate whether the test Passed or Failed.
    a. If the test **Passed**, click **OK**. The **Pressure Menu** opens.
    b. If the test **Failed**, resolve any issues and repeat the test. When the test is completed and Passed, click **OK**. The **Pressure Menu** opens.

Tank Pressure Leak Check

1. From the **Pressure Menu**, click **Tank Pressure Leak Check**. The **Tank Pressure Leak Check** window opens.
2. The **Tank Pressure Leak Check** window displays a series of messages. Follow the instructions on each window and click **OK** when required to proceed with the test.
3. Wait for the testing process to complete.
4. When the test is completed, the window will indicate whether the test Passed or Failed.
    a. If the test **Passed**, disconnect the Leak Check devices and click **OK**. The **Pressure Menu** opens.
    b. If the test **Failed** due to invalid pressure, a **Tank Gauge Calibration** is required. The Technician Access or higher will perform this test. Click **OK**. The **Pressure Menu** opens.

Tank Pressure Gauge Calibration

Equipment Required: Manometer

1. From the **Pressure Menu** window, click **Tank Gauge Calibration**. The **Tank Pressure Gauge Calibration** window opens.
2. The **Tank Pressure Gauge Calibration** window displays a series of messages. Follow the instructions on each window and click **OK** when required to proceed with the test.
3. Wait for the testing process to complete.
4. When the test is completed, the window will indicate whether the test Passed or Failed.
    a. If the test **Passed**, click **OK**. The **Pressure Menu** window opens.
    b. If the test **Failed**, resolve any issues and repeat the calibration. When the test is completed and **Passed**, click **OK**. The **Pressure Menu** window opens.

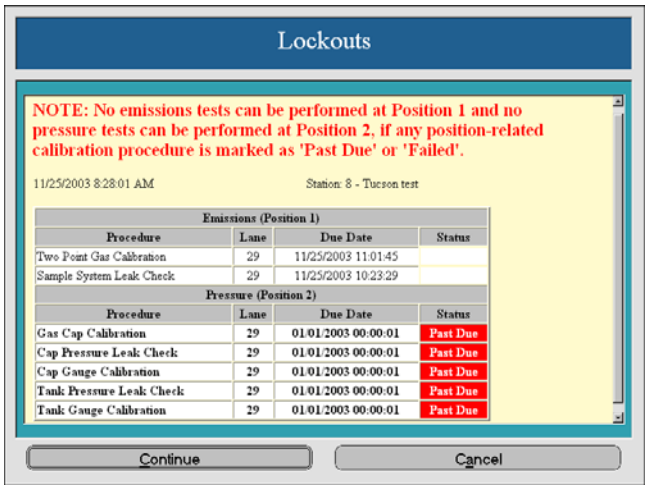
Aborting Pressure Tests

1. If any of the Pressure tests need to be aborted for any reason, click **Abort**
2. The **Are you sure you want to abort now?** window opens.
3. Click **Yes** to abort the test and return to the **Pressure Menu**.

LOCKOUT FUNCTIONS

No emissions tests can be performed at Position 1 and no pressure tests can be performed at Position 2 if any position related calibration procedure is marked Past Due or Failed.

An example of the Lockouts window is shown below:



Determine the reason for the lockout and perform the procedure to remove the lockout. If the calibration passes, the lockout will automatically be removed.

Some of the situations that will initiate a lockout:

Position 1

The following calibrations are **Past Due**:

- Two Point Gas Calibration
- Sample System Leak Check

Click **Continue** to proceed.

Click **Cancel** to return to the **Main Menu**.

Position 2

The following calibrations are **Past Due**:

- Gas Cap Calibration
- Cap Pressure Leak Check
- Cap Gauge Calibration
- Tank Pressure Leak Check
- Tank Gauge Calibration

Click **Continue** to proceed.

Click **Cancel** to return to the **Main Menu**.

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Appendix A Station Manager Functions

OVERVIEW

The Station Manager PC functions as a tool to assist the Station Manager's daily operations. The Station Manager PC communicates with the DE Mainframe in real time. It also transmits completed vehicle inspections and maintenance records from its combined station database to the DE Mainframe.

NOTE: Although the same software is loaded on both the Station Manager PC and the lane PCs, only certain options are available on the Main Menu at the Station Manager PC.

DAILY

Daily is selected during Start Up and Shutdown. Refer to **Chapter 3, Daily Start Up** for instructions on how to Start Up and Shutdown the system.

The Daily Menu provides the following options:

- Startup
- Shutdown

Startup

The startup process is run to prepare the system for normal daily operations.

