Davis County Vehicle Inspection System Operator's Manual

DriveClean Inspection System

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1.Introduction

This manual provides important operating information, features, and helpful tips concerning the Davis County inspection system and associated components. This introductory section describes the conventions used in this manual as well as general safety tips.

1.1 Conventions and safety

1.1.1 Conventions

This operator's manual is organized to facilitate quick access to sections and topics related to the Davis County inspection system and the vehicle inspection process. Occasionally, text of particular importance will be emphasized using the conventions described below.

Text pertaining to features appearing on the DriveClean touchscreen such as buttons or bars that activate functions or display data are highlighted in **bold green type**.

The **stop icon** draws attention to issues concerning safety of personnel and equipment. Please read carefully and follow all instructions.

The **important information icon** draws attention to important procedural tips or inspection system features.

1.1.2 Important general safety instructions

Please read the following instructions carefully before using equipment.

- Read and follow all inspection system instructions.
- When using your Davis County DriveClean inspection system, follow all safety instructions.
- Only use Davis County inspection system equipment as described in this manual.
- Remain in the vehicle as needed during emissions testing.
- Please handle equipment with care. Inspection system components can be damaged through carelessness.
- Do not drop equipment.
- Do not let cables or cords hang over edge of a table, bench, or counter; or contact hot manifolds or moving fan blades.
- Care should be taken to arrange cables and cords so that they will not create a tripping hazard or become pulled out causing equipment to malfunction or shut down.

- Always have adequate ventilation when working on vehicles with the engine running.
- Use only manufacturer-designated peripherals and accessories.
- Follow all Davis County and Davis County Health Department policies and procedures. In case of discrepancy, Davis County Health Department policies and procedures supersede this manual.

2. Mobile source air toxics and improving air quality through testing

Mobile source air toxics[1] are compounds emitted from highway vehicles and nonroad equipment that are known or suspected to cause cancer or other serious health and environmental effects. Mobile sources are responsible for direct emissions of air toxics and contribute to precursor emissions that react to form secondary pollutants. Examples of mobile source air toxics include benzene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein, polycyclic organic matter (POM), naphthalene, and diesel particulate matter.

Cancer and noncancer health effects can result from exposures to air toxics.

In February 2007, EPA finalized a rule to reduce hazardous air pollutants from mobile sources. The rule limits the benzene content of gasoline and reduces toxic emissions from passenger vehicles and PAS cans. EPA estimates that in 2030 this rule will reduce total emissions of mobile source air toxics by 330,000 tons and VOC emissions (precursors to ozone and PM2.5) by more than 1 million tons.

EPA has adopted many mobile source emission control programs that, in addition to controlling pollutants such as hydrocarbons, particulate matter, and nitrogen oxides, will also result in large air toxic reductions.

Inspection and maintenance programs

Vehicle inspection and maintenance programs (I/M) help improve air quality by identifying high-emitting vehicles in need of repair (through visual inspection, emissions testing, and/or the downloading of fault codes from a vehicle's onboard computer) and causing them to be fixed as a prerequisite to vehicle registration within a given non-attainment area. The 1990 Amendments to the Clean Air Act made I/M mandatory for several areas across the country, based upon various criteria, such as air quality classification, population, and/or geographic location.

On-board diagnostics

On-Board Diagnostics, or OBD, is a computer-based system built into all 1996 and later light-duty vehicles and trucks to monitor a vehicle's engine, transmission, and emissions control components. If a vehicle's **Check Engine** light comes on and stays on, the vehicle's OBD system is alerting the motorist that it has detected a problem with the vehicle.

In addition to protecting the environment, the Check Engine light and the OBD system behind it can save motorists time and money by identifying minor problems before they become major repair bills.

[1] From http://www3.epa.gov/otaq/toxics.htm

3.Features and capabilities

3.1 Introducing the Davis County inspection system

The Opus team is very pleased to introduce the Davis County inspection system for emissions testing in the Davis County I/M program. The high-tech Opus IVS DriveClean OBD-only tablet inspection system provides the best possible operational functionality and flexibility, maximizing customer convenience and test efficiency.

All DriveClean tablets and peripheral equipment are networked and tied into the Opus Davis County VID, communicating wirelessly in real-time. All equipment meets or exceeds the specifications contained in the EPA, State of Utah, and Davis County Health Department regulations, guidance, or requirements.

Davis County inspection system components include:

- Integrated tablet unit with touchscreen
- Integrated OBD with 4-foot cable, 2D barcode scanner, front/rear cameras
- OBD Self-Check Cable
- OBD Self-Check 12 VDC power supply
- Docking station with power cord
- Wi-Fi Printer
- Wi-Fi Router
- Davis County Win10 Baseline—DriveClean Tablet Systems
- Operator's Manual

With the DriveClean OBD-only tablet, authorized inspectors can perform a test in any bay or exterior area of the station.

3.1.1 DriveClean tablet—front view

Figure 1: DriveClean tablet—front view

The front view of the DriveClean tablet (Figure 1) shows the location of the dual-purpose front-mounted camera used for fingerprint identity verification and for capturing an image of the inspector upon login. The power switch is also located just below the screen. Also shown is the location of the barcode reader on the top of the tablet housing and the kickstand that can be pulled out for upright operation, hung on a steering wheel, or snapped in-place on the back so the tablet can lay flat.

3.1.2 DriveClean tablet—rear view

Figure 2: DriveClean tablet—rear view

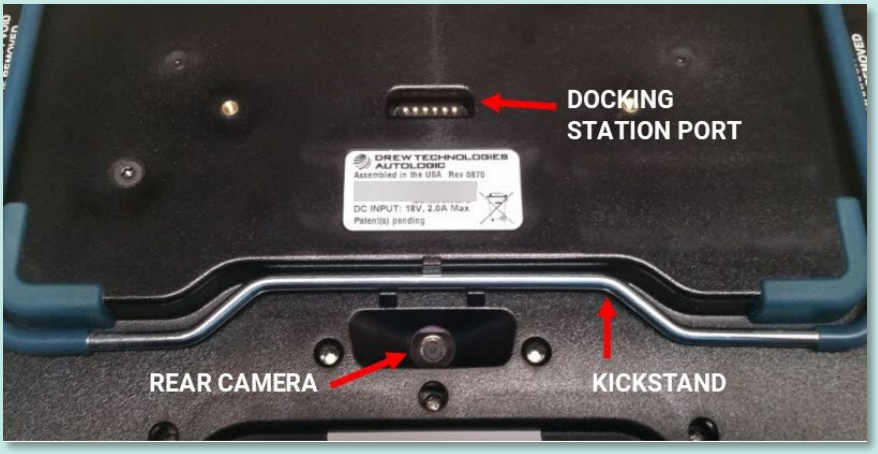


Figure 2 shows part of the rear of the DriveClean unit. The slightly recessed rear camera—used to document license plates, door labels, and VINs—is located near the bottom. When the DriveClean unit is set into its docking station, the docking station plug will engage with the port on the back of the DriveClean. The kickstand is also shown in its stored position, allowing the DriveClean unit to lay flat.

3.1.3 DriveClean tablet—top view

Figure 3: DriveClean tablet-top view

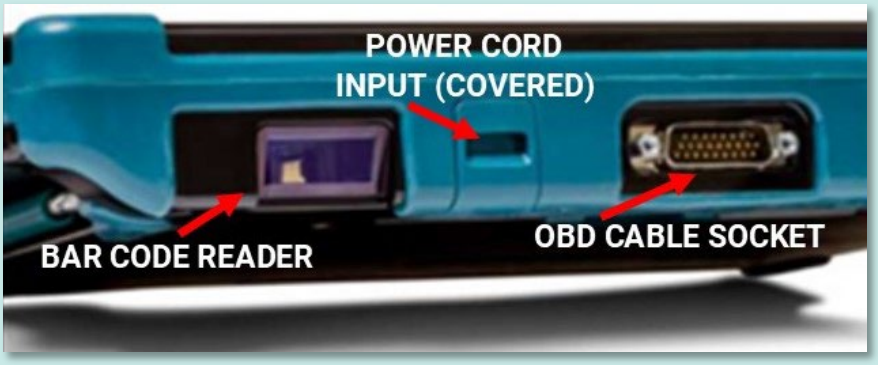


Figure 3 shows the top of the DriveClean tablet unit housing. The 2D barcode reader, located at the top right, illuminates with a red light when activated and features a bright red central dot for centering the scan. The power cord input is for the supplied 18-volt, 2.0-amp DC connector. The OBD cable plugs securely into the top center of the DriveClean unit.

3.2 Inspection system software—security and convenience

The Davis County inspection system is automated to the highest degree possible to minimize the potential for fraud and human error and is exceedingly secure from tampering and abuse.

Inspectors are guided through the testing process by the inspection software and are not allowed to deviate from approved test procedures. Opus engineers carry this security strategy to its logical conclusion by:

- Automating pass, fail, and rejection decisions; and
- Performing system integrity checks before each test, as applicable;

In short, the system:

- Uses automation to decrease, to the highest degree possible, the potential for intentional fraud and/or human error;
- Provides security from tampering and/or abuse; and
- Is based on detailed written specifications.

The software is designed to automatically:

- Make pass/fail decisions for all measurements;
- Record and store all equipment check, calibration, and test data; and
- Initiate immediate lockouts for violation of pre-defined security parameters of failure to conduct or pass required quality assurance procedures.

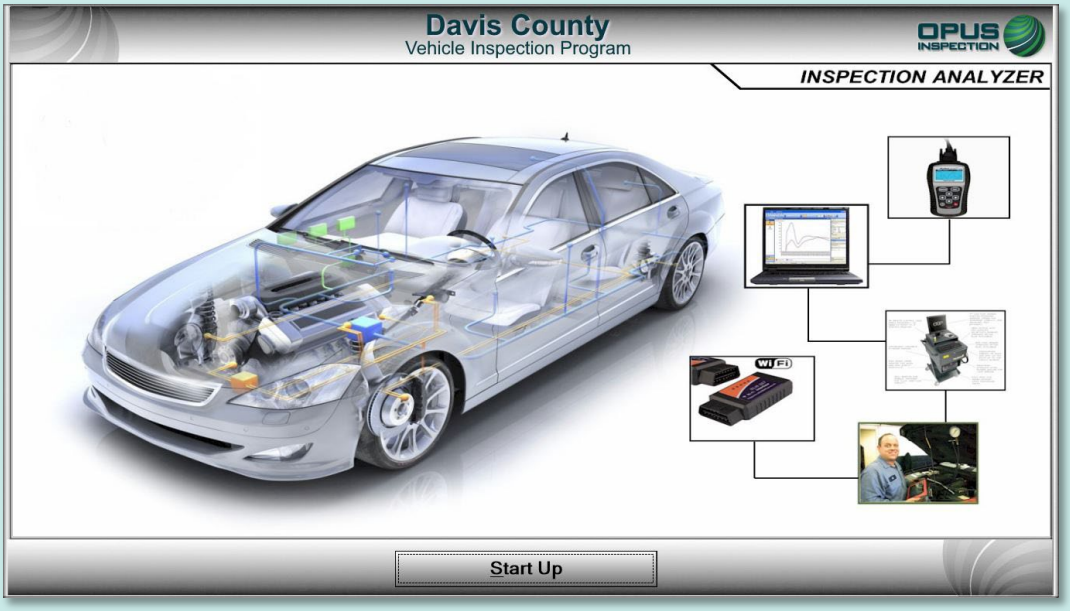
4.System startup, operation, and shut down

The DriveClean menus provide access to the functions you need to perform vehicle inspections. The menu system also allows you or your station manager to carry out necessary administrative tasks. This chapter explains these features and how to apply them to the routine operation of your inspection system. Detailed descriptions of selected functions referenced in this section are contained in other chapters in this manual.

4.1 Startup menu

The startup screen (Figure 4) appears when the DriveClean tablet is turned on. Select **Start Up** to prepare the tablet (analyzer), refresh data, and then display the **Main Menu**.

Figure 4: Inspection system startup



During the startup sequence, screens will briefly appear displaying activities such as synchronizing with the vehicle inspection database (VID) server (Figure 5), checking for and applying pending software updates, reconciling test records with the VID, and updating vehicle lookup tables (Figure 6).

Typically, the inspection system startup should take only a minute or two. If any problems or errors are encountered during startup, you will be prompted to seek assistance.

Figure 5: System startup in progress

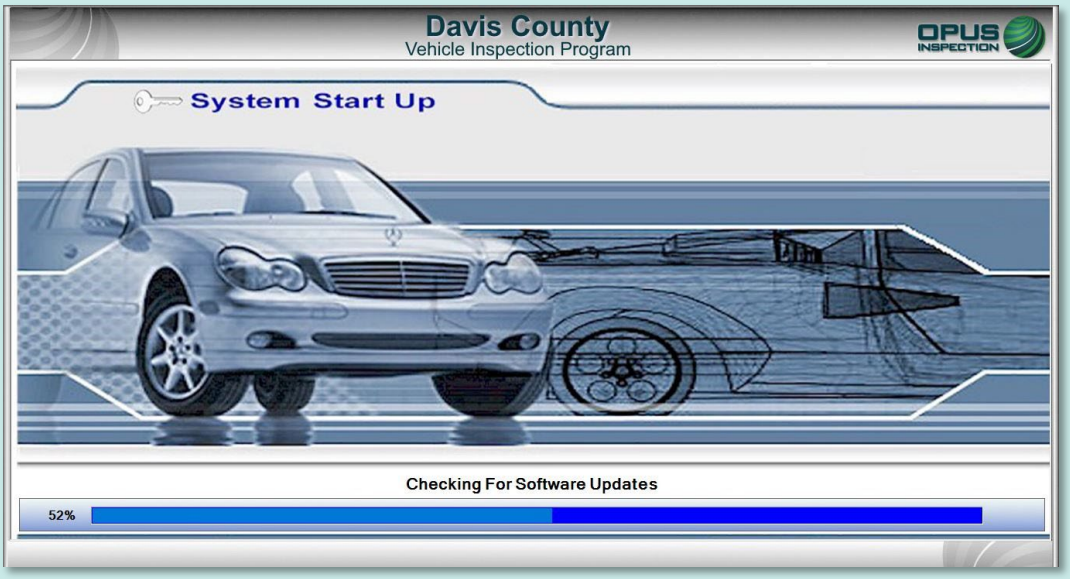
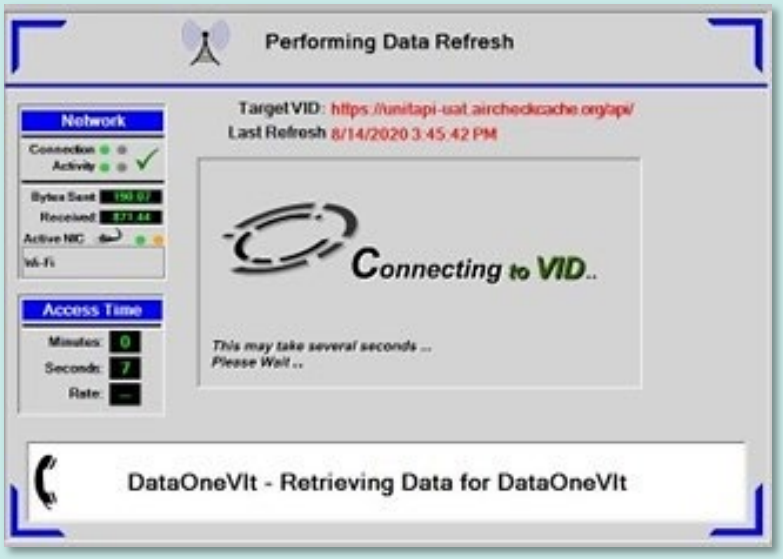


Figure 6: System startup—connecting to VID



4.1.1 Software update prompt

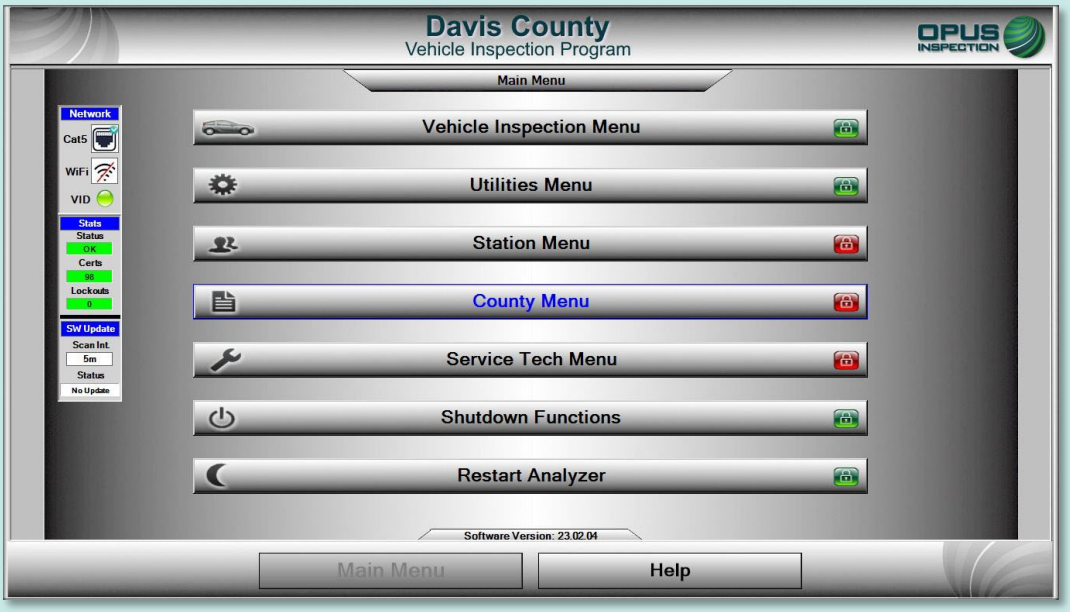
Occasionally, a pop-up box will appear notifying you of a pending inspection system software update. This may occur at any time, most often at startup, but never during an actual inspection. You will be prompted to tap **Yes** on the touchscreen to initiate the update, or **No** to defer the update to a more optimal time. Typically, software updates will only take five to ten minutes and during the update the DriveClean tablet may reboot one or more times. You will be notified when the software update has been completed.

If you choose to defer the update (such as when a customer is waiting or other time-sensitive issue arises), the inspection system will allow you to continue; however, the update pop-up box will soon reappear. To ensure optimal system performance and compliance with any changes to the inspection process, we highly recommend initiating the software update as soon as possible. Prolonged deferment of the software update may trigger a lockout.

4.2 Inspection system operation

4.2.1 Main menu

Figure 7: Main menu



The menu options listed below are available from the **Main Menu** (Figure 7).

Menu options labeled with a red lock icon are only available to authorized station, County, or Opus personnel.

- **Vehicle Inspection Menu:** Authorized station users can select this menu to perform a vehicle inspection, view remaining certificates, perform an OBD self-check, perform calibrations, or run the system in demo or training mode.
- **Utilities Menu:** Any user can select this menu to check equipment consoles, reprint a VIR, view analyzer status information, access diagnostic test modes, initiate communications sessions, choose printers, or view lockouts.
- **Station Menu:** Authorized station users can select this menu to view inspector information, purchase certificates, access a certificate usage report, and access the web portal.
- **County Menu:** Authorized County officials can select this menu to perform designated activities, such as view inspection information, perform waiver vehicle inspections, perform compliance/referee inspections, access the camera console, set and view lockouts, modify workstation (DriveClean tablet analyzer) configuration, and access the overt audit checklist.
- **Service Tech Menu**: Authorized Opus users utilize this selection to check and manage consoles, perform an OBD self-check, view analyzer status, access communications tools, set and view lockouts, and modify workstation configurations.
- **Shutdown Functions:** Any user can use this menu to shut down or restart the DriveClean tablet
- **Restart Analyzer:** Activating this button restarts the DriveClean tablet.
- **Help:** Selecting this button displays the system documentation. The **Help** button is available on multiple screens.

4.2.2 Inspection screen dashboards

An on-screen dashboard (Figure 8) appears at the top of screens pertaining to vehicle inspection, training/demo mode, and diagnostic processes. The dashboard displays:

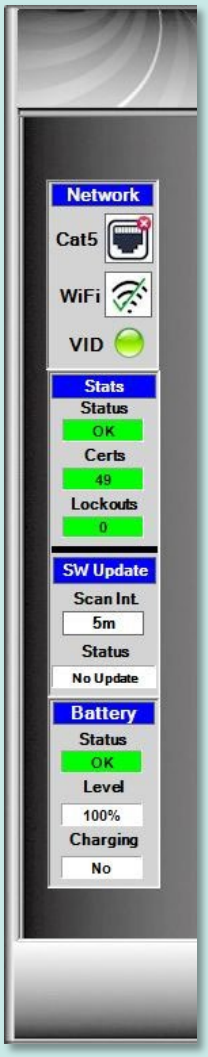
- Test mode
- Inspector
- Plate
- Lockout status
- Inspection start time
- Current time
- Duration of inspection

A green thermometer is integrated with the dashboard that tracks the progress of the five-stage vehicle inspection process, from vehicle entry to the printing of the VIR.

Figure 8: Inspection screen dashboard

A vertical dashboard (Figure 9) also appears on inspection and menu screens. This dashboard monitors communication, unit information (such as lockout and certificates), software, and battery status.

Figure 9: Vertical dashboard



4.2.3 Printer connection

The DriveClean portable tablet and the printer are connected via the Wi-Fi connection to the wireless access point (WAP).

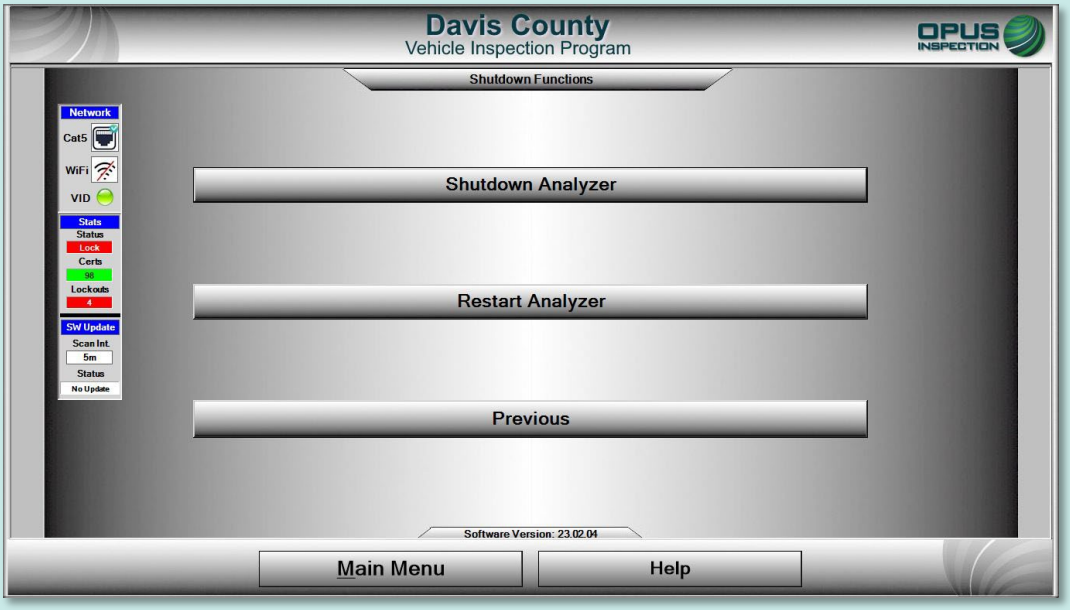
4.2.4 Offline operation

If the DriveClean tablet is not online with the VID, the system allows transactions to queue up to be sent as soon as the unit is back online, and communication is re-established with the VID. The software for Davis County allows transactions to be processed by comparing a time stamp of when the system was last connected to the VID to the current date.

4.3 System shutdown

To shut down the inspection system, select **Shutdown Functions** from the **Main Menu**. The **Shutdown Functions** screen will appear (Figure 10, next page). Tap **Shutdown Analyzer** to shut down the DriveClean tablet and power down the components. You also have the option of restarting the DriveClean should it be necessary to do so.