1. After you logon to the system, the **Startup Messages** window opens.
2. Wait to view all messages, then click **OK** when it is available (button turns from red to black) or wait 15 seconds and the **Main Menu** opens.

Shutdown

This process allows the Station Manager to shutdown the system from normal daily operation.

1. From the **Daily Menu**, click **Shutdown**.
2. The **Current Record Transmission Status** window opens. Click **Continue**.

REPORTS

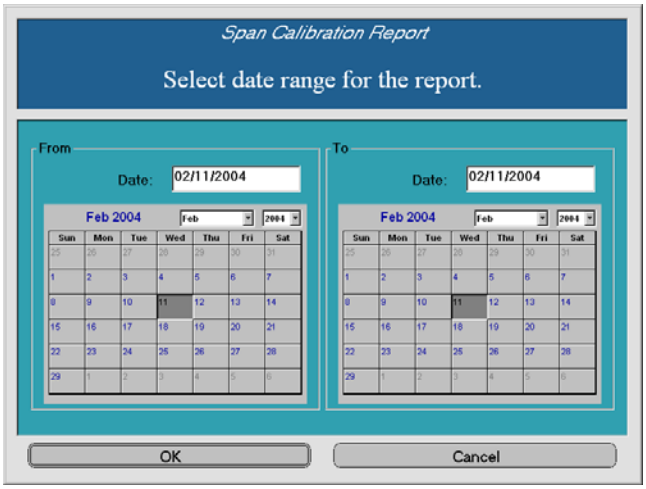
The Station Manager will have the ability to generate reports for each lane. These reports can be generated for specific days from the current day up to and including the 90 day limit on the duplicate stored data.

1. From the **Main Menu**, click **Reports**.
2. The **Reports Menu** opens and includes the following options:
    a. Calibration Reports
    b. Performance Reports
    c. Vehicle Report
    d. Summary Test Report
    e. Technician Report
    f. OBD II Report
    g. OBD II MIL Report
    h. Lane Status Report

    NOTE: Each of the above options, when selected, displays a submenu of reports for that category. In the instructions that follow, the above options are referred to as the main report window for each report in that category.

Follow this standard procedure to generate each report:

1. From the main report window, click a report you want to generate.
2. When the report window opens, select the date range for the report (see the example below). Click **OK**.



3. The report displays for the range selected at the previous window (see an example of each report in the following sections). Click **OK** to return to the previous window or click **Print** to print the report.
4. Once the report is printed, the **Print** window opens and displays the following message: **Printing Completed**. Click **OK**.
5. The report window opens. Click **OK**. The main report window opens.

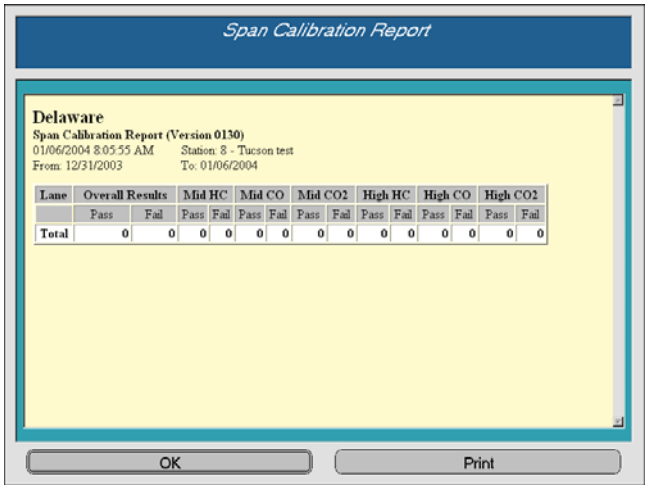
Calibration Reports

1. From the **Reports Menu**, click **Calibration Reports**.
2. The **Calibration Reports Menu** opens and includes the following options:
    a. Span Calibration Report
    b. Pressure Leak Check Report
    c. Sample Leak Check Report

Span Calibration Report

1. From the **Calibration Reports Menu**, click **Span Calibration Report**.
2. The **Span Calibration Report** window opens. Select the date range for the report.

   Example: December 31, 2003 to January 6, 2004.
3. Click OK to proceed.
4. The Span Calibration Report displays for the range selected in the previous step as shown below:

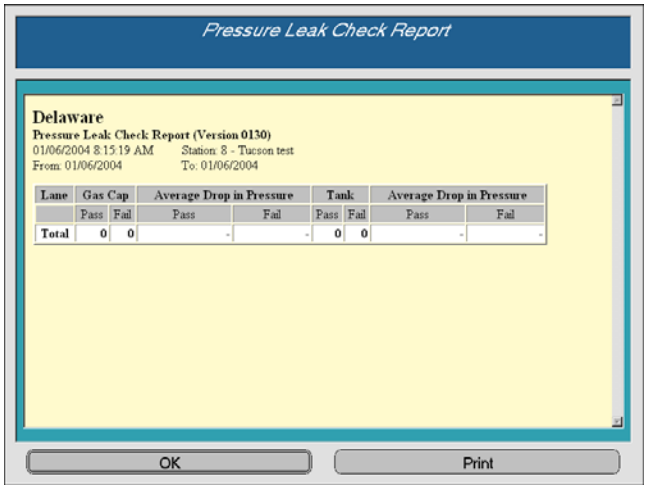


Lane	Overall Results		Mid HC		Mid CO		Mid CO2		High HC		High CO		High CO2	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0

5. Click **OK** to return to the **Calibration Reports Menu** or click **Print** to print the **Span Calibration Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Span Calibration Report** window, click **OK** to return to the **Calibration Reports Menu**.

Pressure Leak Check Report

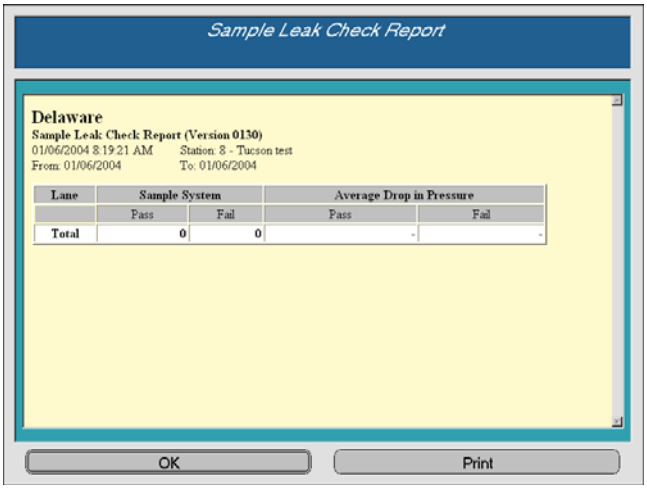
1. From the **Calibration Reports Menu**, click **Pressure Leak Check Report**.
2. The **Pressure Leak Check Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The **Pressure Leak Check Report** displays for the range selected in the previous step as shown below:



5. Click **OK** to return to the **Calibration Reports Menu** or click **Print** to print the **Pressure Leak Check Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Pressure Leak Check Report** window, click **OK** to return to the **Calibration Reports Menu**.

Sample Leak Check Report

1. From the **Calibration Reports Menu**, click **Sample Leak Check Report**.
2. The **Sample Leak Check Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The **Sample Leak Check Report** displays for the range selected in the previous step as shown below:



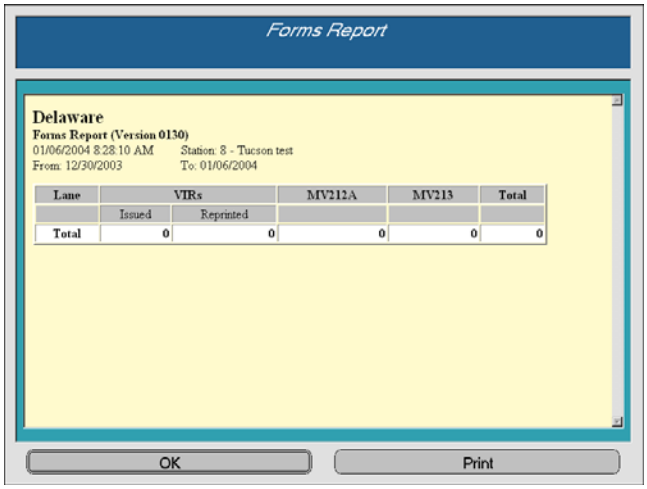
5. Click **OK** to return to the **Calibration Reports Menu** or click **Print** to print the **Sample Leak Check Report.**
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Sample Leak Check Report** window, click **OK** to return to the **Calibration Reports Menu**.