Figure 10: Shut down functions menu



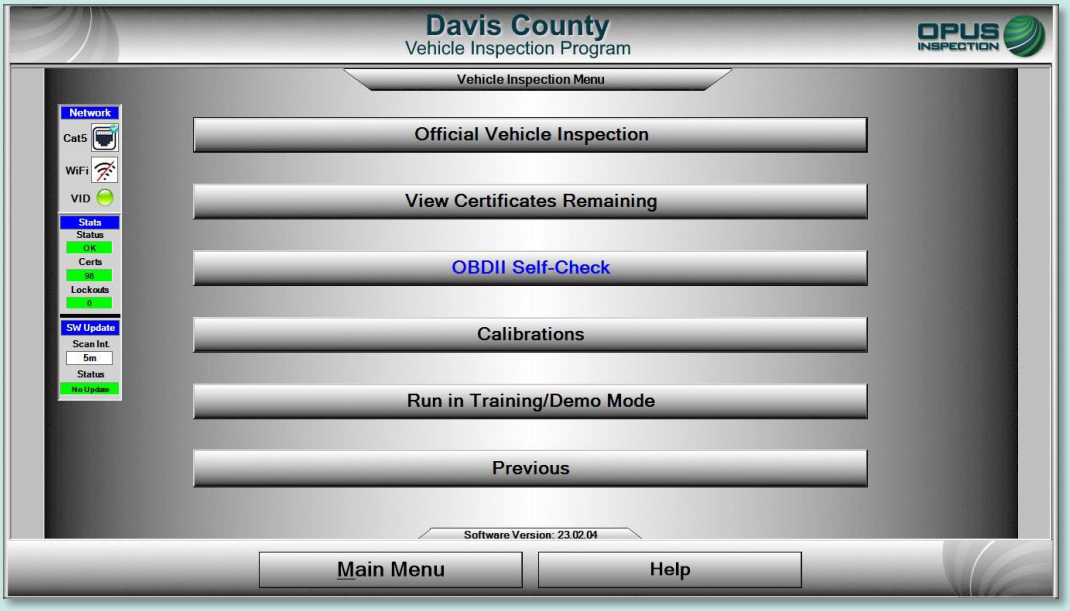
5. Vehicle inspection

This section of the Davis County inspection system operator's manual describes the entire vehicle inspection process, including vehicle identification, analyzer calibration, performing OBD and TSI inspections, and issuing the vehicle inspection report.

5.1 Official vehicle inspection

From the **Main Menu** displayed on the touchscreen, select the **Vehicle Inspection Menu** (Figure 11). To begin the inspection, select **Official Vehicle Inspection** from the **Vehicle Inspection Menu**.

Figure 11: Vehicle inspection menu



The same sequence of inspection screens will appear when **Waiver Vehicle Inspection** and **Compliance/Referee Assurance Vehicle Inspection** options are selected from the **County Menu**, with overrides appropriate to the these tasks.

5.1.1 Inspector login

Before beginning the vehicle inspection, the inspector must login using manual validation. (Figure 12). From the touchscreen keyboard, enter your five-digit inspector number (or select from the drop-down list) and password in the indicated fields and tap **Continue**. The inspection system will display an error message on invalid entries (Figure 13).

Figure 12: Manual validation login prompt

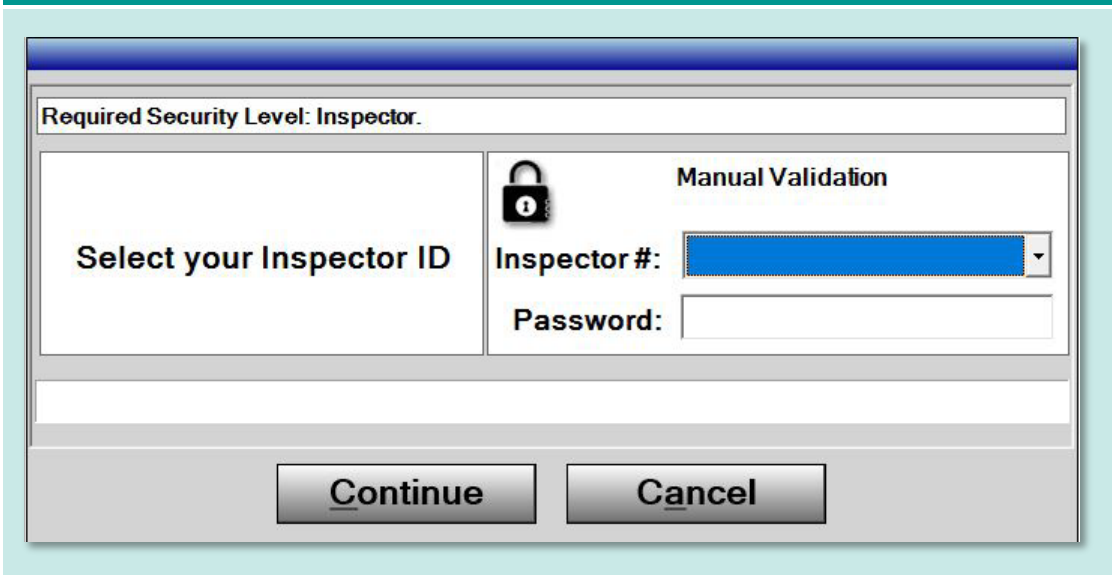
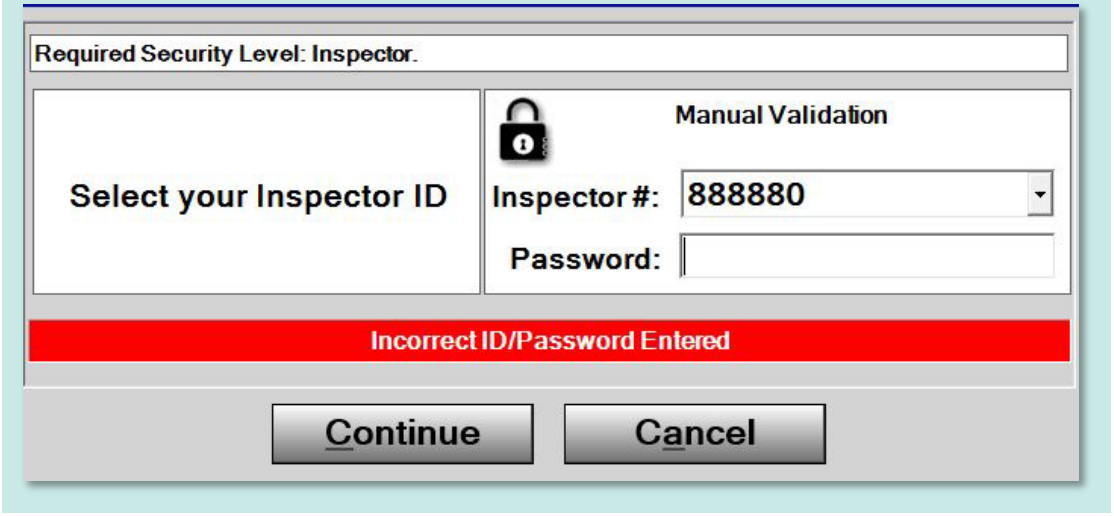


Figure 13: Incorrect ID or password entered



Inspection system messaging

In the interim between login and commencement of the vehicle inspection, the inspection system may display screens indicating the following:

- Validation of inspector name and password through the vehicle inspection database (VID);
- Notification of an expired account;
- Notification of inspection system lockout;

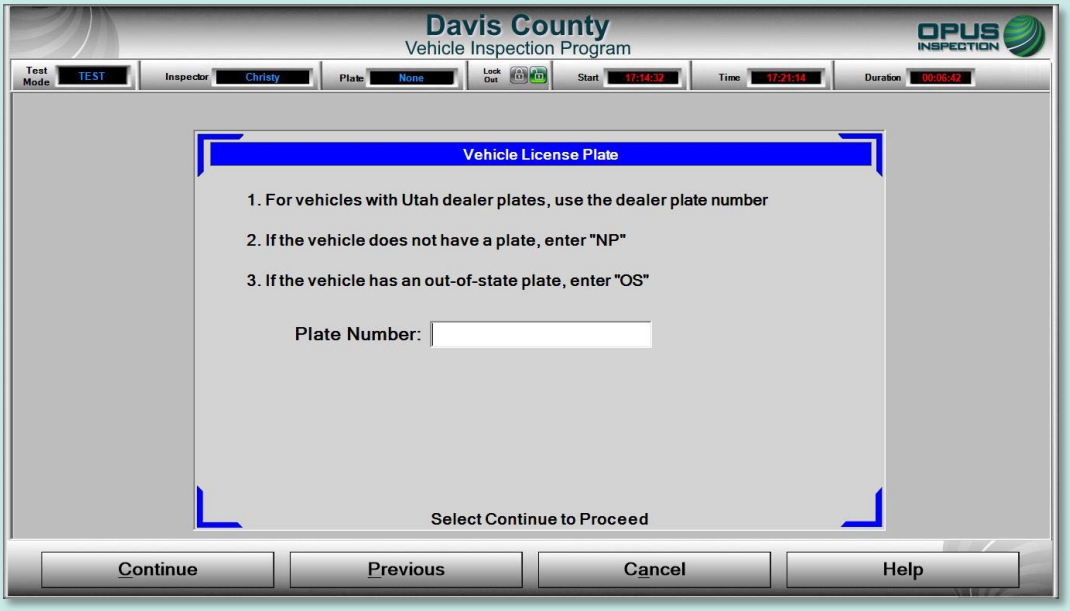
- Messages posted by County officials or Opus technical support; or
- Other system notifications.

Depending on the nature of the communication, you may be requested to standby or provided with instructions for resolving any issues prior to beginning the inspection process.

5.1.2 Vehicle license plate entry procedure

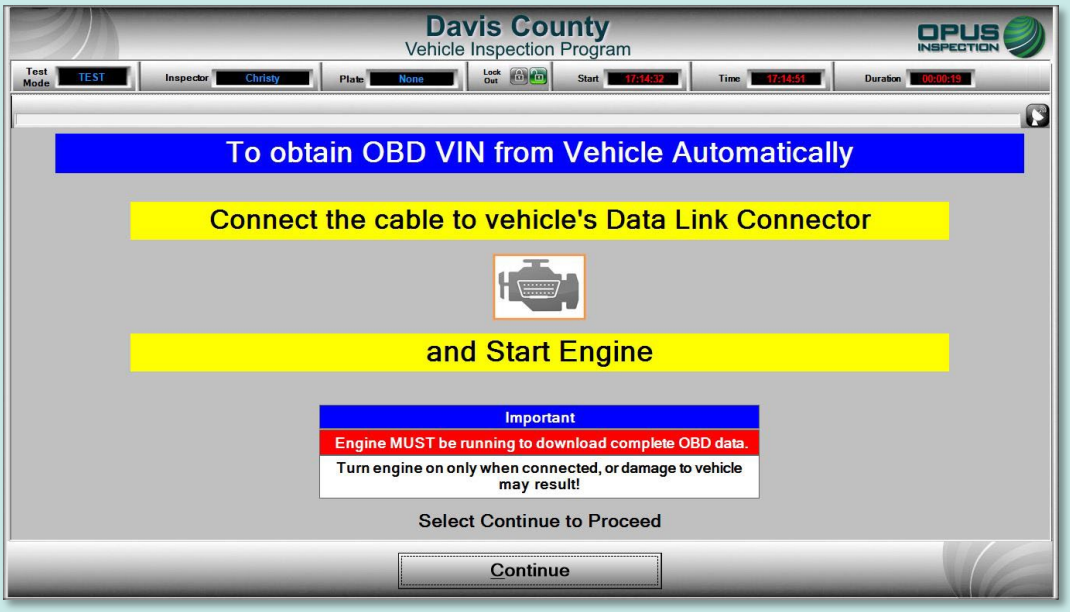
The **Vehicle License Plate** entry screen (Figure 14) will appear. Enter the vehicle's plate number in the field provided using the DriveClean's touchscreen keyboard. As necessary, follow the instructions on the screen pertaining to a vehicle with a Utah dealer's plate, a vehicle with no plate at all, or a vehicle with an out-of-state license plate. Tap **Continue** when finished.

Figure 14: Entering the vehicle license plate



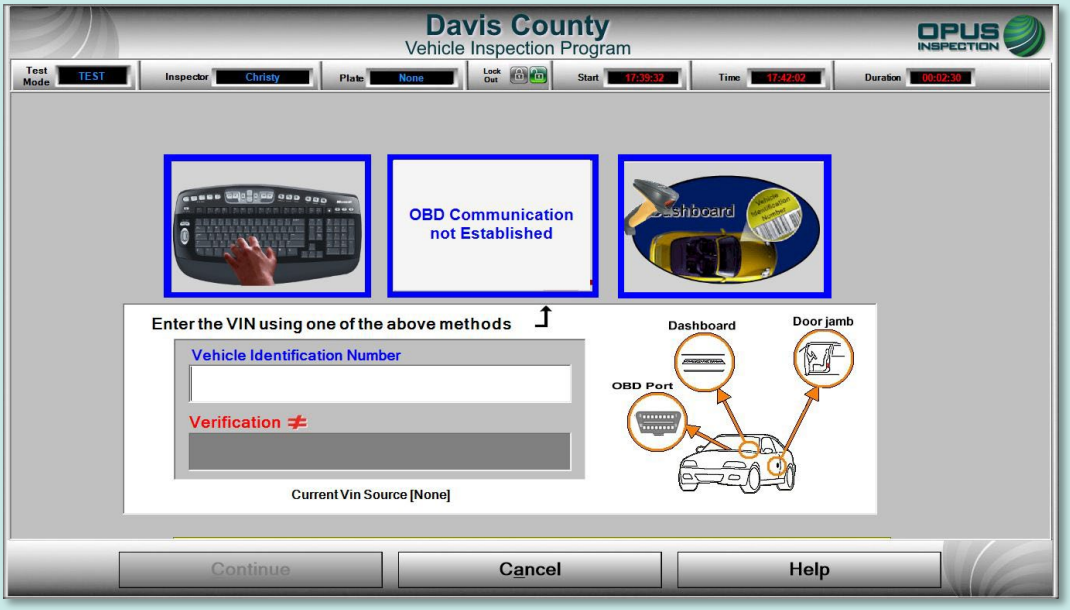
Following the license plate entry, you will be prompted to connect the OBD data link connector and start the vehicle's engine (Figure 15).

Figure 15: Prompt to connect OBD data link connector



In the event you are unable to successfully connect to the vehicle's DLC, a message will appear in the center box (Figure 16). Enter the VIN using one of the other methods indicated on the screen.

Figure 16: DLC connection failure



5.1.3 VIN entry

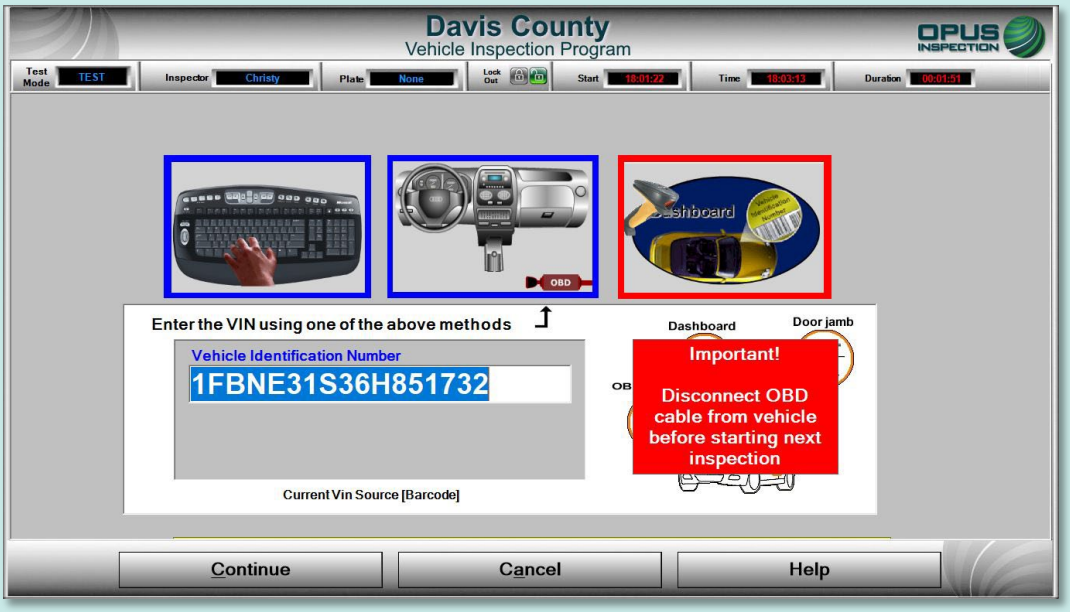
The inspection system will automatically perform the OBD test and scan the vehicle's system for the vehicle identification number (VIN).

- If the VIN is obtained through the OBD connection, you will be prompted to disconnect the OBD cable and proceed to the next step in the inspection.
- If the vehicle does not support obtaining the VIN through the OBD connection (see Figure 16), the VIN will need to be either entered manually or scanned using the barcode scanner. The screen will provide both options.

Note that to ensure accuracy, *manual entry* of the VIN is a double-blind process.

After the vehicle's VIN has been entered, either using the DriveClean tablet's barcode scanner (Figure 17). or through manual entry using the touchscreen keyboard, tap **Continue**

Figure 17: Barcode scan of vehicle VIN



The VIN entry screen features a blinking red/blue reminder in the lower-right corner to disconnect the OBD cable before proceeding to the next step in the inspection.

5.1.4 Data verification

Data verification is an important step in documenting the vehicle inspection process. The license plate state, plate number, and VIN will appear on the Data Verification screen (Figure 18). This screen will require you to select emissions **Decal PRESENT** or **Decal MISSING**, then confirm the selection (Figure 19).

Figure 18: Data verification screen

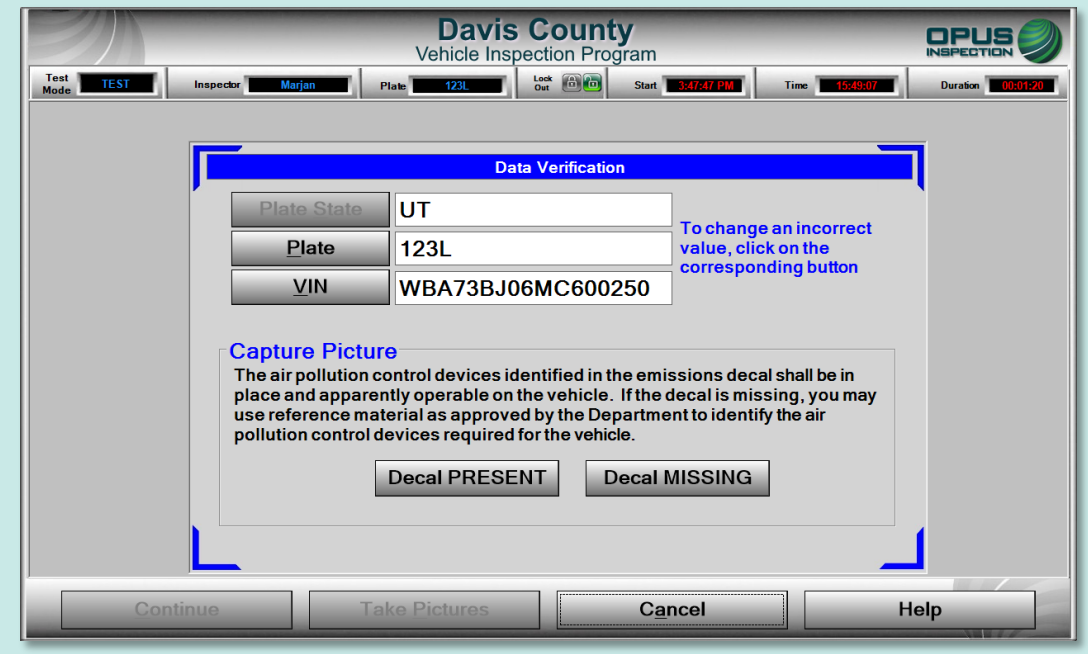
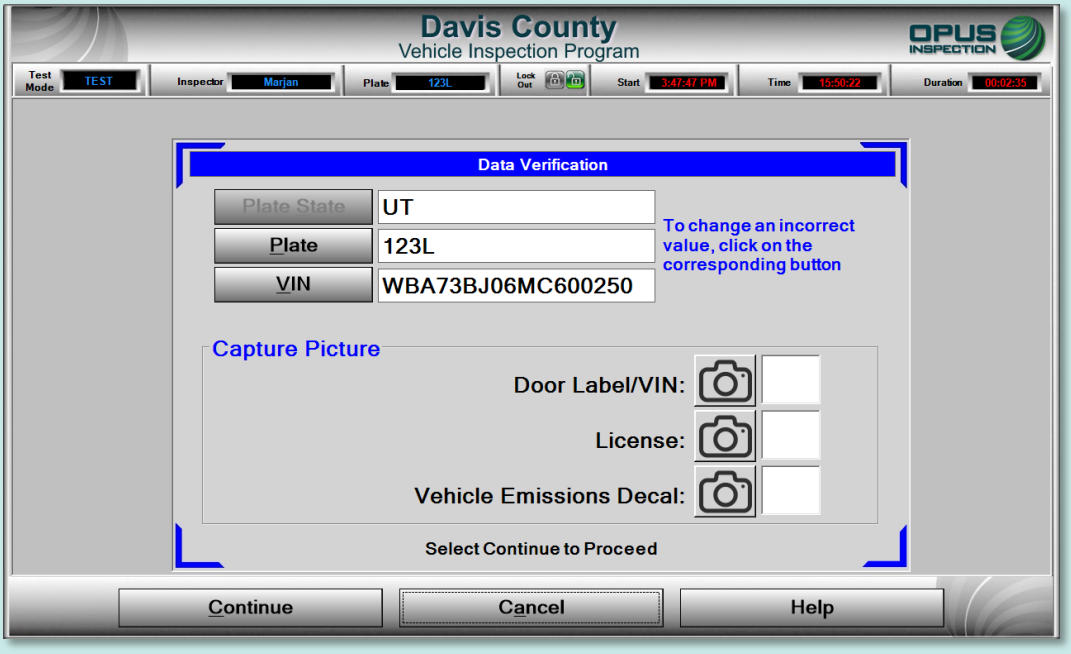


Figure 19: Data verification—prompt to confirm decal present

The next screen (Figure 20) will provide you with the opportunity to change incorrect license plate or VIN information, if necessary. Follow the procedure below to begin taking the required photos.

Figure 20: Data verification—prompt to capture pictures



Taking data verification photos is a two-step process, as described below:

- Using the DriveClean tablet's internal camera, take photos of the vehicle (in this case: license plate, decal, VIN plate) (Figure 21).
- When all required photos have been taken (Figure 22) tap **Continue** to verify the correct assignments on the next screen.