Performance Reports

1. From the **Reports Menu**, click **Performance Reports**.
2. The Performance Reports Menu opens and includes the following options:
    a. Forms Report
    b. Throughput Report
    c. Inspection Subtest Report
    d. Initial Inspection Subtest Report
    e. Retest Inspection Subtest Report
    f. Average Test Time Report

Forms Report

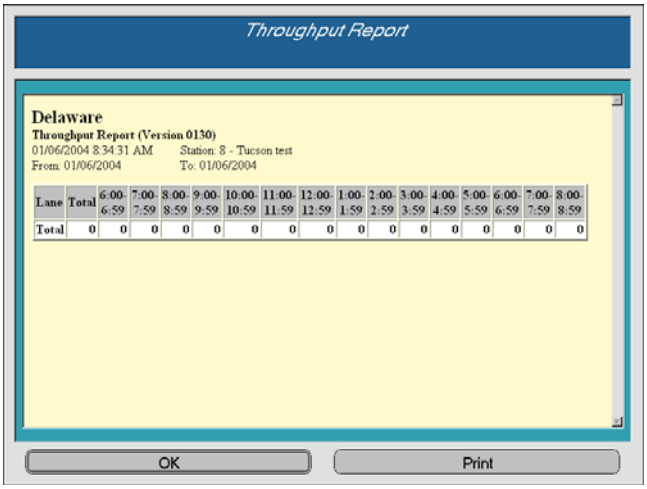
1. From the **Performance Reports Menu**, click **Forms Report**.
2. The **Forms Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The Forms Report displays the total number of Vehicle Inspection Reports issued and reprinted, and 212A and 213 forms printed for the ranges selected in the previous step as shown below:



5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **Forms Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Forms Report** window, click **OK** to return to the **Performance Reports Menu**.

Throughput Report

1. From the **Performance Reports Menu**, click **Throughput Report**.
2. The **Throughput Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The Throughput Report displays the total number of vehicles inspected each hour from 6:00 a.m. to 8:59 p.m. for the ranges selected in the previous step as shown below:

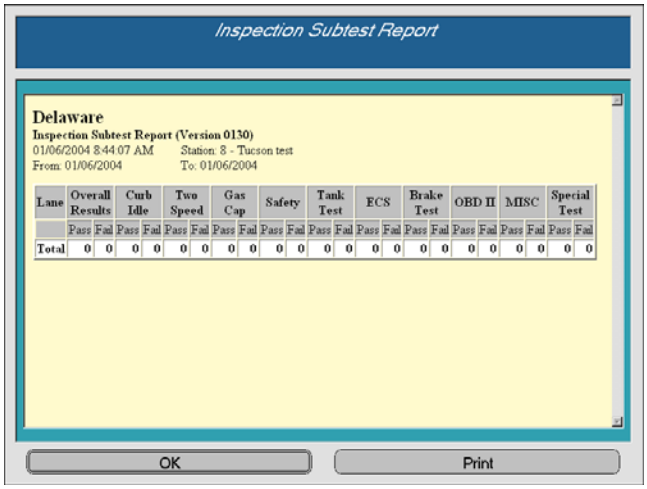


5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **Throughput Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Throughput Report** window, click **OK** to return to the **Performance Reports Menu**.

Inspection Subtest Report

1. From the **Performance Reports Menu**, click **Inspection Report**.
2. The **Inspection Subtest Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The Inspection Subtest Report displays the total number of Pass and Fail reports for the following subtests:
    - Overall Results
    - Curb Idle
    - Two Speed
    - Gas Cap
    - Safety
    - Tank Test
    - ECS
    - Brake Test
    - OBD II
    - MISC
    - Special Test

    See example below:

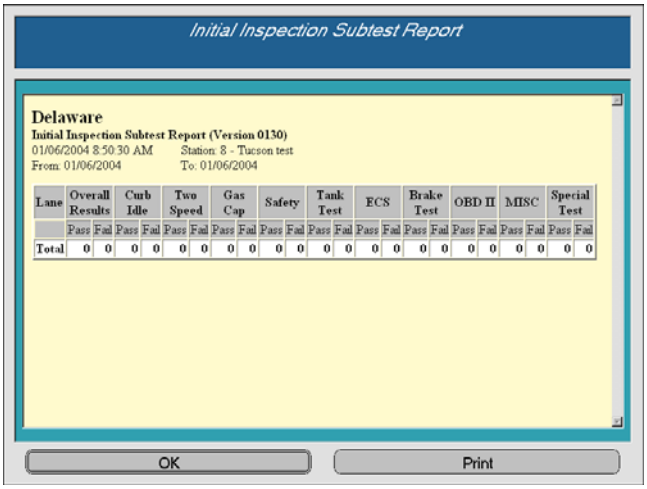


5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **Inspection Subtest Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Inspection Subtest Report** window, click **OK** to return to the **Performance Reports Menu**.