Figure 21: Data verification—positioning the DriveClean camera

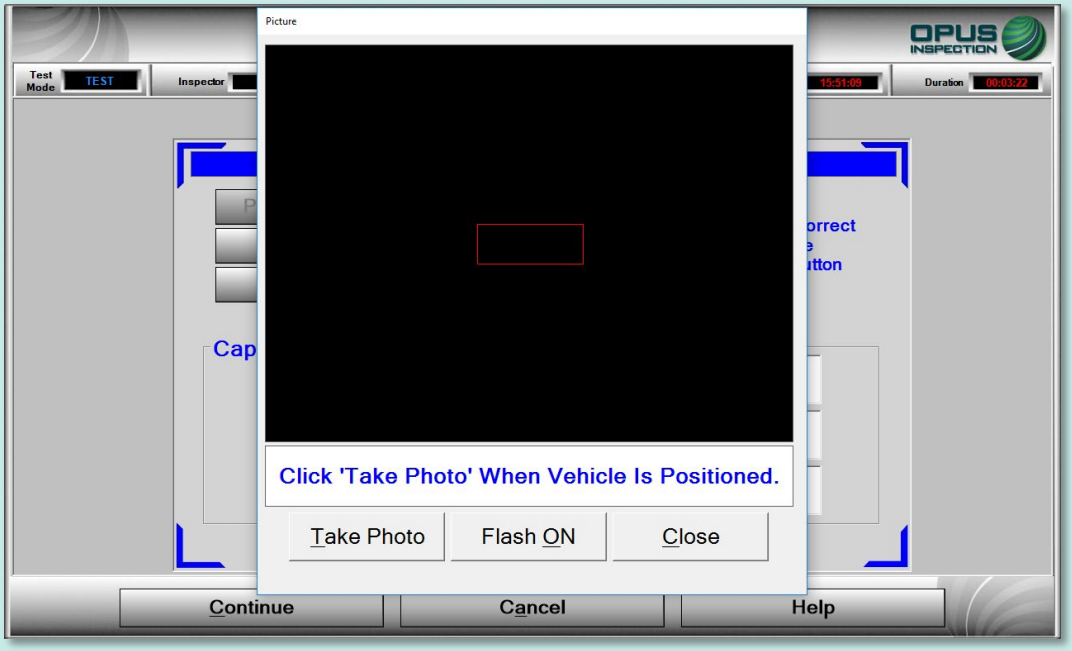
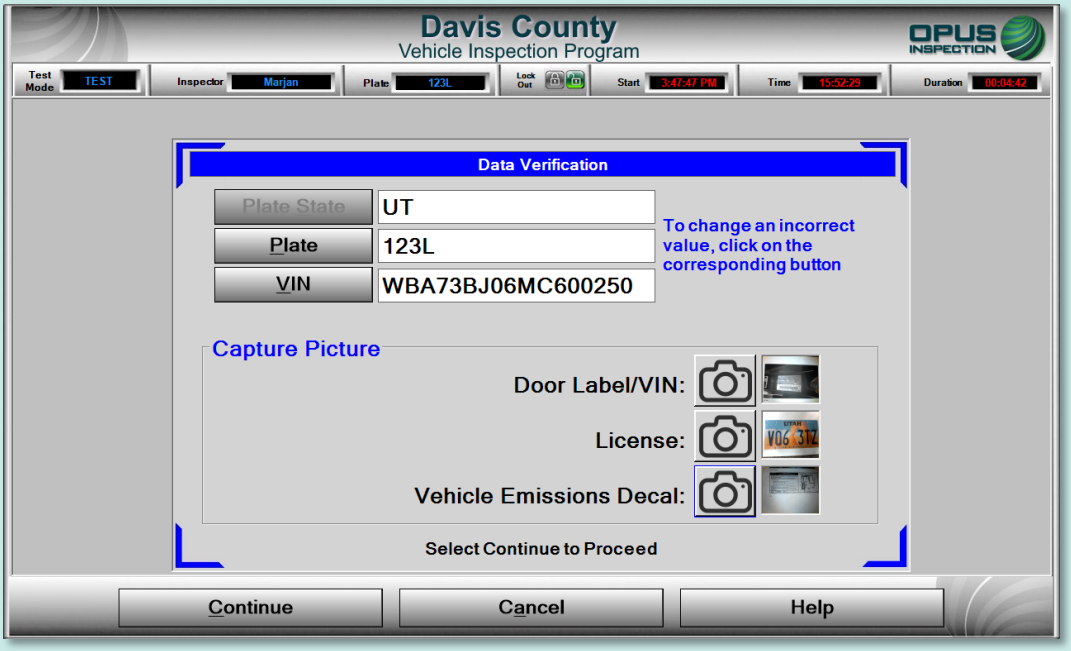


Figure 22: Data verification—Pictures taken and assigned



5.1.5 Vehicle information and vehicle data lookup

Once the VIN has been entered and verified, and mandatory photos captured, the inspection system will request additional vehicle information from the VID. When communication with the VID is complete, the inspection system will display the results and whether the vehicle information and/or previous test data were found.

- If a previous record found notice appears on the **VID lookup** screen (Figure 23), tap **Continue** to view the results (Figure 24), then **Continue** again to continue the inspection. (If previous vehicle information is available, then some of the vehicle information prompts described in the following subsections will be omitted.)
- If no previous record is found, data will be acquired via VIN decode (Figure 25). Tap **Continue** to proceed to additional data entry screens.

Note that in the Figure 24 example, the inspector is alerted to the fact that the vehicle failed the previous inspection.

Figure 23: Previous test lookup/previous test record found

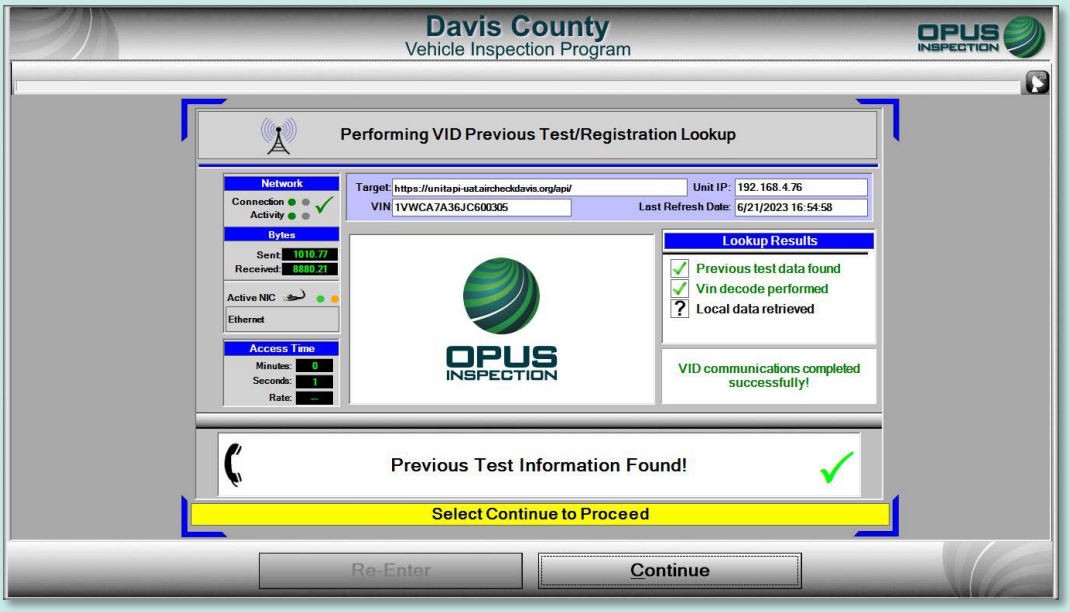


Figure 24: Previous test information

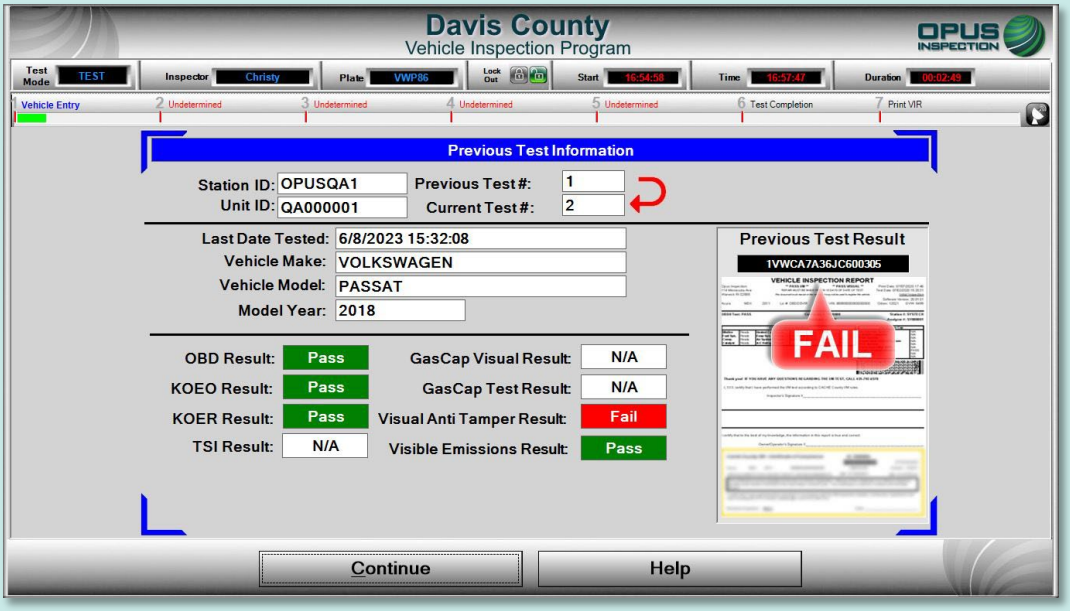
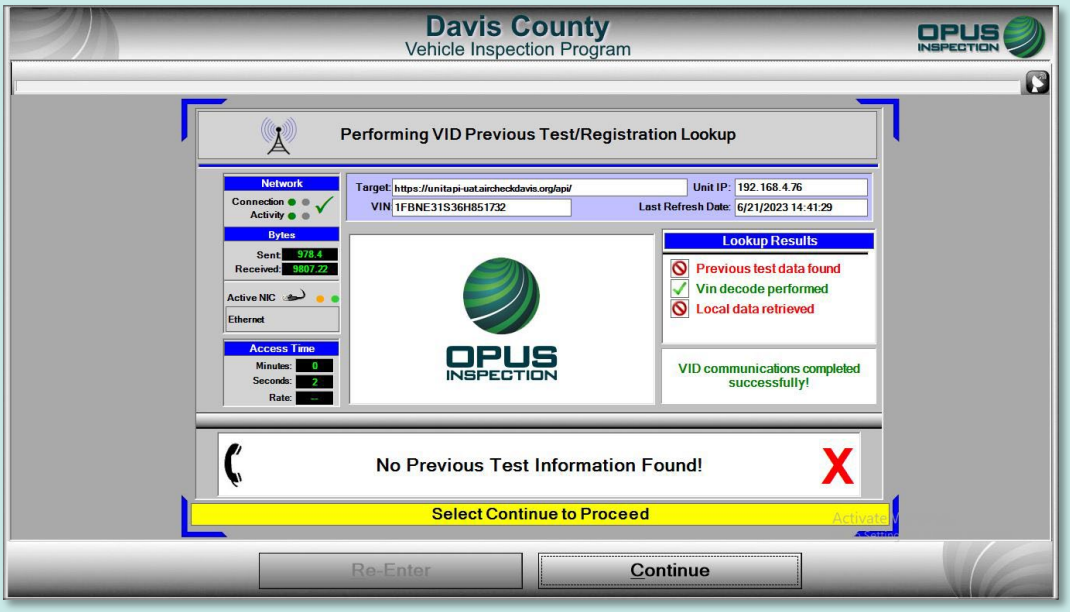


Figure 25: No previous test record/Data located from VIN decode



In circumstances where vehicle data lookup finds no previous data, a VIN decode was unable to be performed, and no local data was retrieved, the screen will deliver the following message:

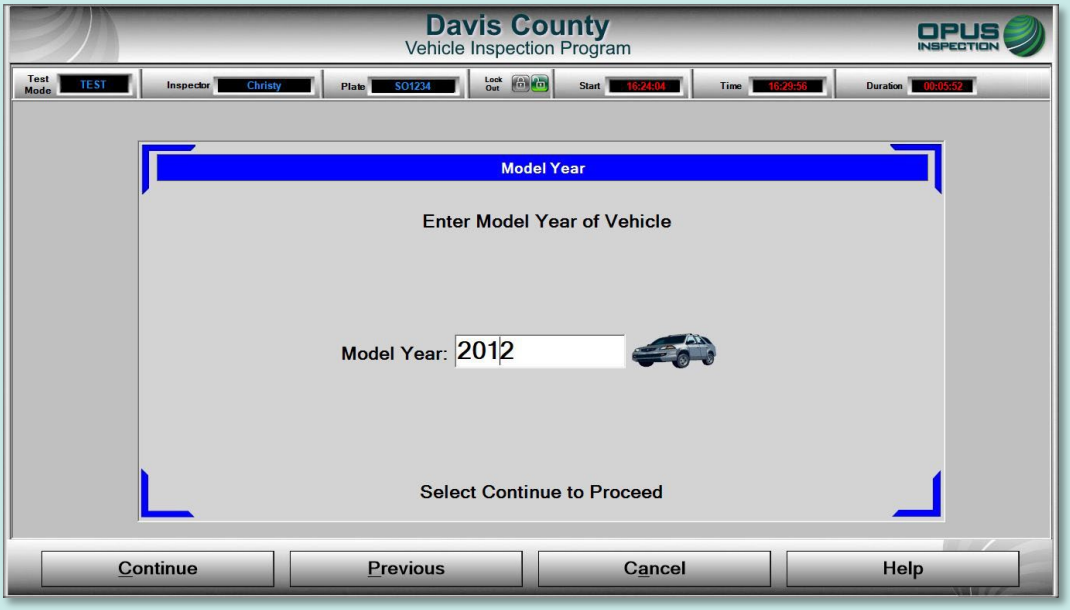
No matching data found! Is VIN correct?

In addition, the screen will notify you that manual entry of vehicle parameters is required. You may choose to tap **Re-Enter** to correct the VIN error or tap **Continue** to proceed with the inspection.

5.1.6 Vehicle model year entry

On the model year screen (Figure 26) enter the vehicle's model year in the field provided, then tap **Continue**.

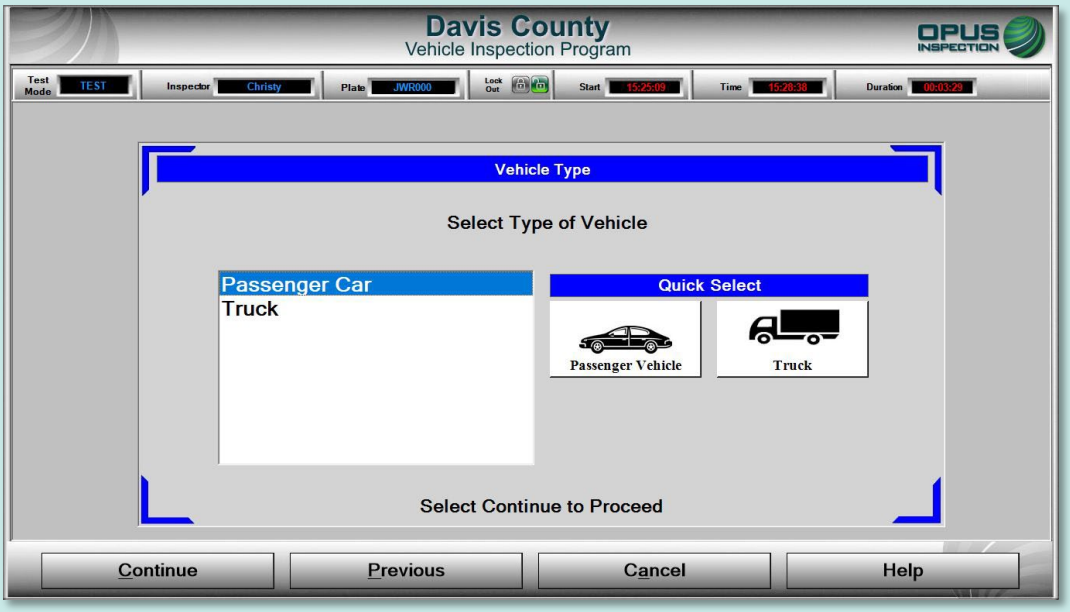
Figure 26: Enter model year of vehicle



5.1.7 Vehicle type entry

In the **Vehicle Type** screen (Figure 27), enter the type of vehicle by selecting **Passenger Car** or **Truck** in the left-side field or by tapping the appropriate icon under the **Quick Select** header. Tap **Continue** when finished.

Figure 27: Enter vehicle type

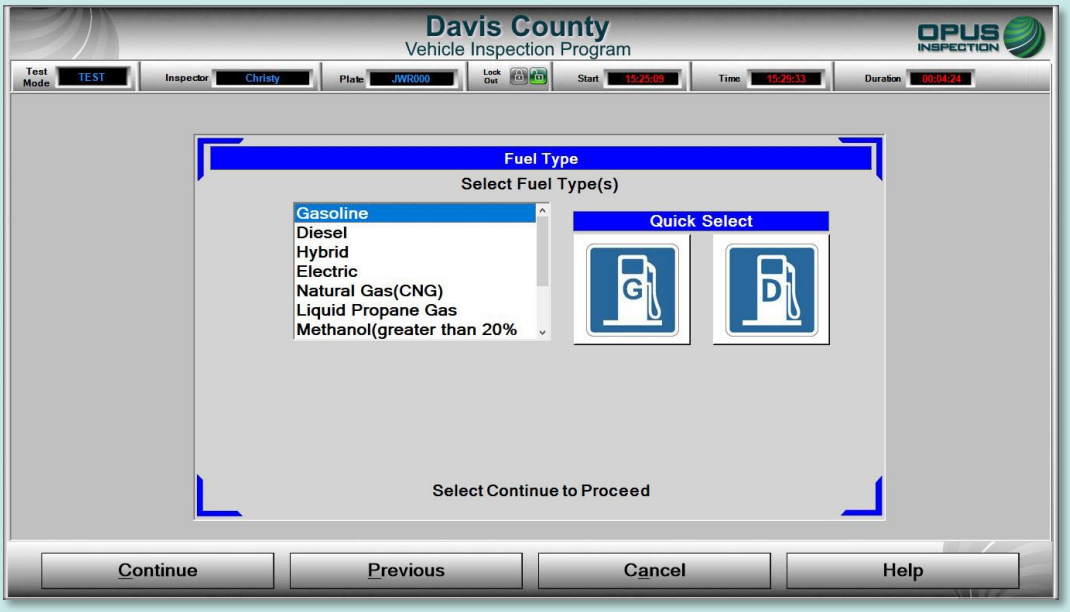


5.1.8 Fuel type entry

In the **Fuel Type** screen (Figure 28), select the vehicle's fuel type from the list at the left-side of the screen or tap the appropriate icon under the **Quick Select** header, then **Continue**.

Note that a third field is available for entering data for vehicles that are bi-fuel capable. You may be prompted with a pop-up box to confirm the vehicle's bi-fuel status.

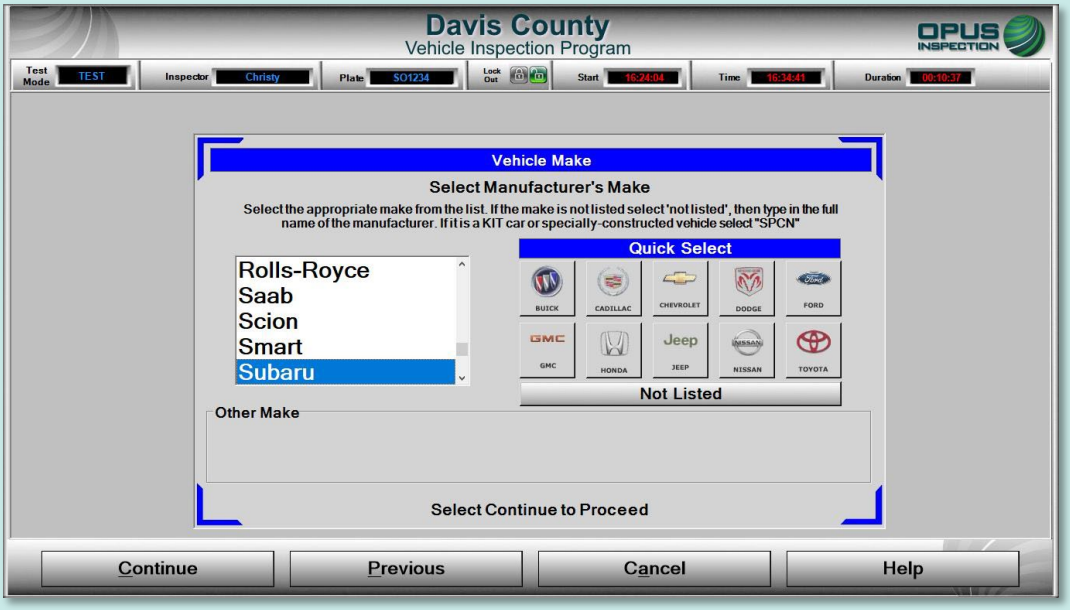
Figure 28: Select fuel type



5.1.9 Vehicle make entry

On the **Vehicle Make** screen (Figure 29), select vehicle make from the scrollable list on the left side of the screen or from the **Quick Select** icons on the right. Tap **Continue** to proceed. If the vehicle's make is not listed, tap **Not Listed** under the **Quick Select** icons. A field will appear for manually entering the vehicle make.

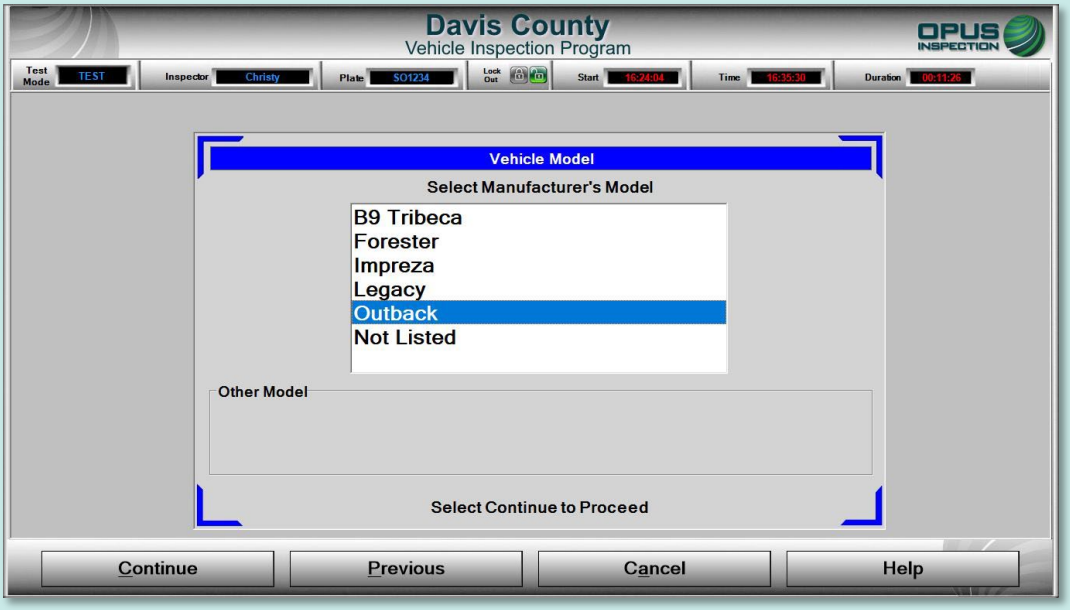
Figure 29: Select vehicle make



5.1.10 Vehicle model entry

From the **Vehicle Model** screen (Figure 30), select the vehicle's model from the scrollable list, then tap **Continue**.

Figure 30: Enter vehicle model



5.1.11 Additional manual entry screens

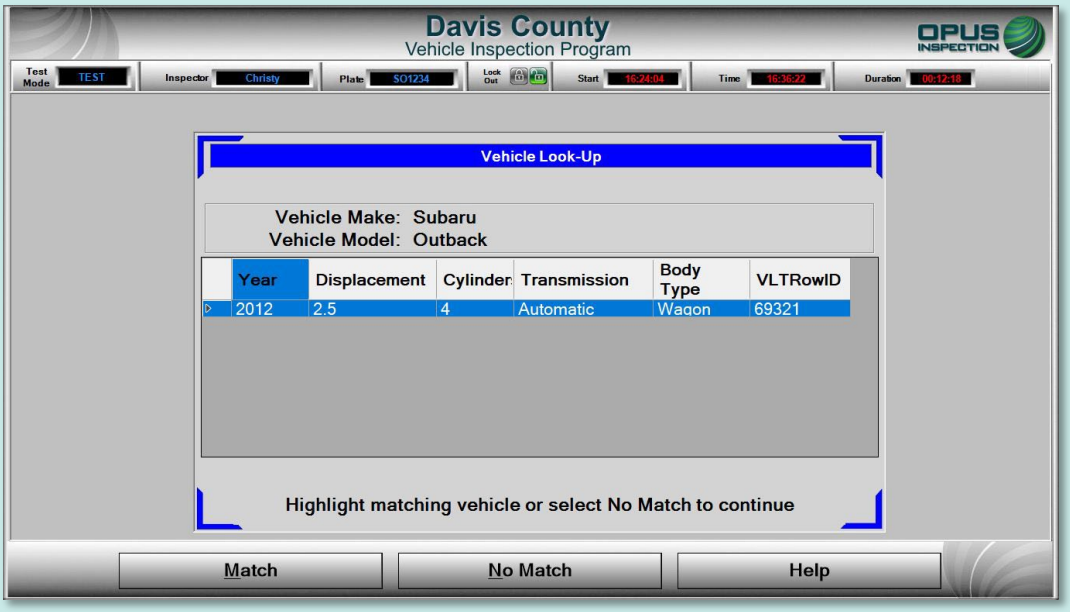
For those vehicles where vehicle data is unavailable from lookup tables, additional manual entry of vehicle parameters may be required. As necessary, you will be stepped through entry of engine displacement, number of engine cylinders, transmission type, vehicle body style, and the odometer reading. Tap **Continue** to proceed to the next step in the inspection process or **Previous** to access the prior screen.