Initial Inspection Subtest Report

1. From the **Performance Reports Menu**, click **Initial Inspection Subtest Report**.
2. The **Initial Inspection Subtest Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The Initial Inspection Subtest Report displays the total number of Pass and Fail reports for the following subtests:
    - Overall Results
    - Curb Idle
    - Two Speed
    - Gas Cap
    - Safety
    - Tank Test
    - ECS
    - Brake Test
    - OBD II
    - MISC
    - Special Test

    See example below:

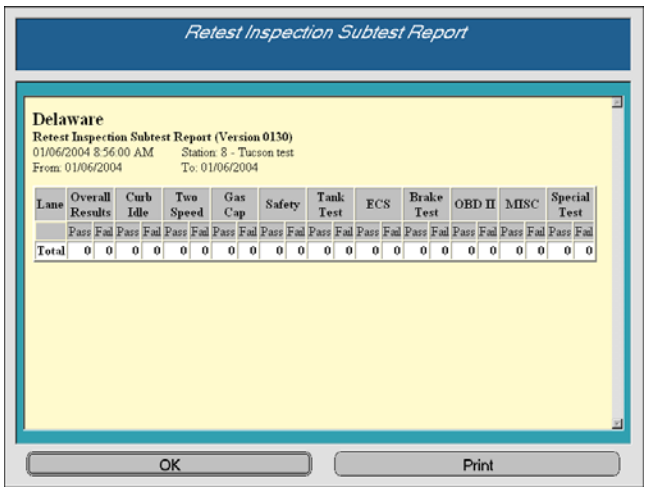


5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **Initial Inspection Subtest Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Initial Inspection Subtest Report** window, click **OK** to return to the **Performance Reports Menu**.

Retest Inspection Subtest Report

1. From the **Performance Reports Menu**, click **Retest Inspection Subtest Report**.
2. The **Retest Inspection Subtest Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The Retest Inspection Subtest Report displays the total number of Pass and Fail reports for the following subtests:
    - Overall Results
    - Curb Idle
    - Two Speed
    - Gas Cap
    - Safety
    - Tank Test
    - ECS
    - Brake Test
    - OBD II
    - MISC
    - Special Test

    See example below:

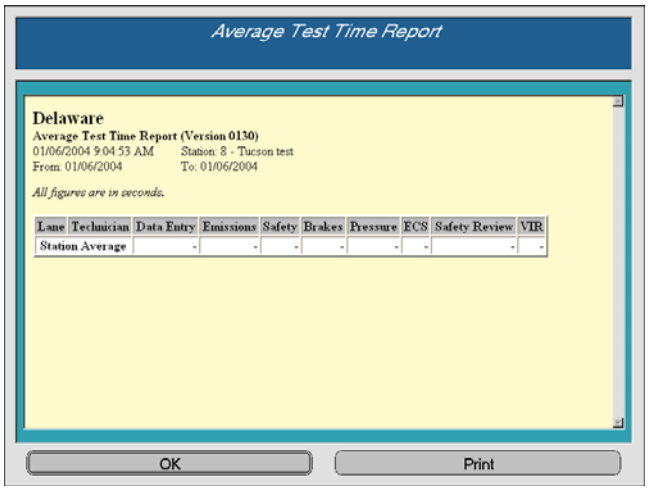


5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **Retest Inspection Subtest Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Retest Inspection Subtest Report** window, click **OK** to return to the **Performance Reports Menu**.

Average Test Time Report

1. From the **Performance Reports Menu**, click **Average Test Time Report**.
2. The **Average Test Time Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The Average Test Time Report displays the average test time for the following subtests:
    - Data Entry
    - Emissions
    - Safety
    - Brakes
    - Pressure
    - ECS
    - Safety Review
    - VIR

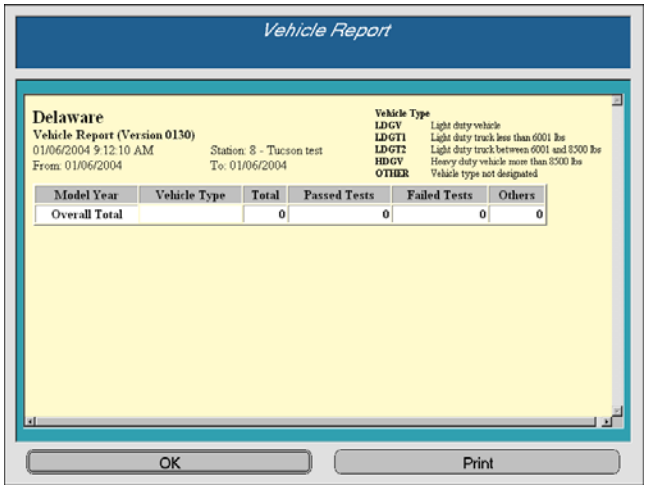
    See example below:



5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **Average Test Time Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Average Test Time Report** window, click **OK** to return to the **Performance Reports Menu**.

Vehicle Report

1. From the **Performance Reports Menu**, click **Vehicle Report**.
2. The **Vehicle Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The Vehicle Report displays the number of Pass, Fail and Other tests for each model year and vehicle type as show below:

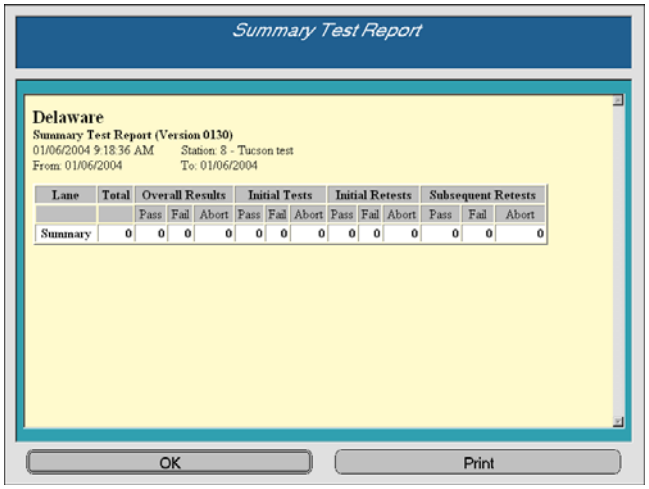


5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **Vehicle Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Vehicle Report** window, click **OK** to return to the **Performance Reports Menu**.

Summary Test Report

1. From the **Performance Reports Menu**, click **Summary Test Report**.
2. The **Summary Test Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The Summary Test Report displays Pass, Fail and Abort results for:
    - Overall Results
    - Initial Tests
    - Initial Retests
    - Subsequent Retests

    See example below:

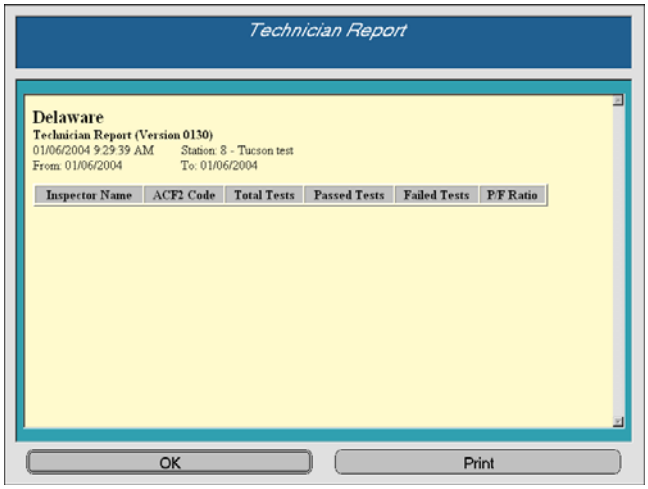


5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **Summary Test Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Summary Test Report** window, click **OK** to return to the **Performance Reports Menu**.

Technician Report

1. From the **Performance Reports Menu**, click **Technician Report**.
2. The **Technician Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The Technician Report displays the following technician information:
    - Inspector Name
    - ACF2 Code
    - Total Tests
    - Passed Tests
    - Failed Tests
    - P/F Ratio

   See example below:

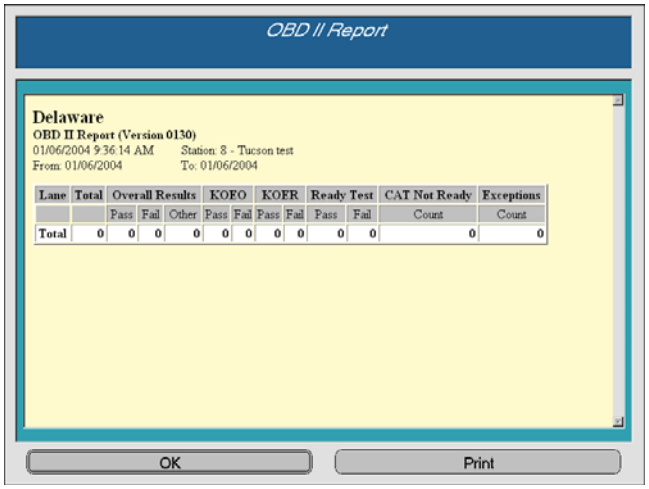


5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **Technician Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Technician Report** window, click **OK** to return to the **Performance Reports Menu**.