5.1.12 Vehicle lookup table match selection

The **Vehicle Look-Up** screen (Figure 31) displays the vehicle's make, model, year, displacement, number of cylinders, transmission type, body type, and vehicle lookup table (VLT) row ID. If the information displayed matches the vehicle under test, tap **Match** to continue with the inspection process.

If the information displayed on the screen does not match, tap **No Match**. You will be prompted through a series of screens to enter the vehicle data manually.

Figure 31: Vehicle lookup and match screen



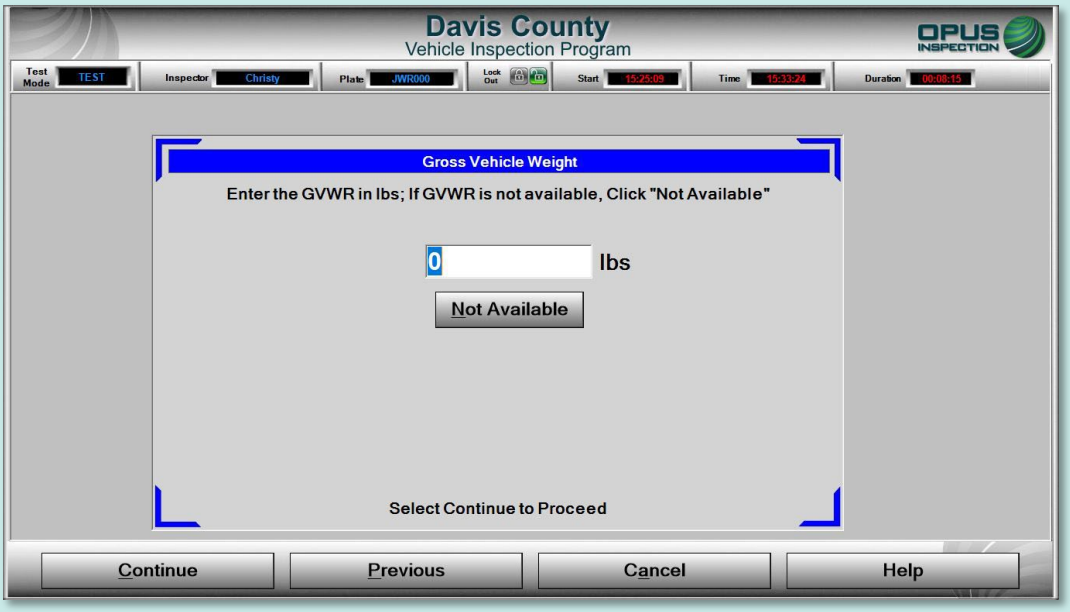
5.1.13 Vehicle weight class entry

On the **Gross Vehicle Weight** screen (Figure 32), enter the vehicle's gross vehicle weight. If the gross vehicle weight is not available, tap **Not Available** and the inspection system will fill in the field with a default number (5999). Tap **Continue** to proceed with the inspection.

The GVWR is typically located near the vehicle's VIN—that is, on the driver's side doorjamb or under the hood.

Some vehicles requiring manual entry of data will cause additional instructions to pop up when you tap **Not Available.** These instructions will direct you to enter a default weight number depending on the vehicle make, model, or other parameters.

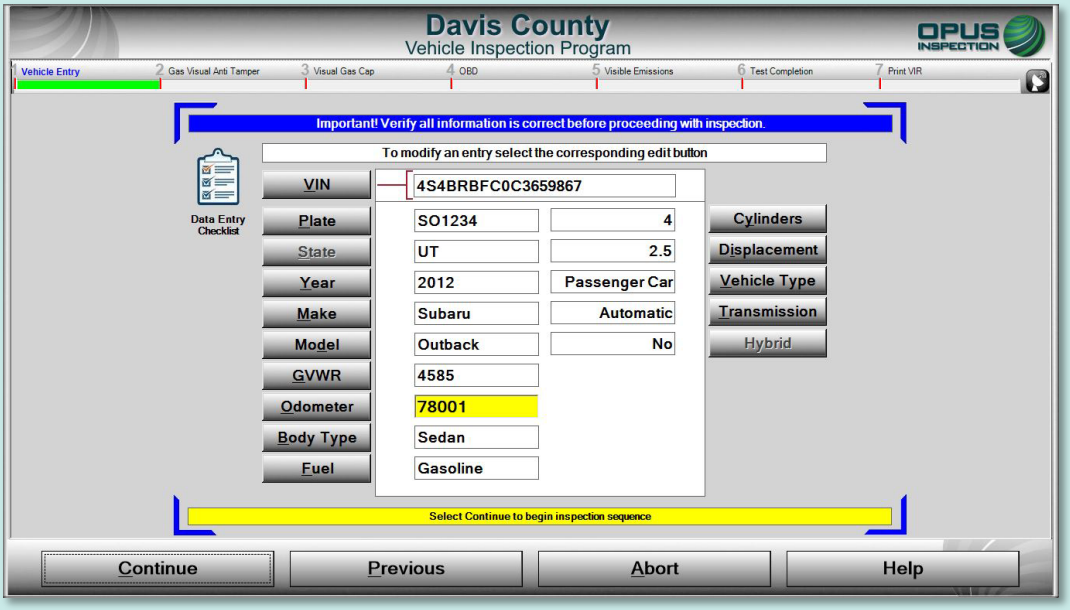
Figure 32: Enter gross vehicle weight



5.1.14 Verify information and enter odometer reading

The **Verify all information** screen (Figure 33) provides a data entry checklist. Review each entry carefully before tapping **Continue**. If it has not yet been recorded, enter the **Odometer** reading in the field provided. Also, correct any errors that appear in the data fields shown on the screen by tapping on the button to the left or right of the appropriate data field.

Figure 33: Verify all information screen



5.1.15 Visual anti-tampering inspection

The visual anti-tampering inspection process for gasoline and diesel vehicles involves visually confirming the presence of mandatory components (catalytic converter and O_2 sensor) and other emissions-related devices.

As with the data verification process (see section 5.1.4), taking photos for documenting anti-tampering compliance is a two-step process, as described below:

- Using the DriveClean tablet's internal camera, take photos of the required devices.
- When all required photos have been taken tap **Continue** to verify the devices on the next screen. Use the buttons on the screen to assign the different photos to the correct description (Figure 34). At the completion of the visual anti-tampering inspection process, answer all questions on the inspection screen (Figure 35) and tap **Continue**.

After the visual anti-tampering inspection process has been completed, the photos will automatically be deleted from the DriveClean camera.

Figure 34: Data verification—Prompt to verify devices and assign photos

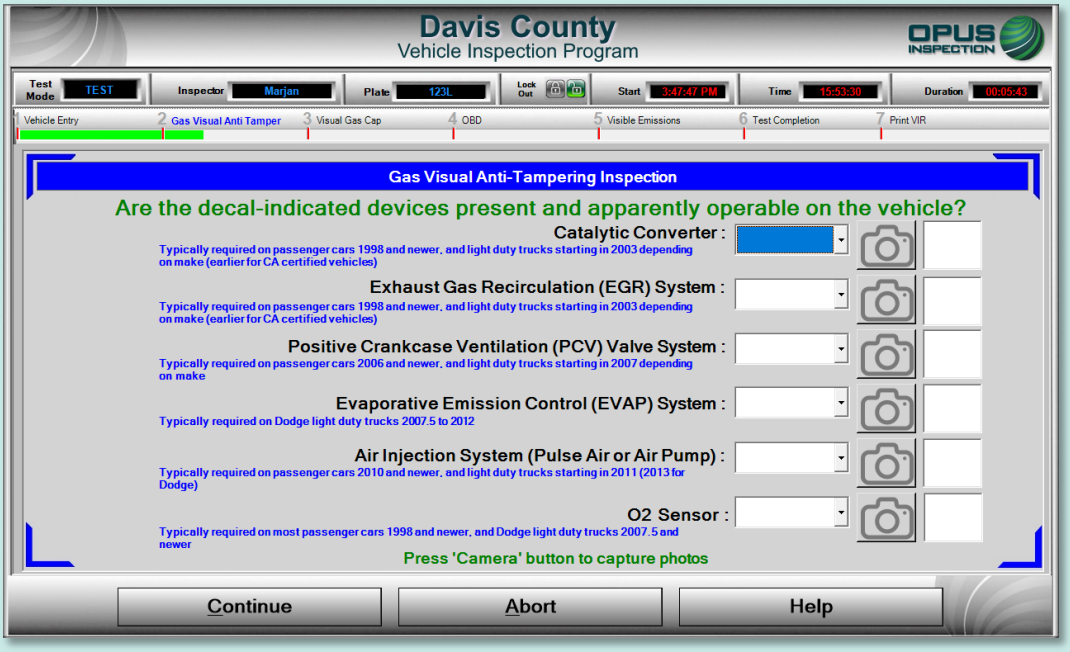
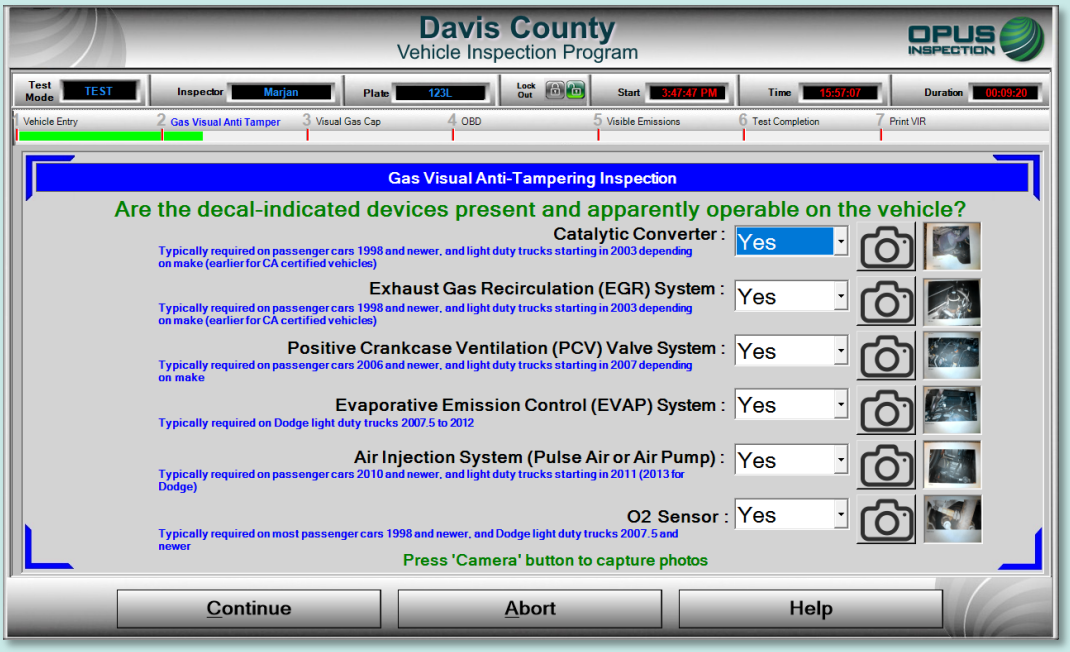


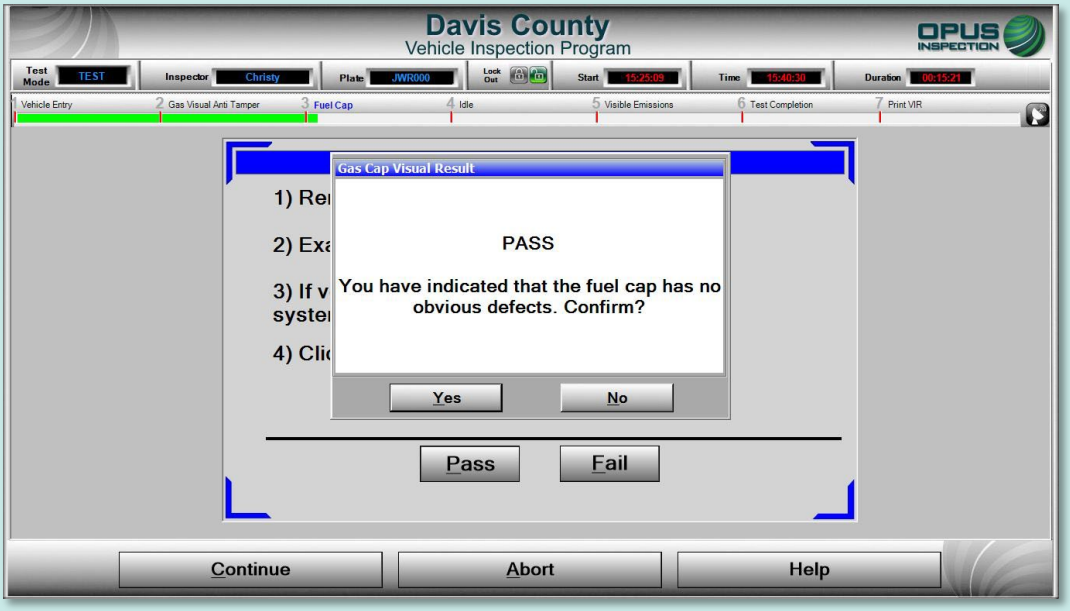
Figure 35: Data verification—Visual anti-tampering inspection completed



5.1.16 Gas cap visual inspection

The gas cap visual inspection process follows the visual anti-tampering inspection. The screen (Figure 36) will walk you through the process.

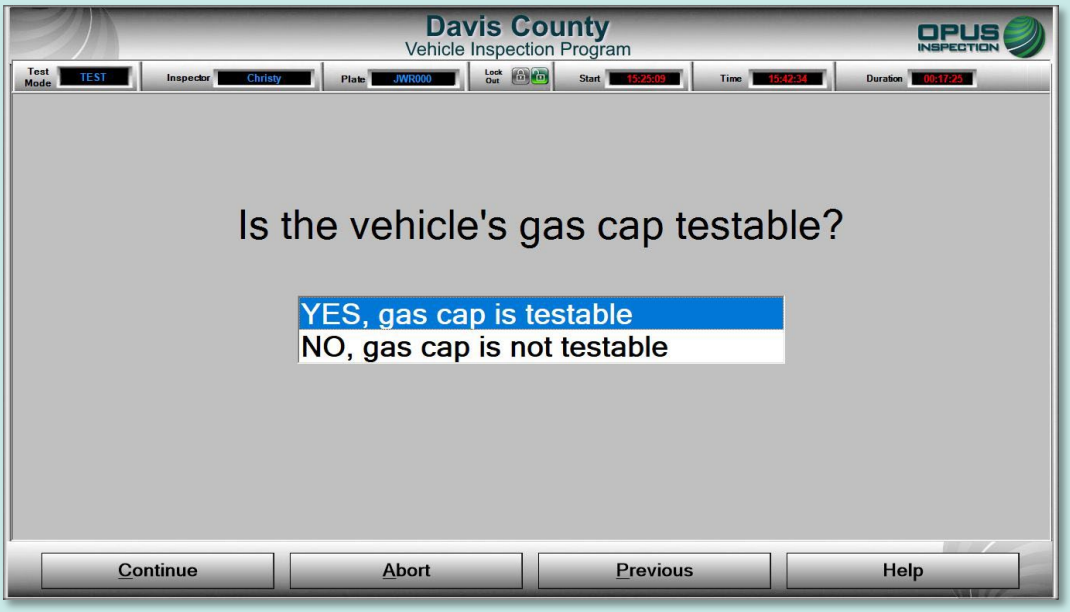
Figure 36: Gas cap visual inspection—Prompt to confirm pass



Two additional questions, as seen in (Figure 37) and (Figure 38), need to be answered before proceeding to the gas cap pressure test.

Figure 37: Gas cap visual inspection—Prompt to determine if gas cap is missing

Figure 38: Gas cap visual inspection—Prompt to determine if gas cap is testable



5.1.17 Gas cap pressure test

Follow the instructions on the screen (Figure 39) for connecting the correct adapter and running the gas cap pressure test. When a passing test has been completed, you will be prompted to be sure to remove the adapter and replace the vehicle's gas cap (Figure 40). Tap **Continue** to proceed.

Figure 39: Gas cap pressure test—Prompt to attach adapter

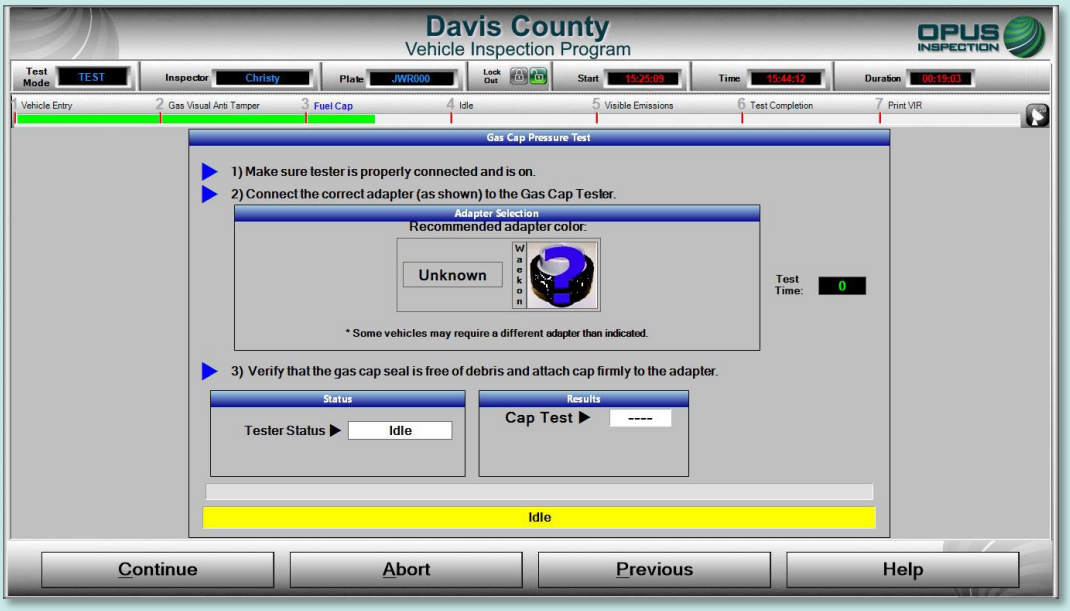
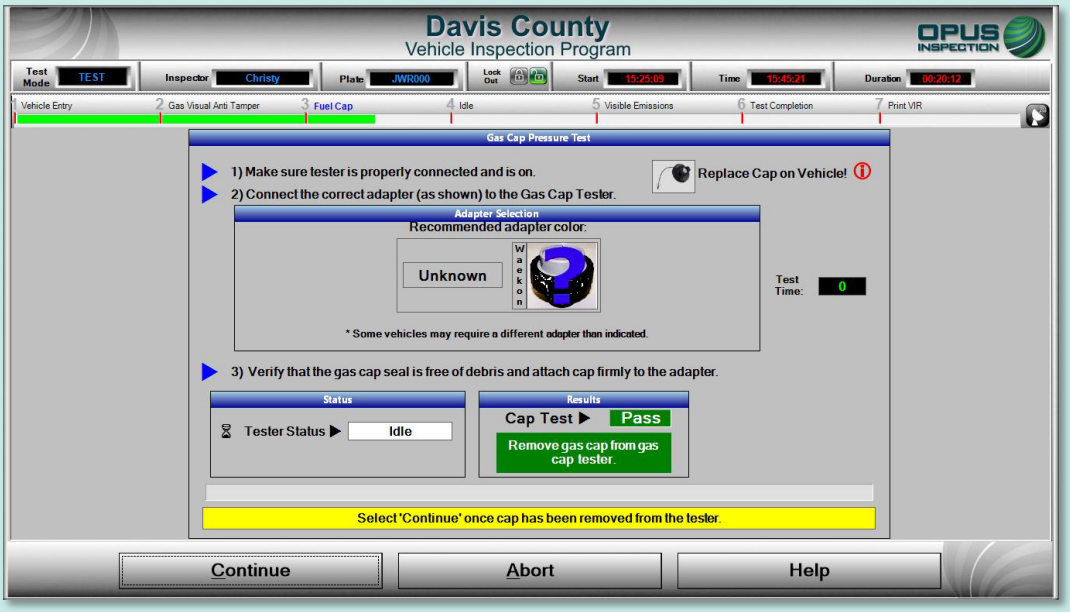
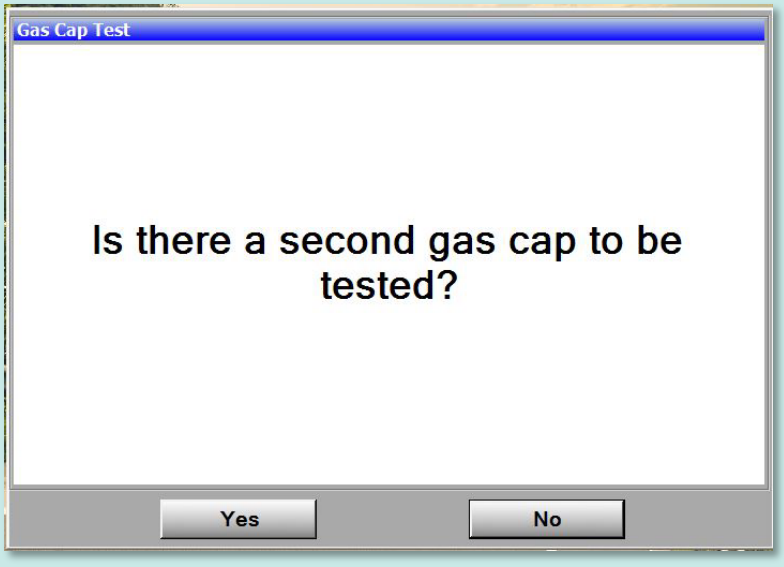


Figure 40: Gas cap pressure test—Passing test, prompt to remove adapter



Following the gas cap pressure test, you will be prompted to determine if a second gas cap needs to be tested (Figure 41). Tap **Yes** to repeat the gas cap pressure test for the second gas cap or **No** to continue to the next step in the vehicle inspection process.

Figure 41: Gas cap pressure test—Prompt for second gas cap



5.1.18 MIL lamp status

On the **OBD Dashboard MIL (Check Engine) light verification** screens, follow the directions for **KOEO** (Figure 42) and **KOER** (Figure 43) checks, selecting **Yes** or **No** depending on the outcome. The inspection system will proceed to the next screen following the **KOER** check.