OBD II Report

1. From the **Performance Reports Menu**, click **OBD II Report**.
2. The **OBD II Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The OBD II Report displays the following Pass/Fail results for:
    - Overall Results
    - KOEO
    - KOER
    - Ready Test
    - CAT Not Ready (count)
    - Exceptions (count)

    See example below:

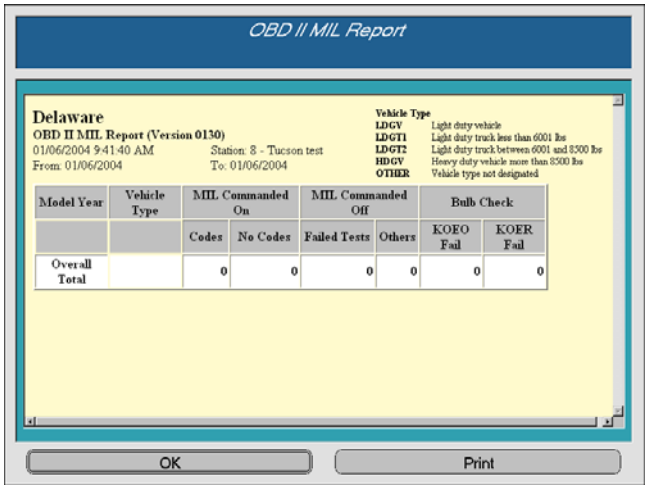


5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **OBD II Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **OBD II Report** window, click **OK** to return to the **Performance Reports Menu**.

OBD II MIL Report

1. From the **Performance Reports Menu**, click **OBD II MIL Report**.
2. The **OBD II MIL Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The OBD II MIL Report displays the following results for:
    - Model Year
    - Vehicle Type
    - MIL Commanded On (Codes – No Codes)
    - MIL Commanded Off (Failed Tests – Others)
    - Bulb Check (KOEO Fail – KOER Fail)

   See example below:

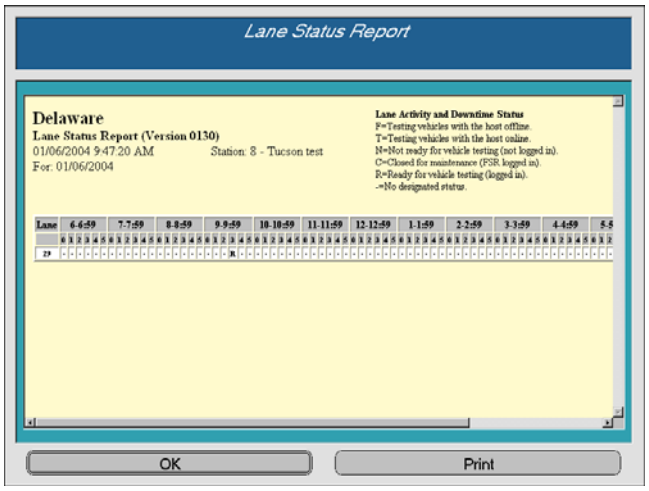


5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **OBD II MIL Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **OBD II MIL Report** window, click **OK** to return to the **Performance Reports Menu**.

Lane Status Report

1. From the **Performance Reports Menu**, click **Lane Status Report**.
2. The **Lane Status Report** window opens. Select the date range for the report.
3. Click **OK** to proceed.
4. The Lane Status Report displays Lane Activity and Downtime Status for each lane beginning at 6:00 a.m. and ending at 8:59 p.m. using the following codes:
    - F Testing vehicles with the host offline
    - T Testing vehicles with the host online
    - N Not ready for vehicle testing (not logged in)
    - C Closed for maintenance (FSR logged in)
    - R Ready for vehicle testing (logged in)
    - - No designated status

    See example below:



5. Click **OK** to return to the **Performance Reports Menu** or click **Print** to print the **Lane Status Report**.
    a. Once the report is printed, the **Print** dialog box opens and displays the following message: **Printing Completed**. Click **OK** to close the dialog box.
    b. From the **Lane Status Report** window, click **OK** to return to the **Performance Reports Menu**.

Appendix B Peripheral Equipment

OVERVIEW

This chapter gives you instructions regarding use of the peripheral test equipment that comes with your SystemOne® Analyzer.

USING THE BAR CODE

The 2-D Bar Code Scanner allows data input without using the keyboard. Follow these guidelines:

1. Hold the Bar Code Scanner over the bar code at an angle of 0º - 30º back from the surface, or 20º – 50º forward toward the surface.