Figure 42: OBD Dashboard MIL Verification-KOEO

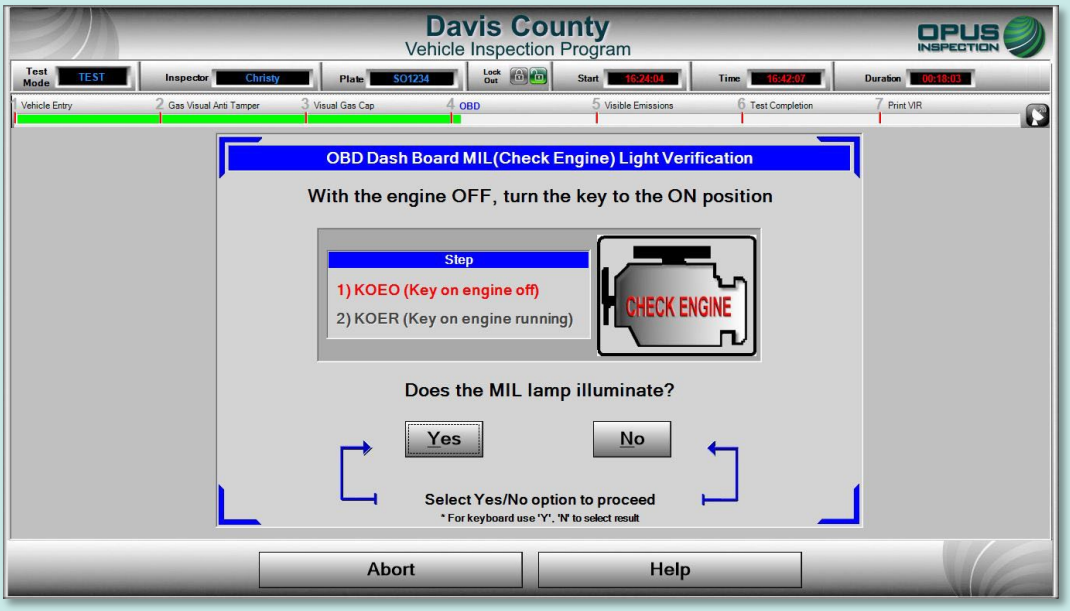
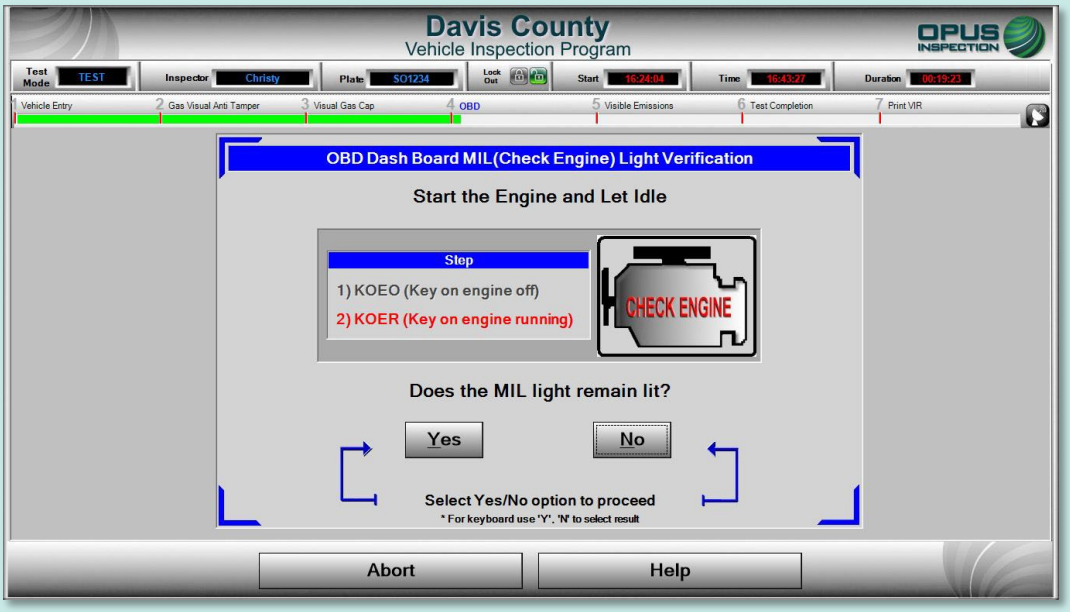


Figure 43: OBD Dashboard MIL Verification-KOER



5.1.19 Visible emissions check

On the **Visible Emissions Check** screen (Figure 44), indicate whether the vehicle produced visible emissions by selecting **Yes** or **No.** A pop-up box will appear prompting for confirmation (Figure 45). When confirmed, tap **Continue** to proceed to the final step in the inspection process. (A **Yes** answer to the visible emissions question will result in a failed inspection regardless of the outcome of the OBD test.)

Figure 44: Visible emissions check

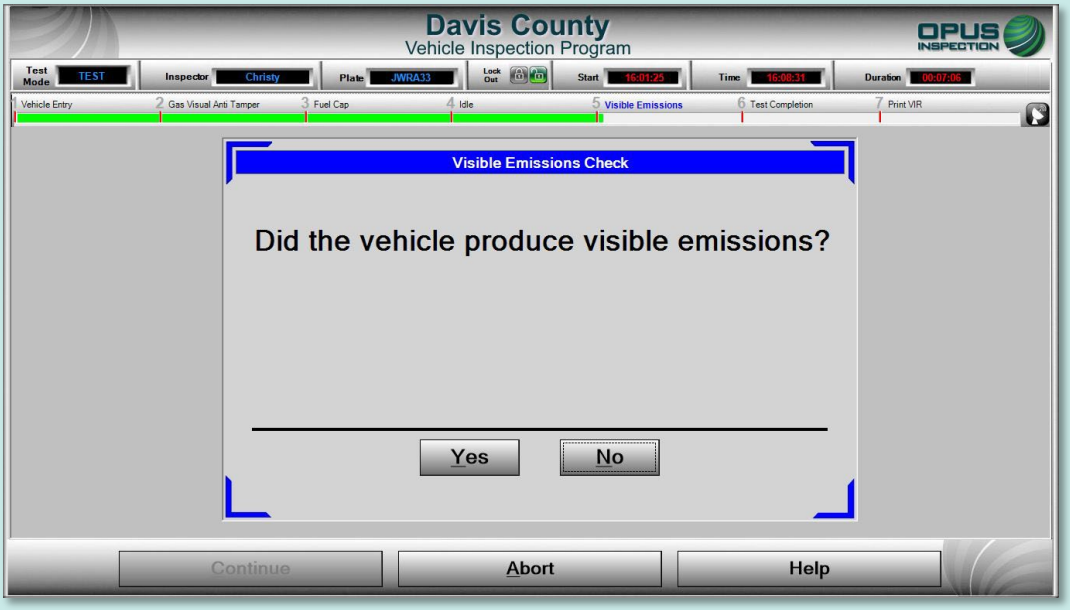
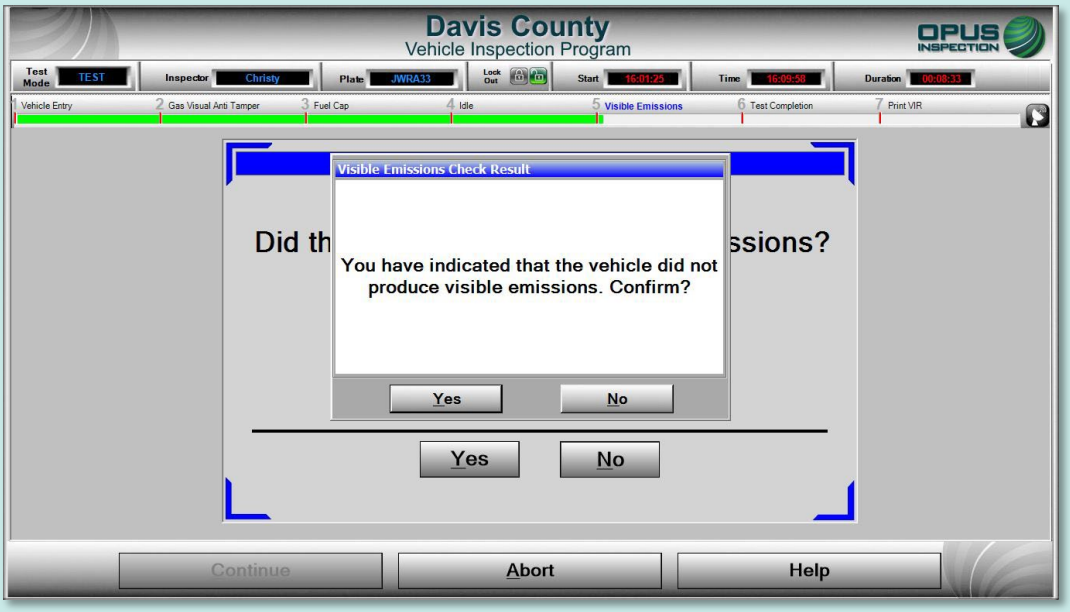


Figure 45: Visible emissions check—Confirm Yes or No



5.1.20 Printing the vehicle inspection report (VIR)

The final screen displays a copy of the **vehicle inspection report** (VIR) of the inspection result. The VIR is automatically sent to the printer.

The examples below depict a vehicle that has passed both the I/M and visual inspections (Figure 46) and one that failed the I/M portion of the inspection but passed the visual (Figure 47).

To print a second copy of the VIR, tap **Reprint Form**. To conclude the inspection process, tap **Continue**. The inspection system display will return back to the **Vehicle Inspection Menu**.

Figure 46: Vehicle Inspection Report (VIR)—Passing result

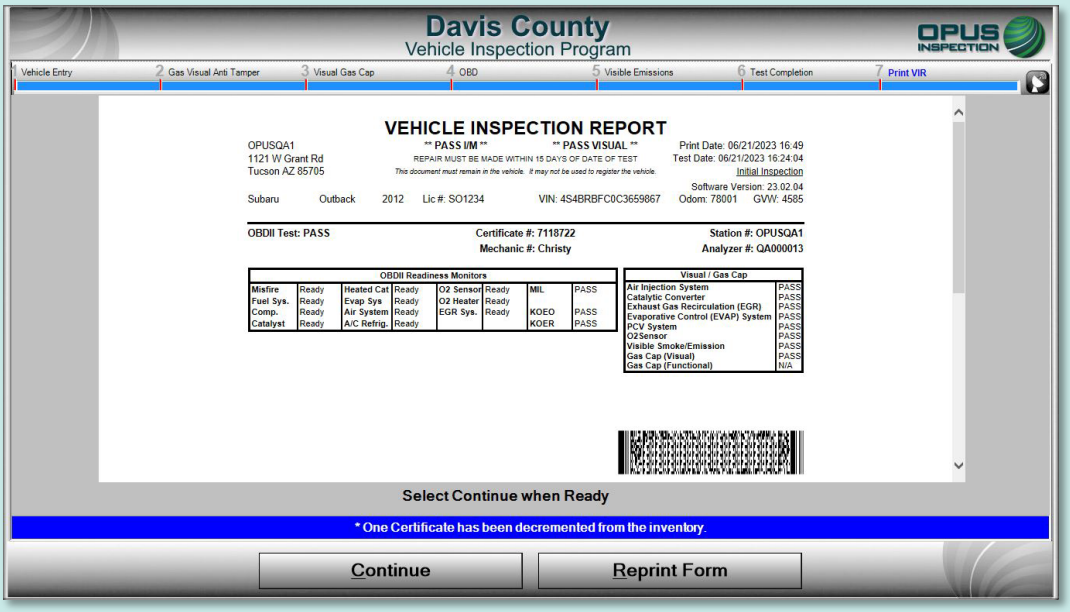
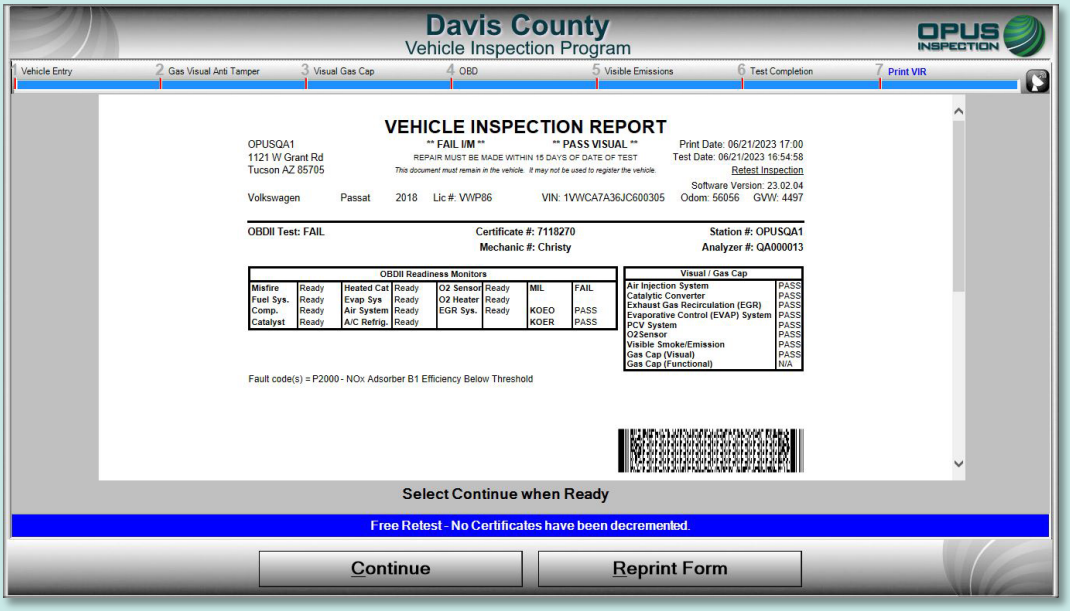


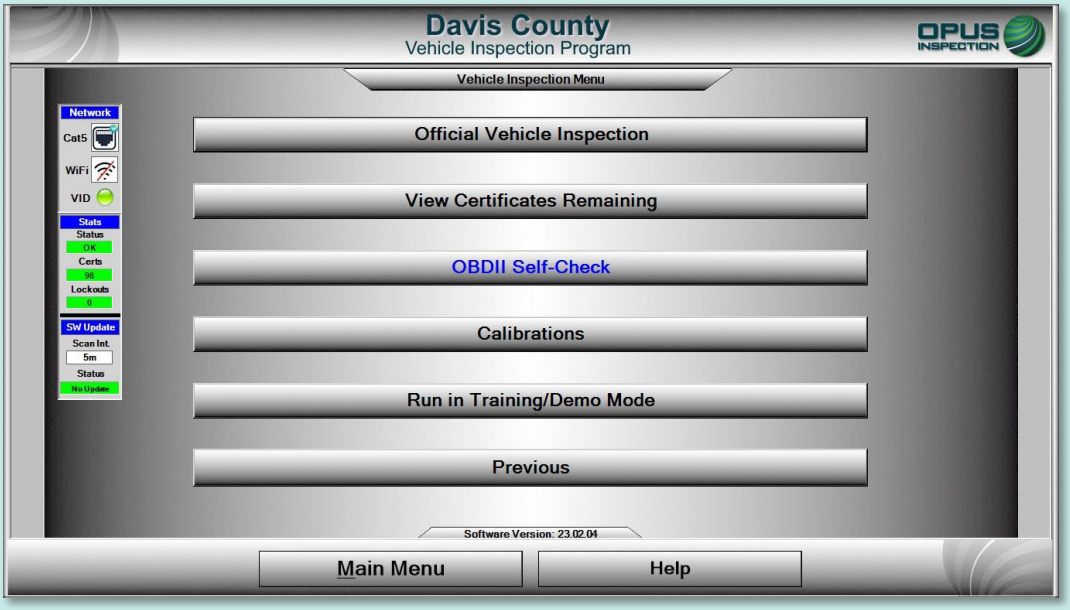
Figure 47: Vehicle inspection report (VIR)—Failed I/M but passed visual



5.2 Other vehicle inspection menu items

Besides the **Official Vehicle Inspection**, the **Vehicle Inspection Menu** (Figure 48) includes several additional utilities, as described in the subsections below.

Figure 48: Vehicle inspection menu



5.2.1 View certificates remaining

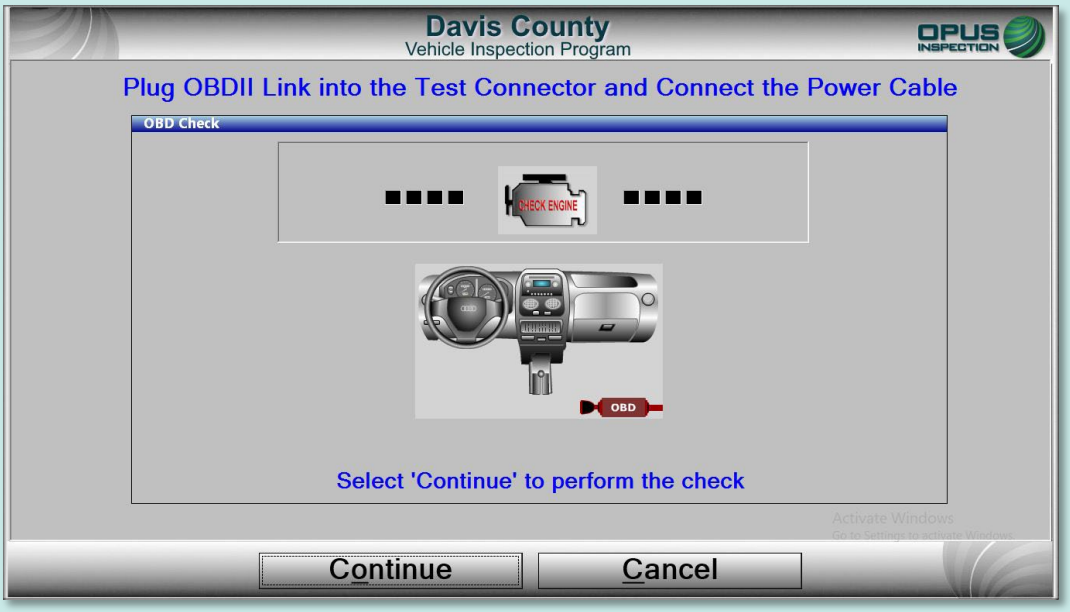
Tapping **View Certificates Remaining** provides a quick check of available stock (Figure 49).

Figure 49: Certificates remaining

5.2.2 OBD self-check

The **OBD Self-Check** function (Figure 50) offers a method to check the System's OBD link. Follow the instructions on the screen and tap **Continue.** Tap **OK** when the check has been completed to return to the Vehicle Inspection Menu.

Figure 50: OBD Self-check



5.2.3 Calibrations

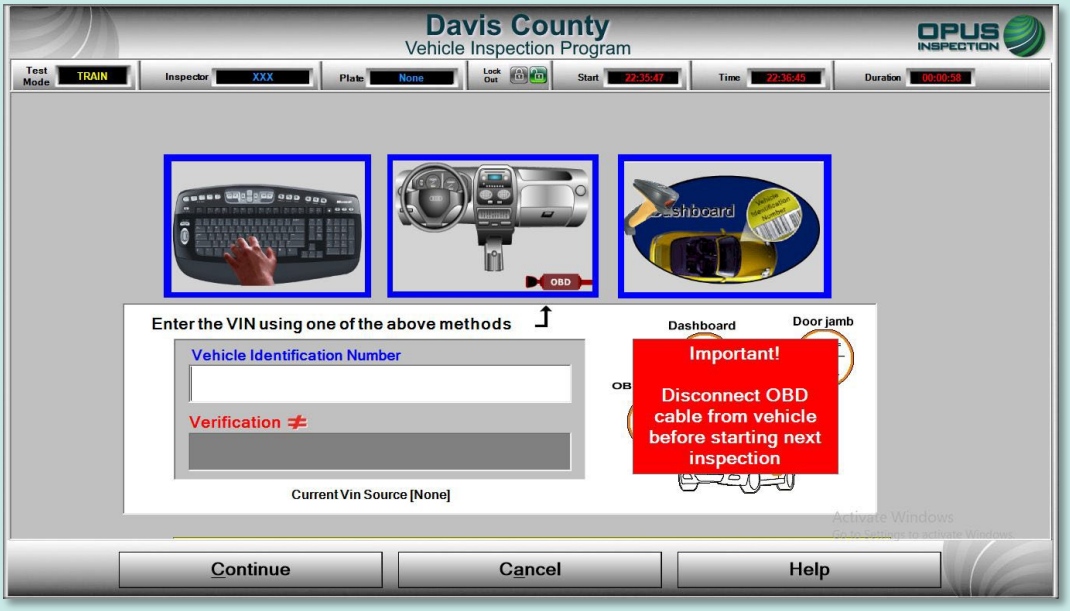
No calibrations are necessary for the OBD-only DriveClean tablet inspection system. While this menu item is applicable to Gen3 TSI/OBD-II Systems, it may be disregarded for the OBD-only DriveClean tablet.

5.2.4 Running in Training/Demo mode

The inspection system provides users with the ability to run inspections in **Training/Demo Mode**. Training/demo mode emulates the official inspection process and connects with the VID, though no test results are recorded or reported.

Note in the example in Figure 51, **TRAIN** appears in **Test Mode** window on the dashboard at the top left of the screen.

Figure 51: Running inspection in training mode (enter plate number)



5.2.5 Previous

Tapping **Previous** from the **Vehicle Inspection Menu** returns the user to the **Main Menu**.

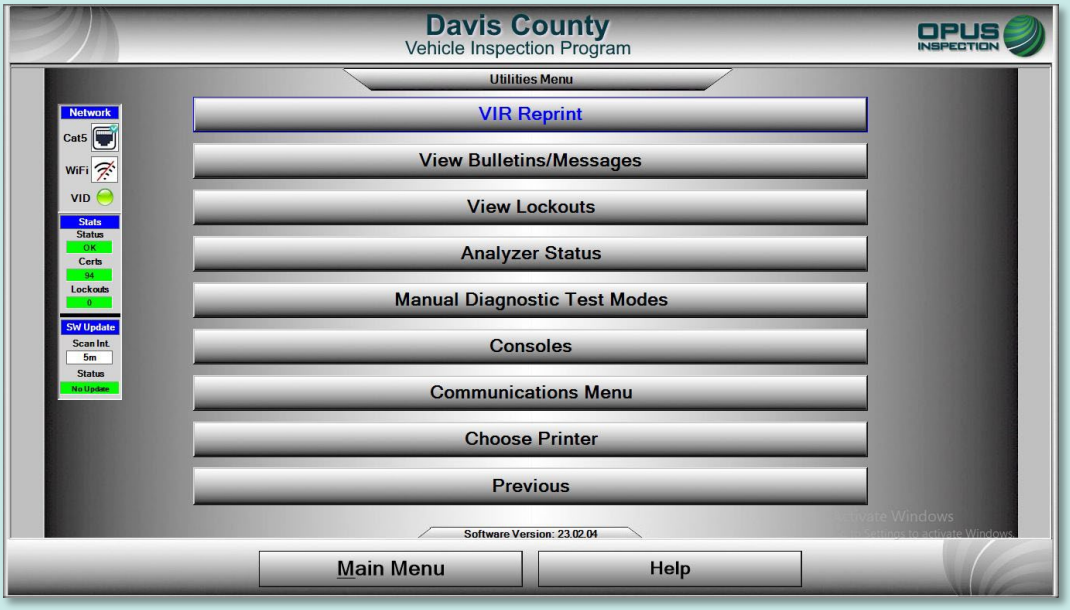
6.Utilities menu

The **Utilities Menu** (Figure 52) includes a variety of useful functions, such as:

- VIR reprint
- View bulletins and messages
- View lockouts
- Analyzer status
- Manual diagnostic test mode
- Consoles
- Communications menu
- Choose printer
- Previous

Each utility is described in a subsection below.

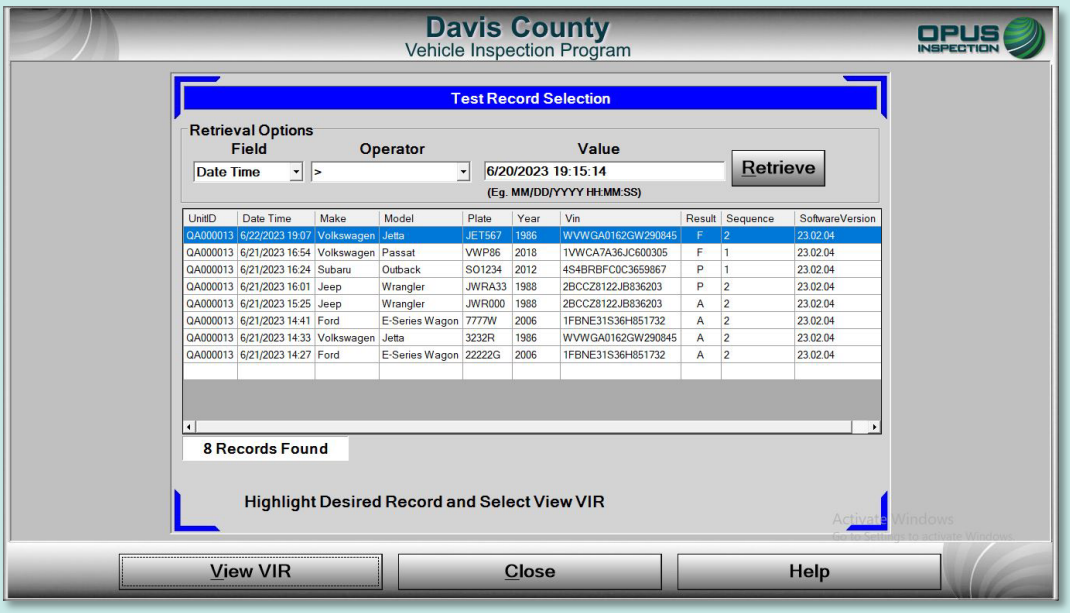
Figure 52: Utilities menu



6.1 VIR reprint

From the **Utilities Menu**, tap **VIR Reprint** to bring up a list of test records (Figure 53), searchable by date/time and operator, from which a VIR can be viewed and printed.

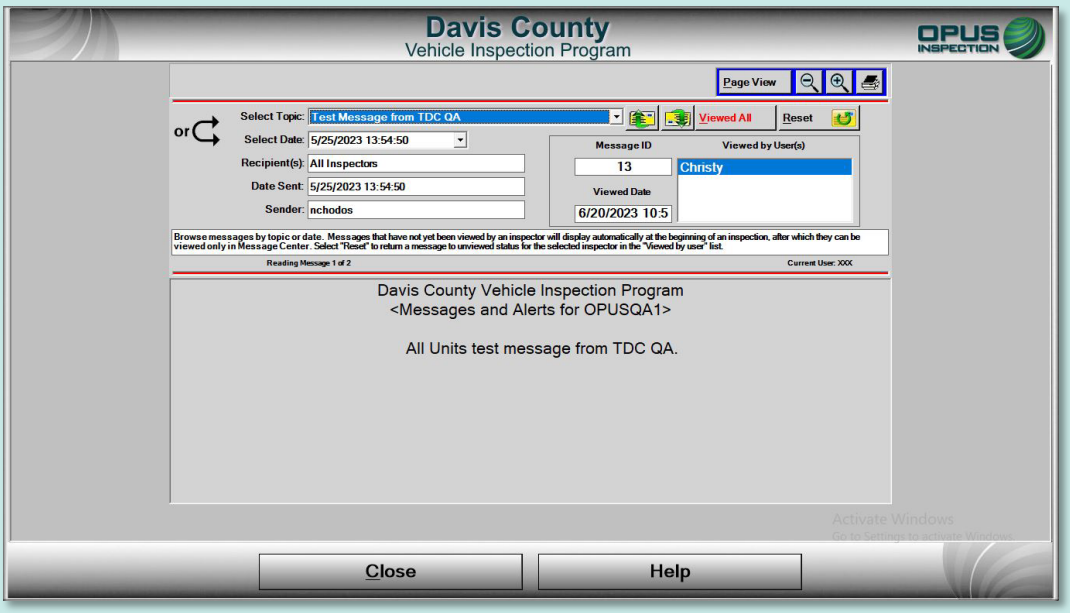
Figure 53: Utilities—VIR reprint



6.2 Viewing bulletins and messages

Tap Bulletins/Messages to bring up a screen (Figure 54) providing searchable parameters and several message-handling functions.

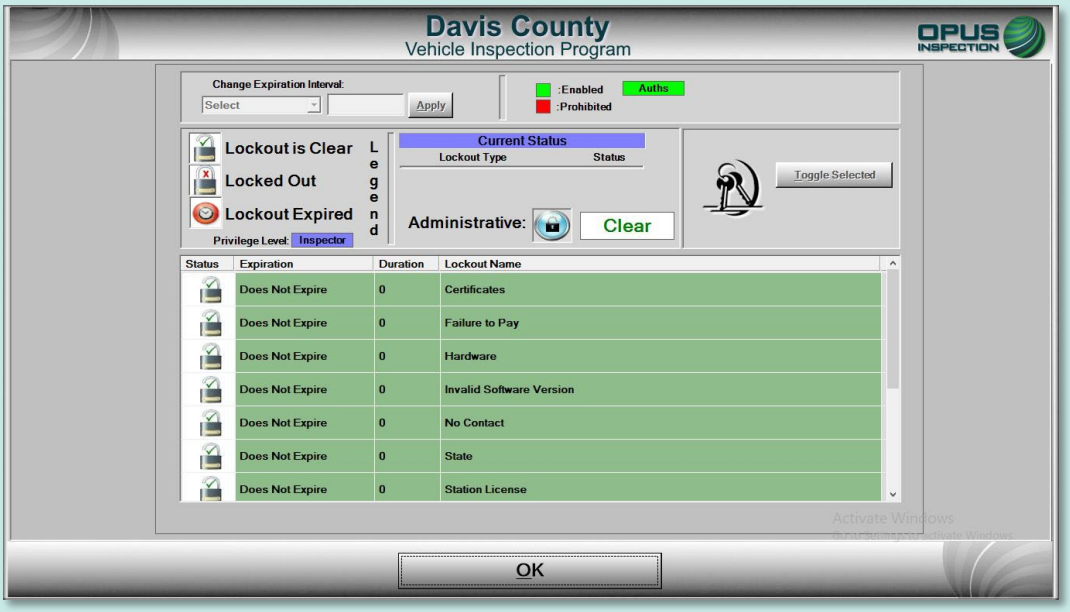
Figure 54: Utilities—View bulletins and messages



6.3 Viewing lockouts

Lockouts impact your ability to perform inspections. Most lockouts are due to lack of certificates or a result of administrative actions. Tap **View Lockouts** to display a screen (Figure 55) of lockouts and their current status. You can scroll down to see additional lockouts.

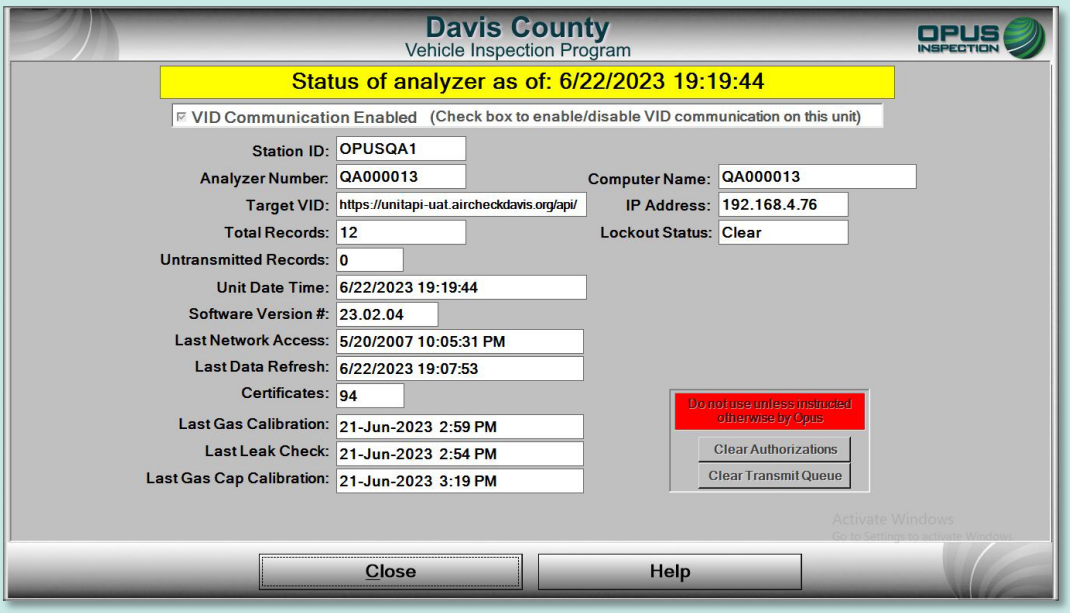
Figure 55: Utilities—View lockouts



6.4 Analyzer status

The Analyzer status screen (Figure 56) provides a quick snapshot of relevant analyzer functions useful for troubleshooting, viewing calibration status, data communications, and more.

Figure 56: Utilities—Analyzer status



6.5 Manual diagnostic test modes

Tapping the **Manual Diagnostics Test Mode** option enables the user to run OBD or gas test modes that are not part of an official or training/demo inspection. No records are retained; this function is for diagnostic purposes only.

Figure 57 displays a menu of test modes. You will be prompted for additional vehicle details in subsequent screens (see Figure 58 for OBD, disregard for Gas). At any time, tap **Help** to access operator documentation.

Figure 57: Utilities—Diagnostic test mode

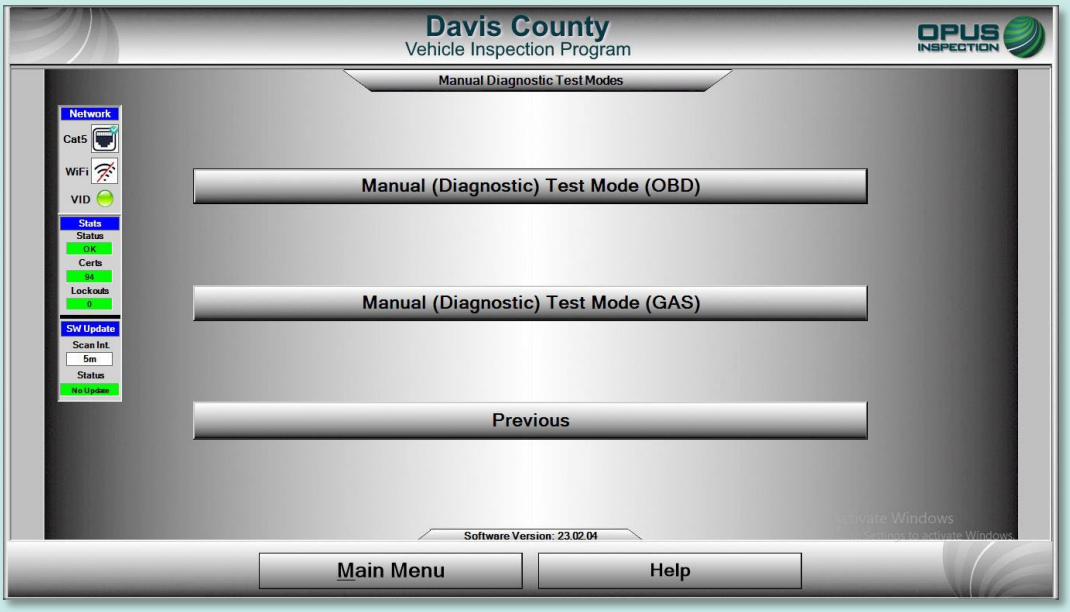
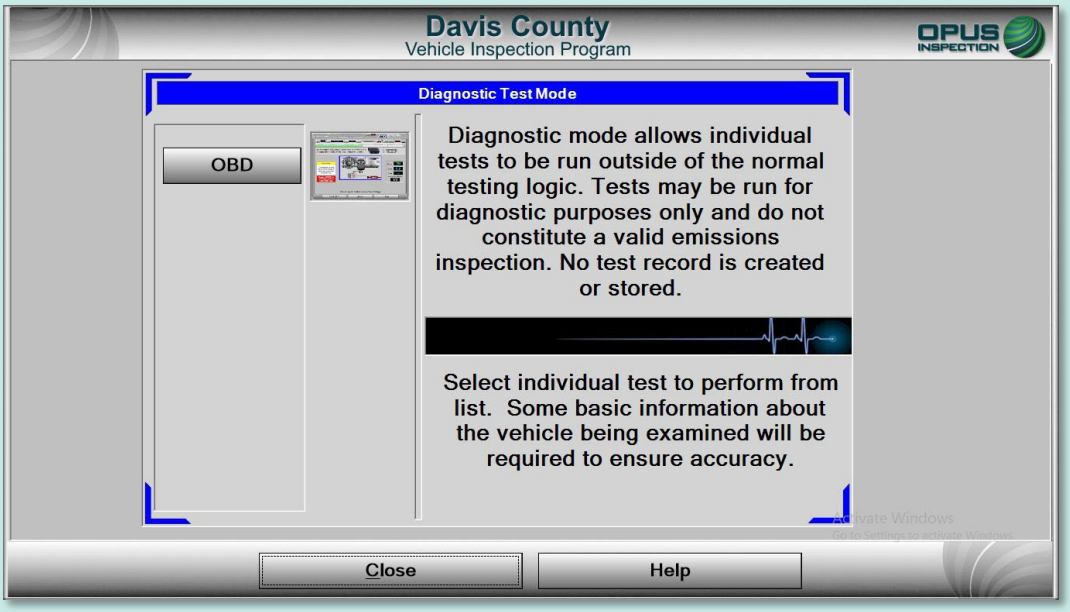


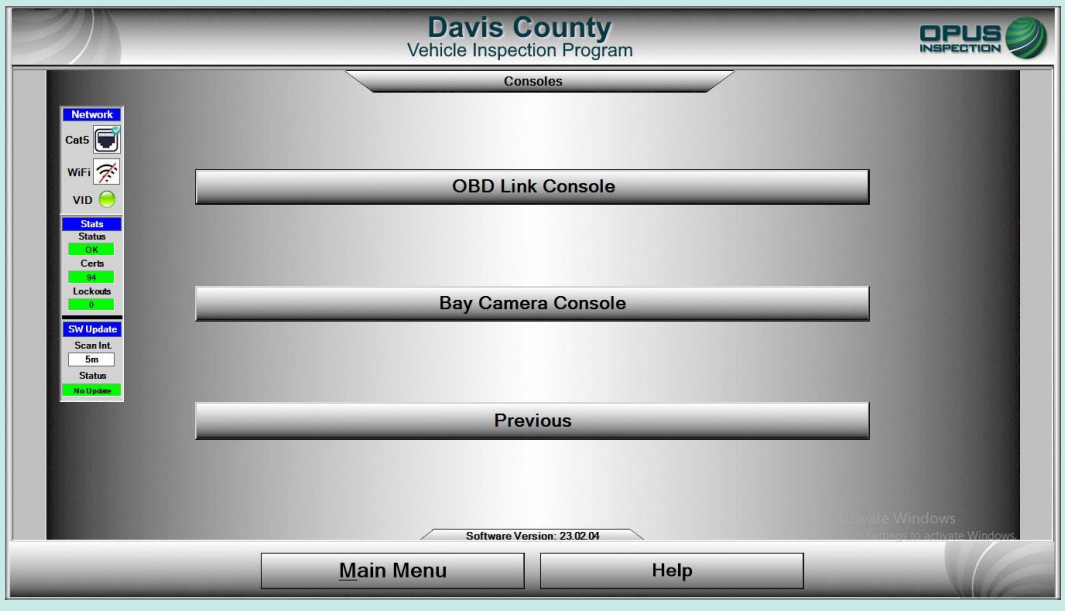
Figure 58: Utilities—OBD manual diagnostic test mode



6.6 Consoles

The **Consoles** menu (Figure 59) provides access to the **OBD link Console** and the **Bay Camera Console** cameras for diagnostic purposes.

Figure 59: Utilities—Consoles menu

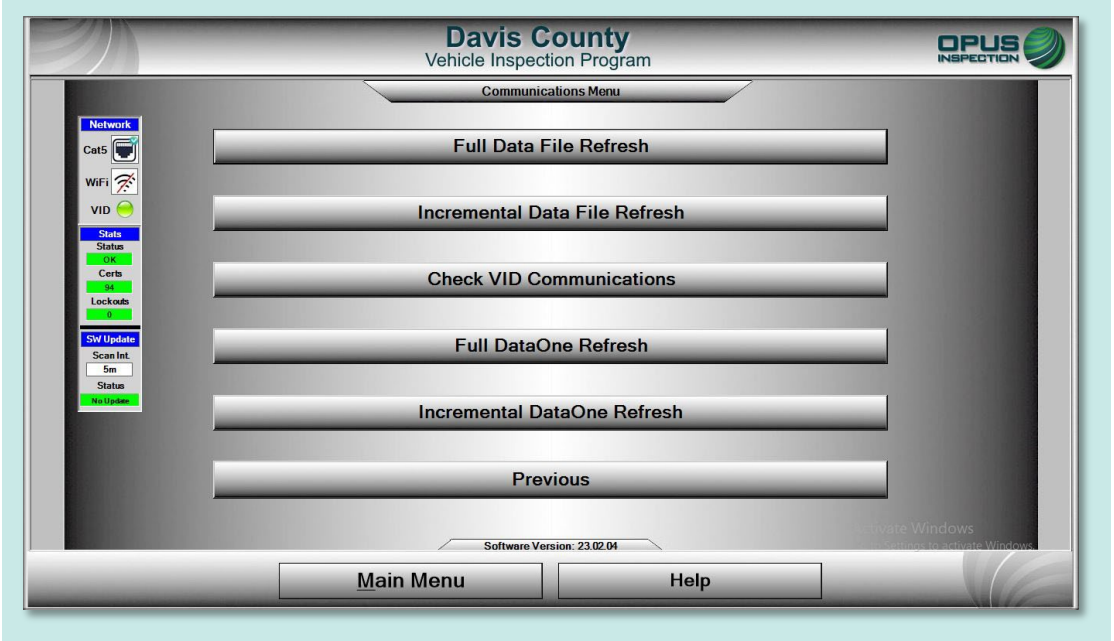


6.7 Communications menu

The **Communications Menu** (Figure 60) offers several simple functions primarily used with inspection system troubleshooting, including:

- Full data file refresh
- Incremental data file refresh
- Check VID communications
- Full DataOne refresh
- Incremental DataOne refresh
- Previous

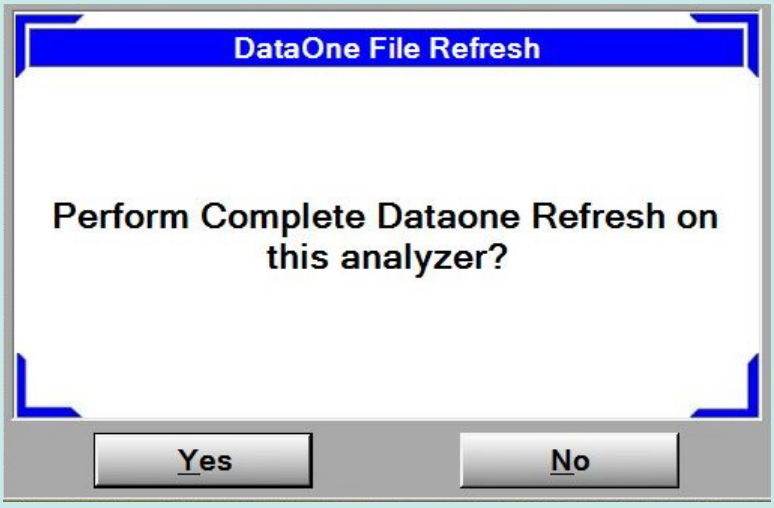
Figure 60: Communications menu



6.7.1 Data file and DataOne file refresh functions

Data files (inspection and vehicle data) and DataOne (vehicle data lookup) files can be refreshed by selecting either **Full** or **Incremental** refresh options from the Communications Menu. A screen indicating that the inspection system is connecting with the VID will appear. With the DataOne refresh, a pop-up prompt requesting confirmation will appear (Figure 61); tap **YES** to proceed or **NO** to abort the action.

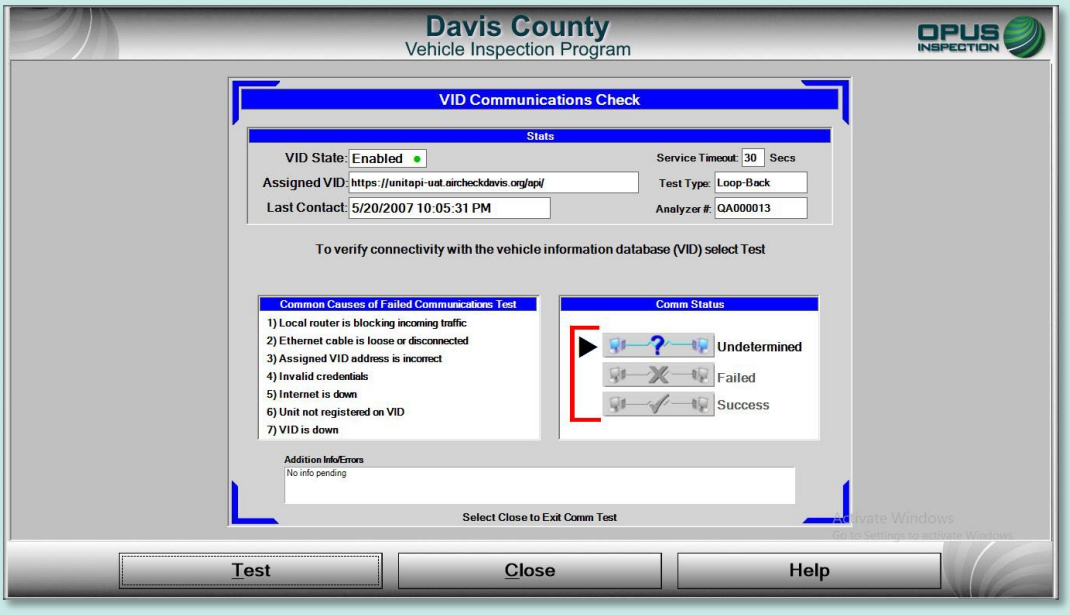
Figure 61: Performing complete DataOne refresh—confirmation prompt



6.7.2 VID communications check

Selecting **Check VID Communications** from the **Communications Menu** will display a screen (Figure 62) that produces relevant stats when the **Test** button is selected. The results screen includes a list of common failure causes and the current comm status.

Figure 62: VID communications check in-progress



6.8 Choose printer

Selecting Choose Printer from the Utilities Menu will allow you to choose from available printers detected by the inspection system.

6.9 Previous

Selecting Previous from the Utilities Menu will return you to the Main Menu.

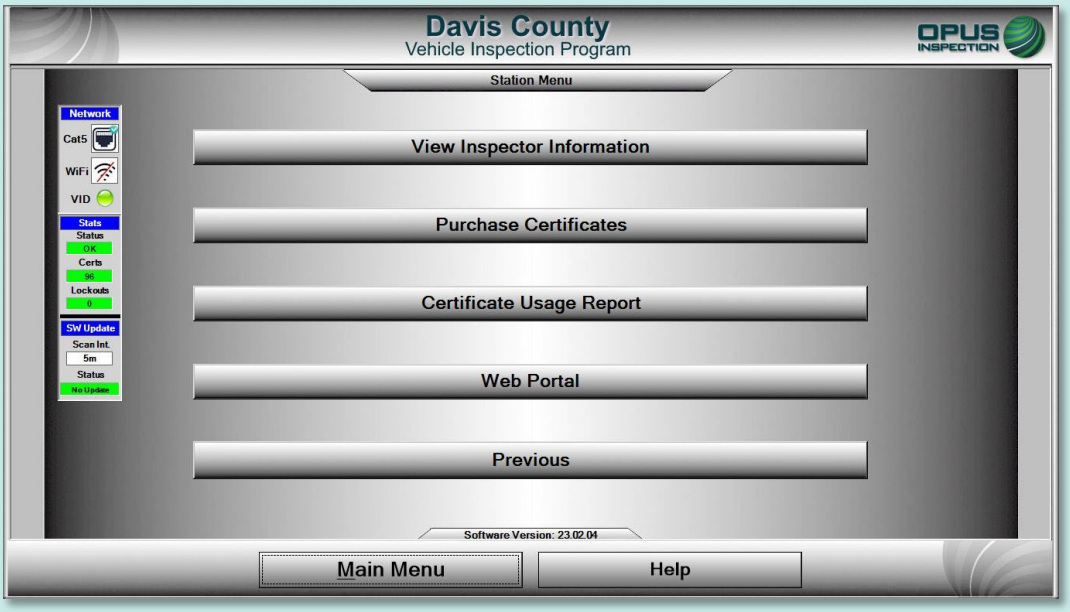
7.Station menu

The Station Menu (Figure 63) provides several important and useful functions available to authorized users, including:

- View inspector information
- Purchase certificates
- Certificate usage report
- Resend records to VID
- Web portal
- Previous

These functions are described in the subsections below:

Figure 63: Station menu



7.1 View inspector information

Selecting View Inspector Information displays a screen listing all inspectors authorized to perform inspections on the inspection system. Information listed includes expiration date and access level.

7.2 Purchase certificates

Selecting Purchase Certificates from the Station Menu will take you to the login screen on program website. Enter the username and password and follow instructions on the website.

7.3 Certificate usage report

Selecting the Certificate Usage Report from the Station Menu will display a screen with a table of certificates used by day and inspector.

7.4 Web portal

Selecting Web Portal from the Station Menu will bring up the Davis County program website.

7.5 Previous

Selecting Previous from the Station Menu will return you to the Main Menu.