   NOTE: Do **NOT** hold the scanner at a 90º angle directly over the bar code. **ALWAYS** hold it at a tilt within the ranges indicated above. This avoids causing the beam to reflect back on itself, thus "blinding" the scanner.

2. Pull the trigger on the scanner.
3. Aim the scanner so that the scan line extends at least ¾-inch beyond the edges of the bar code. You may have to adjust the angle and/or distance of the scanner to obtain proper positioning.
4. When the scan is complete, the scanner beeps, and data scanned appears in the appropriate fields.

USING THE RF REMOTE CONTROL UNIT

The SystemOne® comes with an RF Remote Control that allows a Technician to control the computer keyboard's arrow keys and the Enter key from a remote location, such as the driver's seat of a vehicle under test. The RF Remote Control unit operates best within a distance of 30 feet maximum from the analyzer.

POSITIONING AND USING THE RPM PROBES

The SystemOne® comes equipped with two types of RPM probes: the contact probe (fits around an ignition wire) and a non-contact probe (placed on the vehicle's hood).

To position these probes:

Contact RPM Probe

This probe is used on conventional ignition systems (pre-distributorless). Place it on any spark plug wire. To do this:

1. Open the jaws of the probe.
2. Place one wire with the spark plug marking pointed toward the spark plug.
3. Close the jaws of the probe and proceed with the test.

Non-Contact RPM Probe

The Non-Contact RPM Probe offers a revolutionary method of measuring engine speed without making connections to the vehicle's ignition system. Engine speed is determined by detecting the Radio Frequency (RF) signals that are present in the air each time an ignition spark occurs.

Because the ignition system is but one source of RF, it is possible that extraneous RF signals may cause erratic or incorrect RPM readings. This is especially likely to happen if specific operating instructions are not observed. To ensure an accurate RPM signal, be sure to adhere to the following procedures.

NOTE: For GEN II analyzers, toggle the RPM switch on the side of the cabinet to non-contact.

Take these steps before you position the Non-Contact RPM Probe:

1. Make sure that all vehicle doors are closed to prevent key-reminder buzzer operation.
2. Turn off all electrical motors (such as the heater blower).
3. Power down all electrical devices that repeatedly cycle on and off (such as some AC clutches).
4. Make sure that the engine is running at normal temperature.
5. Place the probe on the vehicle's hood. Follow the guidelines in the box at the end of this section.
6. Start with the gain switch (on the side of the probe) set to the minimum gain position. If a strong signal cannot be obtained, move the gain switch to the center

position and try again. If a strong signal still cannot be obtained, try the maximum gain switch position.

7. Press the switch located on the probe. Observe both the probe's Light Emitting Diode and the signal strength meter on the Help display. The LED should be blinking 10 times per second, and the signal strength should be at least nine (one blink per second indicates an invalid reading).
8. If the RPM is incorrect, position the probe close to the distributor, spark plug wires or coil module and move outward from there. Rotate the probe a quarter of a turn at each location; notice that the LED blinks faster as the signal strength increases. This method makes it possible to obtain the proper signal without looking at the Help display on the monitor.
9. When sufficient signal strength is obtained, increase engine speed to approximately 2500 RPM. Make sure a good signal remains throughout the engine speed range. If not, try another location.

Hints for Positioning the Non-Contact RPM Probe

- The most frequent location for a strong RPM signal is found on the windshield of the vehicle. With the engine at idle; position the non-contact RPM probe on the windshield with the 'T' parallel to the windshield wiper blade. Try all 3 gain positions, starting at minimum. (Figure 1)
- If the signal cannot be found in this orientation, try rotating perpendicular to the windshield wiper blade and using all 3 gain positions. (Figure 2)
- If the signal cannot be found on the windshield, place the probe toward the center of the vehicle's hood and reset the gain to the lowest setting. Try different orientations and gain settings.
- Allow the probe two-to-three seconds to process the signal before trying another gain setting.
- If used under the hood, do not allow the probe to contact hot or moving engine components (for example, the exhaust manifold, fan or pulleys).
- For engines with opposing cylinders (such as rear-engine VWs), try positioning the probe outside the engine compartment on the bumper.

Figure 1

Figure 2

POSITIONING AND USING THE EXHAUST PROBES

On most vehicles, you can use the standard exhaust probe that is attached to the analyzer unit.

- Insert the exhaust probe in the tailpipe according to the instructions on the monitor.
- If the tailpipe has a screen over it, you will need to use the alternative anti-dilution probe that came with the SystemOne® package.
- If the vehicle has two exhaust pipes, attach the second flexible probe and hose to the quick disconnect on the main exhaust hose 'Y' and insert one flexible probe into each exhaust pipe.

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