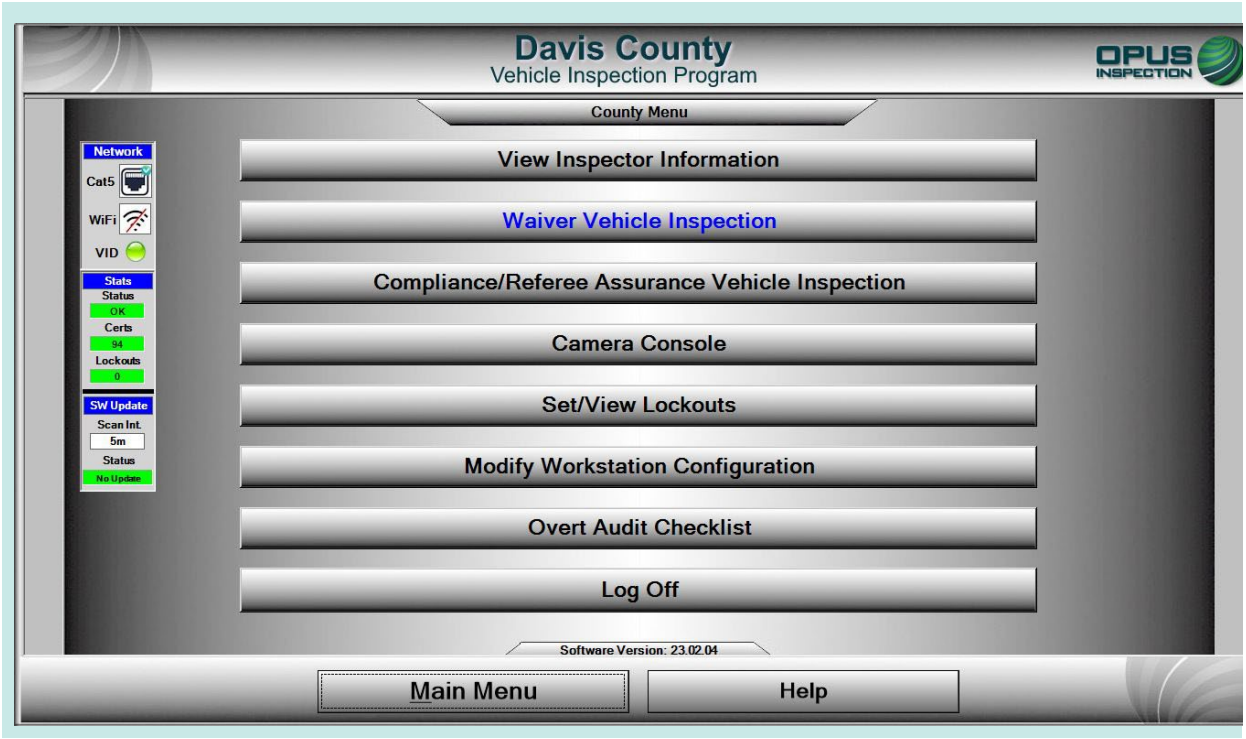
8.County menu

The County menu (Figure 64) includes the following options:

- View inspector information
- Waiver vehicle inspection
- Compliance/referee assurance vehicle inspection
- Camera console
- Set/view lockouts
- Modify workstation configuration
- Overt Audit Checklist

Each menu option is described briefly below.

Figure 64: County menu



8.1 View inspector information

This option enables the County user to view a table of inspectors authorized to perform inspections using the analyzer.

8.2 Waiver vehicle inspection

Selecting this option enables the authorized user to perform a waiver vehicle inspection. The waiver inspection emulates the standard vehicle inspection process with the addition of certain overrides.

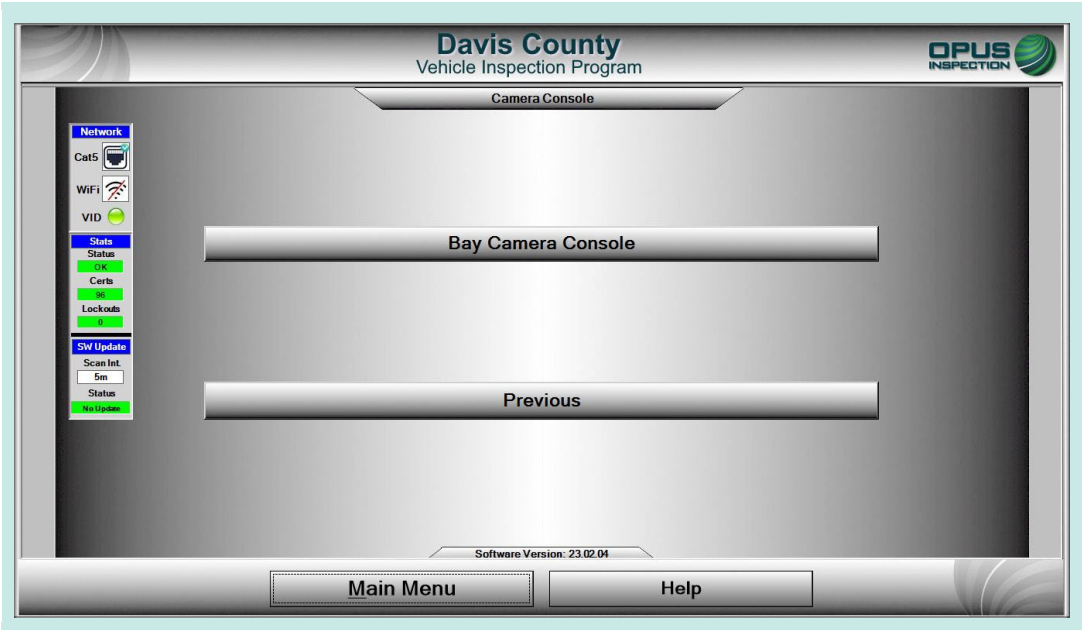
8.3 Compliance/referee assurance vehicle inspection

As with the waiver vehicle inspection, selecting this option enables the authorized compliance officer/referee to perform a vehicle inspection that emulates the standard vehicle inspection process with the addition of certain overrides.

8.4 Camera console

The Camera console menu (Figure 65) provides access to the **Bay Camera Console**.

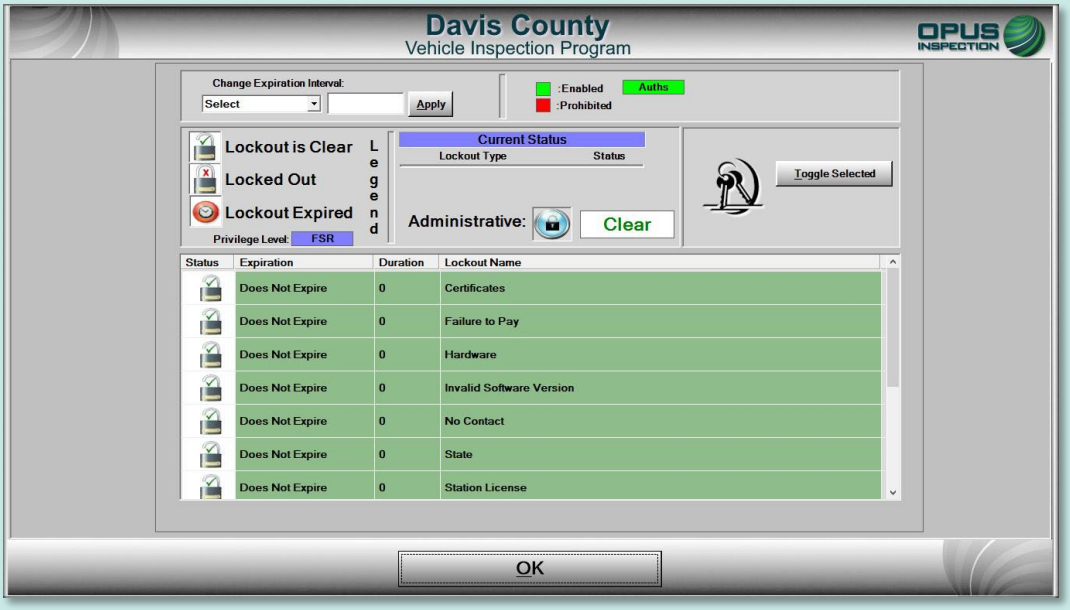
Figure 65: County—Camera console menu



8.5 Set/view lockouts

The Set/view lockouts option (Figure 66) provides the user with ability to view and manage the analyzer's lockouts.

Figure 66: County—Set/view lockouts



8.6 Modify workstation configuration

Selecting the modify workstation configuration option brings you to a menu (Figure 67) that provides the utilities listed below. Most of these options are self-explanatory.

- Update workstation information (seen in Figure 68)
- Software update
- Reset workstation date and time
- Choose printer
- Previous

Figure 67: County—Modify workstation configuration menu

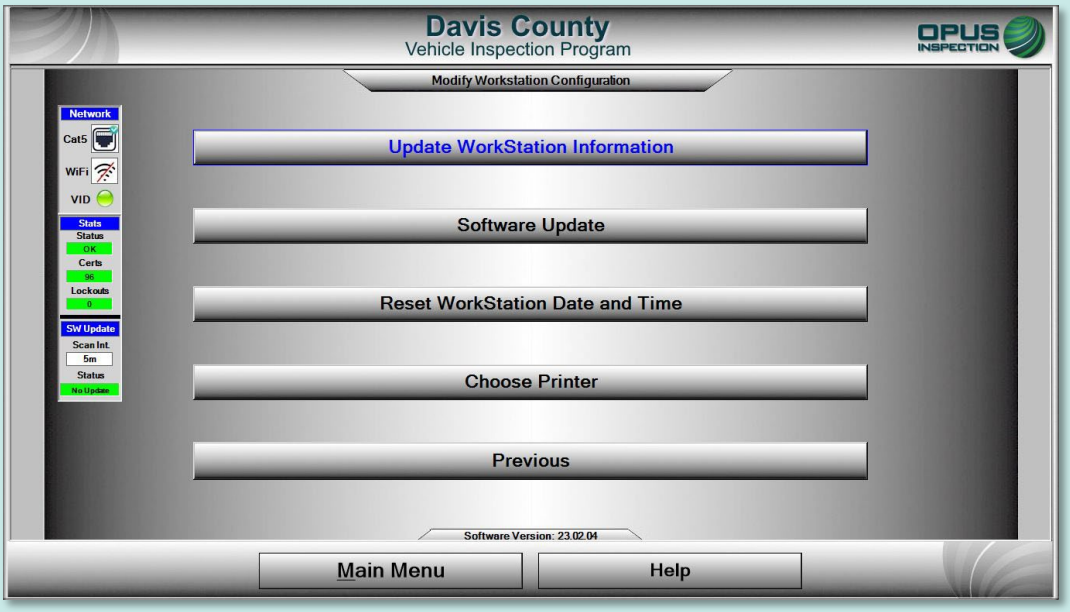
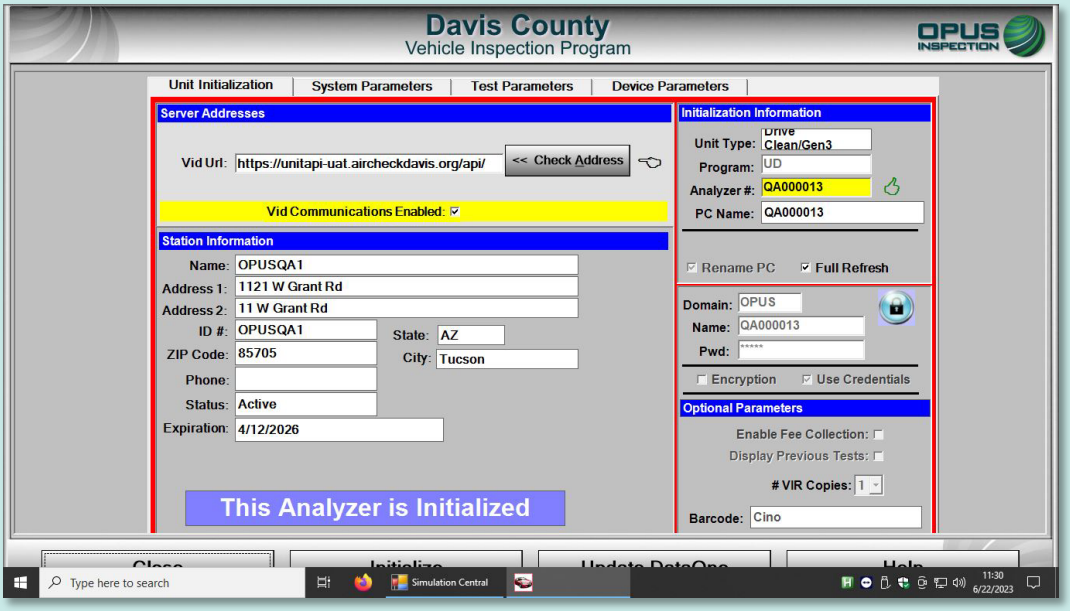


Figure 68: County—Update workstation information



8.7 Overt Audit Checklist

This County menu option sends the authorized user to a screen for logging on to the Opus VID Central database management console.

9.Service tech menu

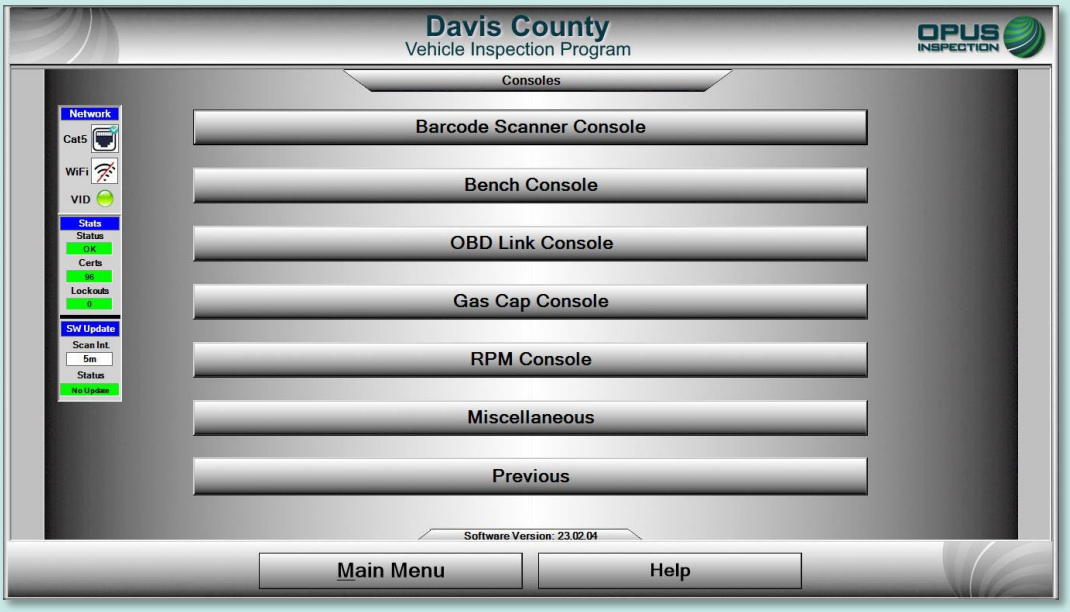
The service tech menu (Figure 69) provides the authorized Opus field service technician with the following options:

- Consoles (see Figure 70)
- OBD-II Self-check
- Analyzer status
- Communications menu
- Set/view lockouts
- Modify workstation configuration
- Log off

Most of these functions are also found under the Utilities menu and are described in in Section 6 of this manual.

Figure 69: Service Tech Menu

Figure 70: Service Tech—Consoles menu

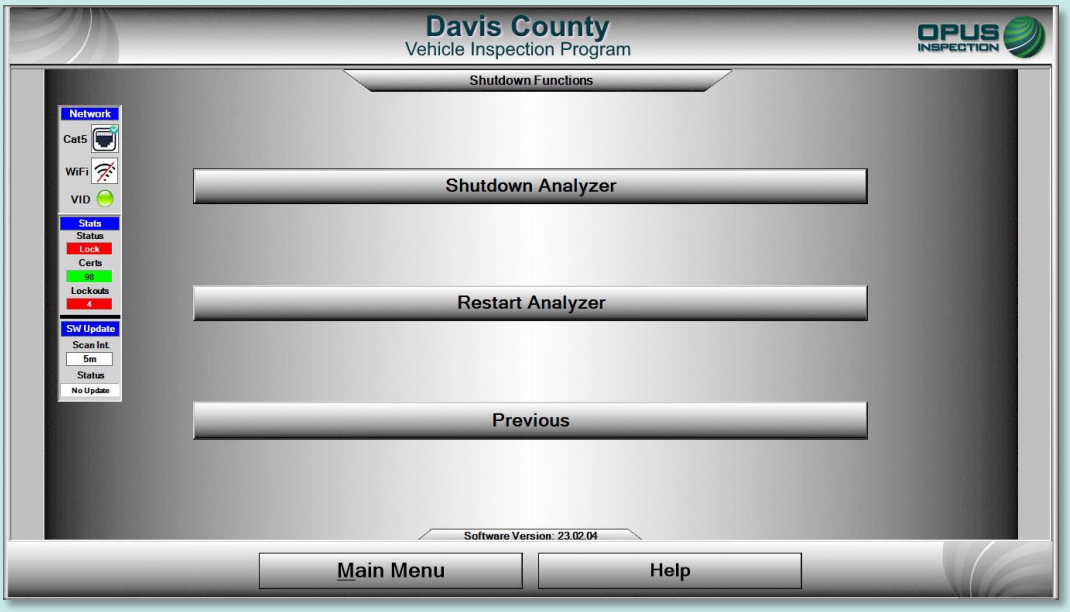


10. System shut down

The **Shutdown Functions** menu (Figure 71) provides three self-explanatory functions:

- **Shut down analyzer**, which performs a system shut down and turns off the DriveClean tablet.
- **Restart analyzer** (inspection system), which initiates a reboot of the DriveClean tablet; and
- **Previous**, which returns the user to the **Main Menu** without initiating shut down functions.

Figure 71: Shut down functions menu



11. Maintenance

The Davis County inspection system is designed to require little maintenance. Cables should be inspected on a periodic basis and worn components should be replaced.

To clean the touchscreen and camera lenses on the DriveClean tablet, use a soft, lint-free cloth. Paper-based wipes and paper towels must be avoided as they can leave scratches on the screen and lenses. A microfiber cloth is best for cleaning.

Avoid using solvents or cleansers on any tablet surface. A solution of 70% isopropyl alcohol with distilled water is recommended.

12. Opus contact information

If you have questions that are service related, please contact Opus Inspection at the following toll-free telephone number for assistance: 1 (800) 695-4377.

Davis County Vehicle Inspection System Operator's Manual
Gen3 TSI/OBD-II System

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1.Introduction

This manual provides important operating information, features, and helpful tips concerning the Davis County inspection system and associated components. This introductory section describes the conventions used in this manual as well as general safety tips.

1.1 Conventions and safety

1.1.1 Conventions

This operator's manual is organized to facilitate quick access to sections and topics related to the Davis County inspection system and the vehicle inspection process. Occasionally, text of particular importance will be emphasized using the conventions described below.

Text pertaining to features appearing on the Gen3 System monitor, such as buttons or bars that activate functions or display data, are highlighted in **bold green type**.

The **stop icon** draws attention to issues concerning safety of personnel and equipment. Please read carefully and follow all instructions.

The **important information icon** draws attention to important procedural tips or inspection system features.

1.1.2 Important general safety instructions

Please read the following instructions carefully before using equipment.

- Read and follow all inspection system instructions.
- When using your Davis County Gen3 inspection system, follow all safety instructions.
- Only use Davis County inspection system equipment as described in this manual.
- Remain in the vehicle as needed during emissions testing.
- Please handle equipment with care. Inspection system components can be damaged through carelessness.
- Do not drop equipment.
- Do not let cables or cords hang over edge of a table, bench, or counter; or contact hot manifolds or moving fan blades.
- Care should be taken to arrange cables and cords so that they will not create a tripping hazard or become pulled out causing equipment to malfunction or shut down.

- Always have adequate ventilation when working on vehicles with the engine running.
- Use only manufacturer-designated peripherals and accessories.
- Follow all Davis County and Davis County Health Department policies and procedures. In case of discrepancy, Davis County Health Department policies and procedures supersede this manual.

2. Mobile source air toxics and improving air quality through testing

Mobile source air toxics[1] are compounds emitted from highway vehicles and nonroad equipment that are known or suspected to cause cancer or other serious health and environmental effects. Mobile sources are responsible for direct emissions of air toxics and contribute to precursor emissions that react to form secondary pollutants. Examples of mobile source air toxics include benzene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein, polycyclic organic matter (POM), naphthalene, and diesel particulate matter.

Cancer and noncancer health effects can result from exposures to air toxics.

In February 2007, EPA finalized a rule to reduce hazardous air pollutants from mobile sources. The rule limits the benzene content of gasoline and reduces toxic emissions from passenger vehicles and PAS cans. EPA estimates that in 2030 this rule will reduce total emissions of mobile source air toxics by 330,000 tons and VOC emissions (precursors to ozone and PM2.5) by more than 1 million tons.

EPA has adopted many mobile source emission control programs that, in addition to controlling pollutants such as hydrocarbons, particulate matter, and nitrogen oxides, will also result in large air toxic reductions.

Inspection and maintenance programs

Vehicle inspection and maintenance programs (I/M) help improve air quality by identifying high-emitting vehicles in need of repair (through visual inspection, emissions testing, and/or the downloading of fault codes from a vehicle's onboard computer) and causing them to be fixed as a prerequisite to vehicle registration within a given non-attainment area. The 1990 Amendments to the Clean Air Act made I/M mandatory for several areas across the country, based upon various criteria, such as air quality classification, population, and/or geographic location.

On-board diagnostics

On-Board Diagnostics, or OBD, is a computer-based system built into all 1996 and later light-duty vehicles and trucks to monitor a vehicle's engine, transmission, and emissions control components. If a vehicle's **Check Engine** light comes on and stays on, the vehicle's OBD system is alerting the motorist that it has detected a problem with the vehicle.

In addition to protecting the environment, the Check Engine light and the OBD system behind it can save motorists time and money by identifying minor problems before they become major repair bills.

[1] From http://www3.epa.gov/otaq/toxics.htm

3.Features and capabilities

3.1 Introducing the Davis County inspection system

The Opus team is very pleased to introduce the Davis County inspection system for emissions testing in the Davis County I/M program. The high-tech Opus Gen3 TSI/OBD-II System provides the best possible operational functionality and flexibility, maximizing customer convenience and test efficiency.

All Gen3 TSI/OBD-II Systems and peripheral equipment are networked and tied into the Opus Davis County VID, communicating wirelessly in real-time. All equipment meets or exceeds the specifications contained in the EPA, State of Utah, and Davis County Health Department regulations, guidance, or requirements.

Davis County inspection system components include:

- Dell Optiplex 3000 computer with keyboard and wired mouse
- 19" wide screen LCD monitor
- Microsoft Windows 10 software
- 4-GAS Sample System featuring Crestline IR
- Bench and all associated peripherals (see gas analyzer system details below)
- Opus IVS IMclean DAD OBD interface (including OBD RPM monitor)
- Additional Capelec 8510 Non-Contact RPM
- Monitor (for vehicles without OBD monitoring capability)
- Gas cap tester with fuel cap adapters
- Xenon 1950 1D/2D barcode scanner
- Reolink 511 IP lane camera
- Ricoh WG-70 Handheld video capable digital camera
- HP M406 laser printer
- LAN port
- Zero gas
- One (1) high gas
  - High Range Calibration Gas per DCHD Regulation, Appendix E, Section 3.2:
    - HC = 3200 ppm propane
    - CO = 8.0 percent
    - CO_2 = 12.0 percent
    - O_2= 20.9%
    - N_2 = Balance 99.99 percent pure
- Operator's Manual

3.1.1 Gen3 TSI/OBD-II System

The front view of the Gen3 TSI/OBD-II System with cabinet and peripherals is shown in Figure 1.

Figure 1: Gen3 TSI/OBD-II System

3.2 Inspection system software—security and convenience

The Davis County inspection system is automated to the highest degree possible to minimize the potential for fraud and human error and is exceedingly secure from tampering and abuse.

Inspectors are guided through the testing process by the inspection software and are not allowed to deviate from approved test procedures. Opus engineers carry this security strategy to its logical conclusion by:

- Automating pass, fail, and rejection decisions; and
- Performing system integrity checks before each test, as applicable;

In short, the system:

- Uses automation to decrease, to the highest degree possible, the potential for intentional fraud and/or human error;
- Provides security from tampering and/or abuse; and

- Is based on detailed written specifications.

The software is designed to automatically:

- Make pass/fail decisions for all measurements;
- Record and store all equipment check, calibration, and test data; and
- Initiate immediate lockouts for violation of pre-defined security parameters of failure to conduct or pass required quality assurance procedures.

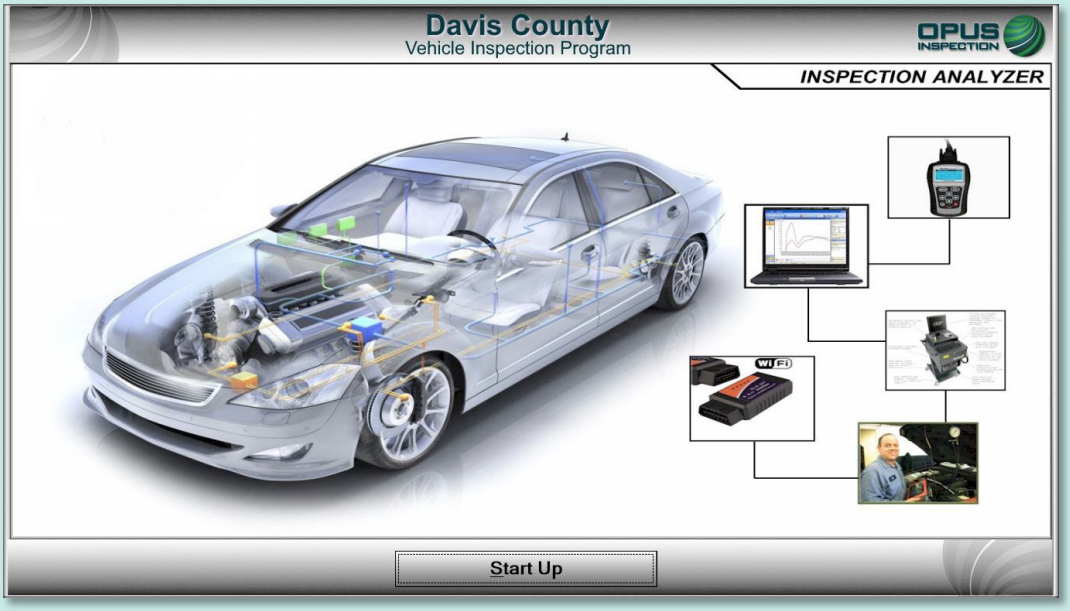
4.System startup, operation, and shut down

The Gen3 TSI/OBD-II System menus provide access to the functions you need to perform vehicle inspections. The menu system also allows you or your station manager to carry out necessary administrative tasks. This chapter explains these features and how to apply them to the routine operation of your inspection system. Detailed descriptions of selected functions referenced in this section are contained in other chapters in this manual.

4.1 Startup menu

The startup screen (Figure 2) appears when the computer is turned on. Select **Start Up** to prepare the analyzer, refresh data, and then display the **Main Menu**.

Figure 2: Inspection system startup



During the startup sequence, screens will briefly appear displaying activities such as synchronizing with the vehicle inspection database (VID) server (Figure 3), checking for and applying pending software updates, reconciling test records with the VID, and updating vehicle lookup tables (Figure 4).

Typically, the inspection system startup should take only a minute or two. If any problems or errors are encountered during startup, you will be prompted to seek assistance.

Figure 3: System startup in progress

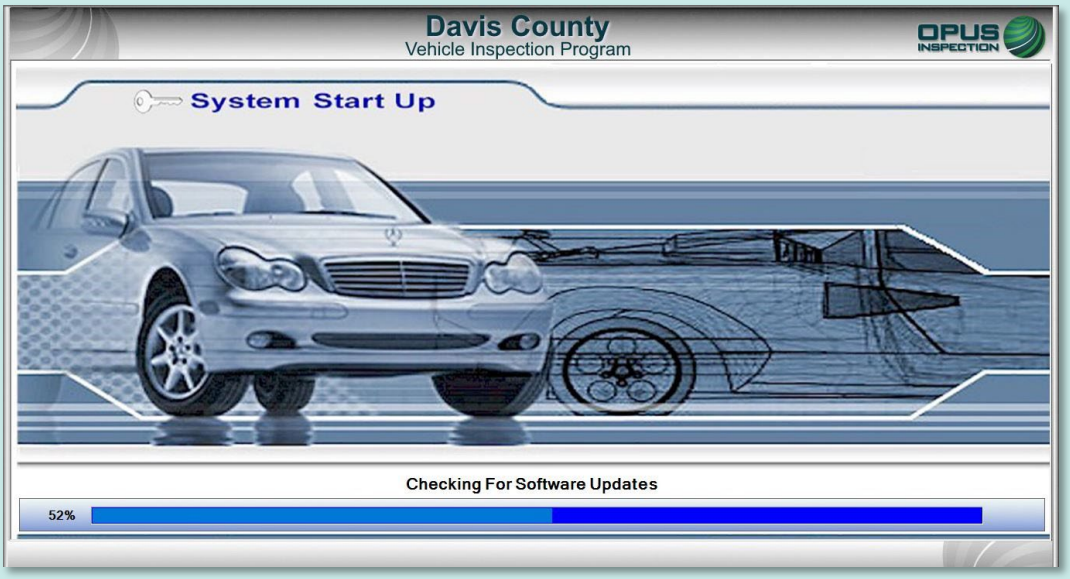
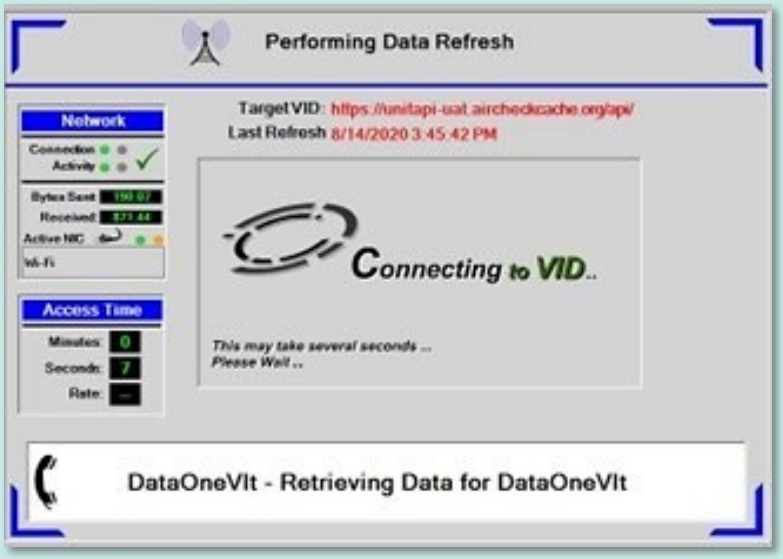


Figure 4: System startup—connecting to VID



4.1.1 Software update prompt

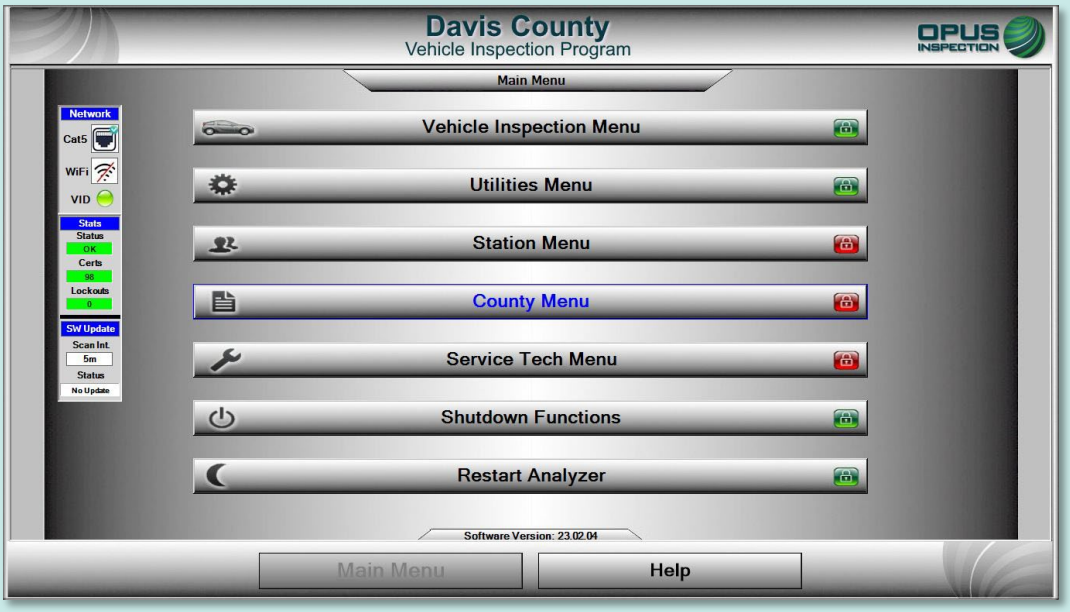
Occasionally, a pop-up box will appear notifying you of a pending inspection system software update. This may occur at any time, most often at startup, but never during an actual inspection. You will be prompted to click **Yes** to initiate the update, or **No** to defer the update to a more optimal time. Typically, software updates will only take five to ten minutes and during the update the Gen3 TSI/OBD-II System may reboot one or more times. You will be notified when the software update has been completed.

If you choose to defer the update (such as when a customer is waiting or other time-sensitive issue arises), the inspection system will allow you to continue; however, the update pop-up box will soon reappear. To ensure optimal system performance and compliance with any changes to the inspection process, we highly recommend initiating the software update as soon as possible. Prolonged deferment of the software update may trigger a lockout.

4.2 Inspection system operation

4.2.1 Main menu

Figure 5: Main menu



The menu options listed below are available from the **Main Menu** (Figure 5).

Menu options labeled with a red lock icon are only available to authorized station, County, or Opus personnel.

- **Vehicle Inspection Menu:** Authorized station users can select this menu to perform a vehicle inspection, view remaining certificates, perform an OBD self-check, perform calibrations, or run the system in demo or training mode.
- **Utilities Menu:** Any user can select this menu to check equipment consoles, reprint a VIR, view analyzer status information, access diagnostic test modes, initiate communications sessions, choose printers, or view lockouts.
- **Station Menu:** Authorized station users can select this menu to view inspector information, purchase certificates, access a certificate usage report, and access the web portal.
- **County Menu:** Authorized County officials can select this menu to perform designated activities, such as view inspection information, perform waiver vehicle inspections, perform compliance/referee inspections, access the camera console, set and view lockouts, modify workstation (analyzer) configuration, and access the overt audit checklist.
- **Service Tech Menu**: Authorized Opus users utilize this selection to check and manage consoles, perform an OBD self-check, view analyzer status, access communications tools, set and view lockouts, and modify workstation configurations.
- **Shutdown Functions:** Any user can use this menu to shut down or restart the Gen3 TSI/OBD-II System.
- **Restart Analyzer:** Activating this button restarts the Gen3 System.
- **Help:** Selecting this button displays the system documentation. The **Help** button is available on multiple screens.

4.2.2 Inspection screen dashboards

An on-screen dashboard (Figure 6) appears at the top of screens pertaining to vehicle inspection, training/demo mode, and diagnostic processes. The dashboard displays:

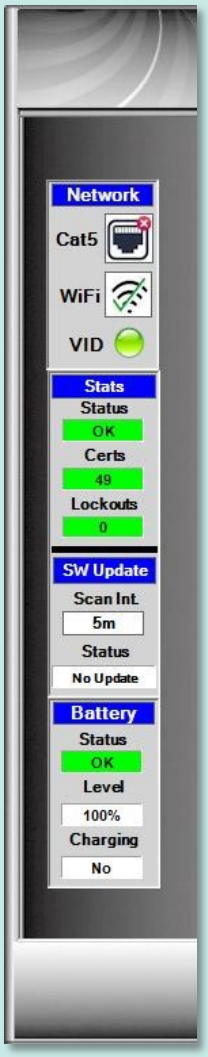
- Test mode
- Inspector
- Plate
- Lockout status
- Inspection start time
- Current time
- Duration of inspection

A green thermometer is integrated with the dashboard that tracks the progress of the five-stage vehicle inspection process, from vehicle entry to the printing of the VIR.

Figure 6: Inspection screen dashboard

A vertical dashboard (Figure 7) also appears on inspection and menu screens. This dashboard monitors communication, unit information (such as lockout and certificates), software, and battery status.

Figure 7: Vertical dashboard



4.2.3 Printer connection

The laser printer is located in the Gen3 TSI/OBD-II System cabinet and connected via printer cable.

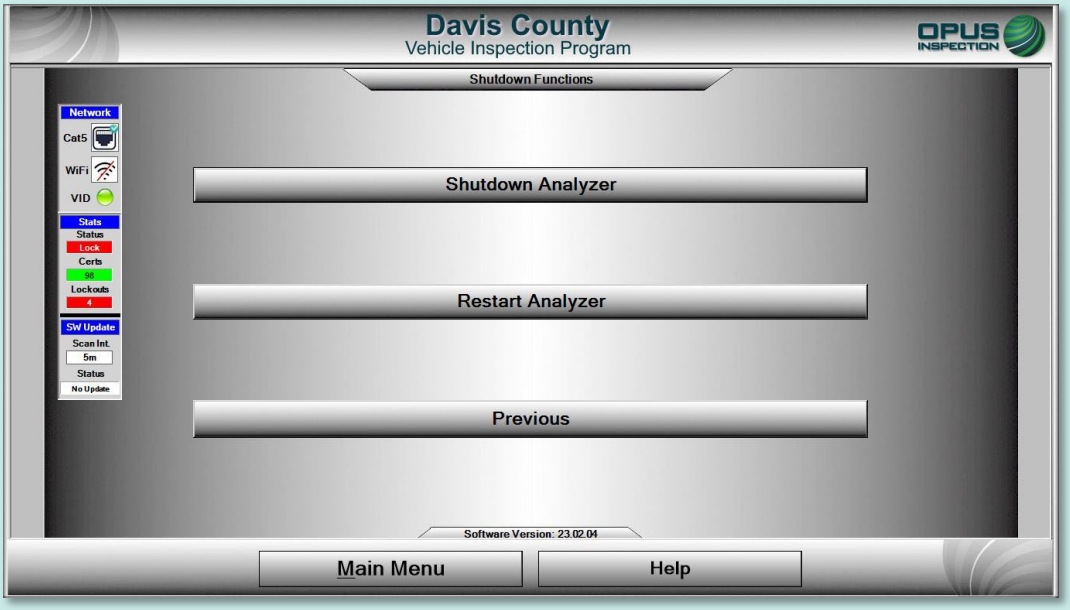
4.2.4 Offline operation

If the Gen3 System is not online with the VID, the system allows transactions to queue up to be sent as soon as the unit is back online, and communication is re-established with the VID. The software for Davis County allows transactions to be processed by comparing a time stamp of when the system was last connected to the VID to the current date.

4.3 System shutdown

To shut down the inspection system, select **Shutdown Functions** from the **Main Menu**. The **Shutdown Functions** screen will appear (Figure 8, next page). Click **Shutdown Analyzer** to shut down the system and power down the components. You also have the option of restarting the analyzer should it be necessary to do so.

Figure 8: Shut down functions menu



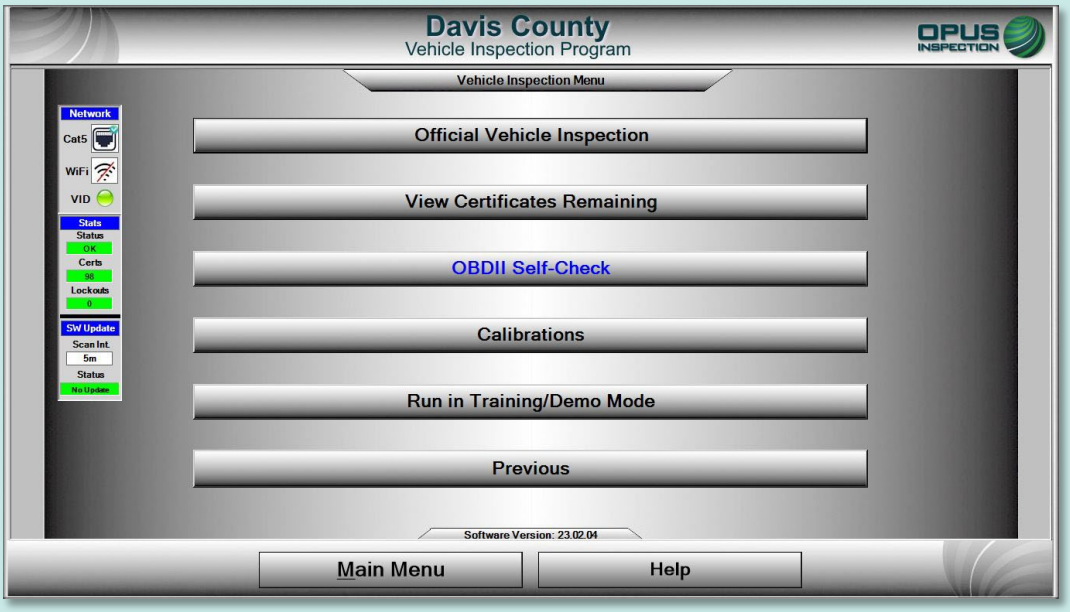
5. Vehicle inspection

This section of the Davis County inspection system operator's manual describes the entire vehicle inspection process, including vehicle identification, analyzer calibration, performing OBD and TSI inspections, and issuing the vehicle inspection report.

5.1 Official vehicle inspection

From the **Main Menu**, select the **Vehicle Inspection Menu** (Figure 9). To begin the inspection, select **Official Vehicle Inspection** from the **Vehicle Inspection Menu**.

Figure 9: Vehicle inspection menu



The same sequence of inspection screens will appear when **Waiver Vehicle Inspection** and **Compliance/Referee Assurance Vehicle Inspection** options are selected from the **County Menu**.

5.1.1 Inspector login

Before beginning the vehicle inspection, the inspector must login using manual validation. (Figure 10). Enter your five-digit inspector number (or select from the drop-down list) and password in the indicated fields and click **Continue**. The inspection system will display an error message on invalid entries (Figure 11).

Figure 10: Manual validation login prompt

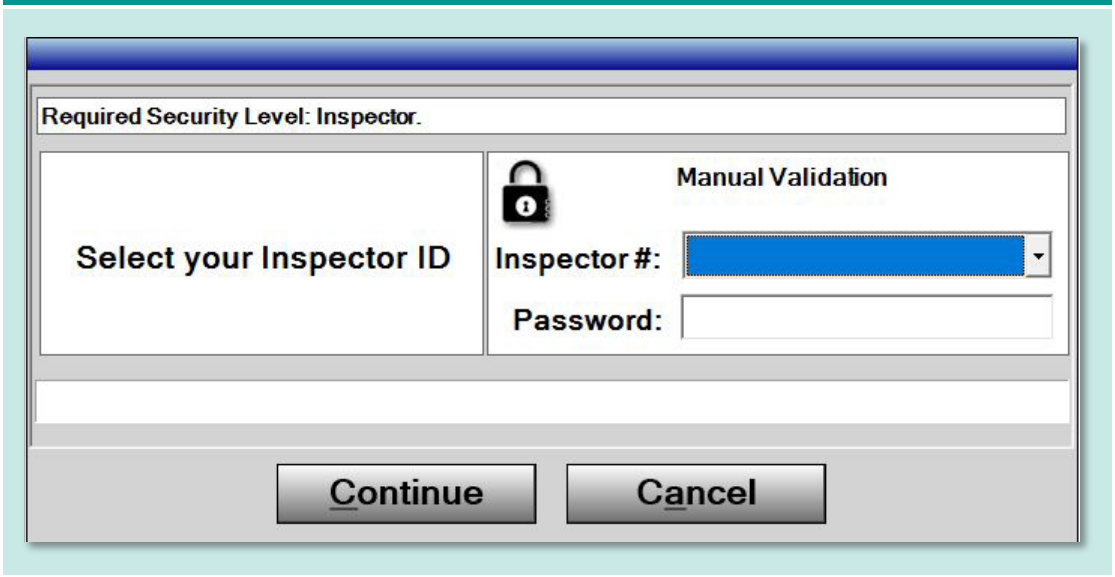
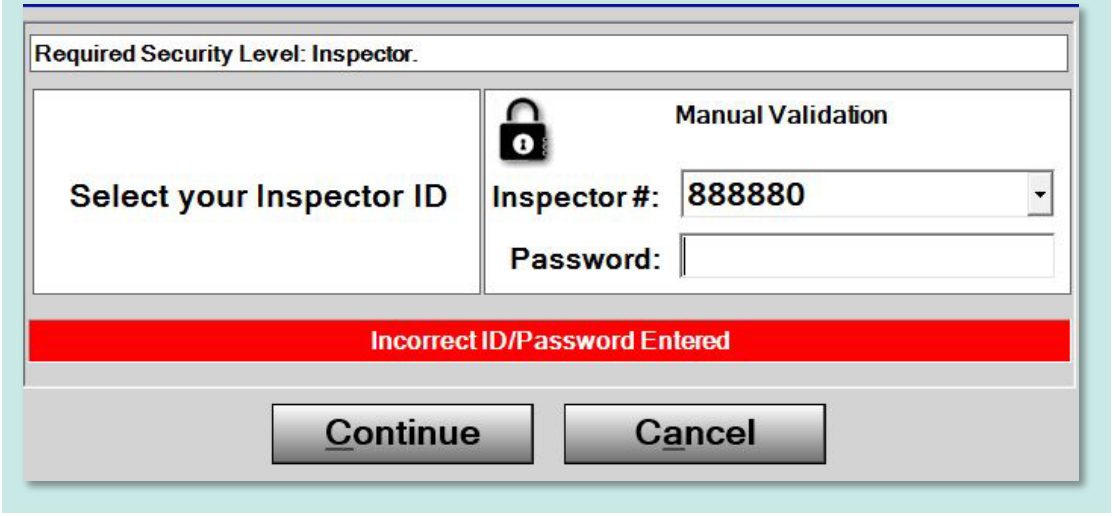


Figure 11: Incorrect ID or password entered



Inspection system messaging

In the interim between login and commencement of the vehicle inspection, the inspection system may display screens indicating the following:

- Validation of inspector name and password through the vehicle inspection database (VID);
- Notification of an expired account;
- Notification of inspection system lockout;

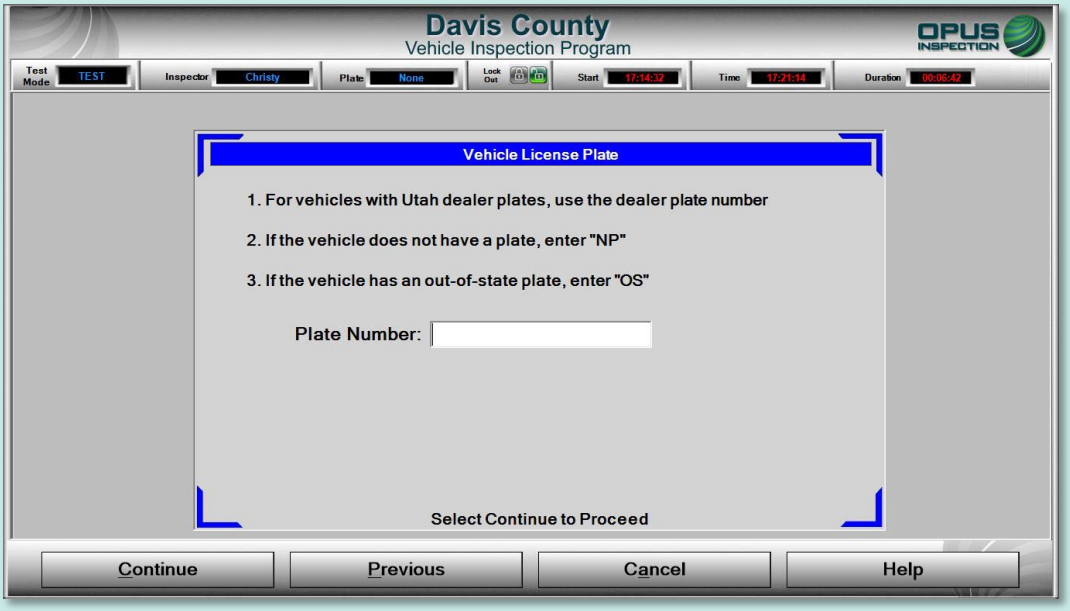
- Messages posted by County officials or Opus technical support; or
- Other system notifications.

Depending on the nature of the communication, you may be requested to standby or provided with instructions for resolving any issues prior to beginning the inspection process.

5.1.2 Vehicle license plate entry procedure

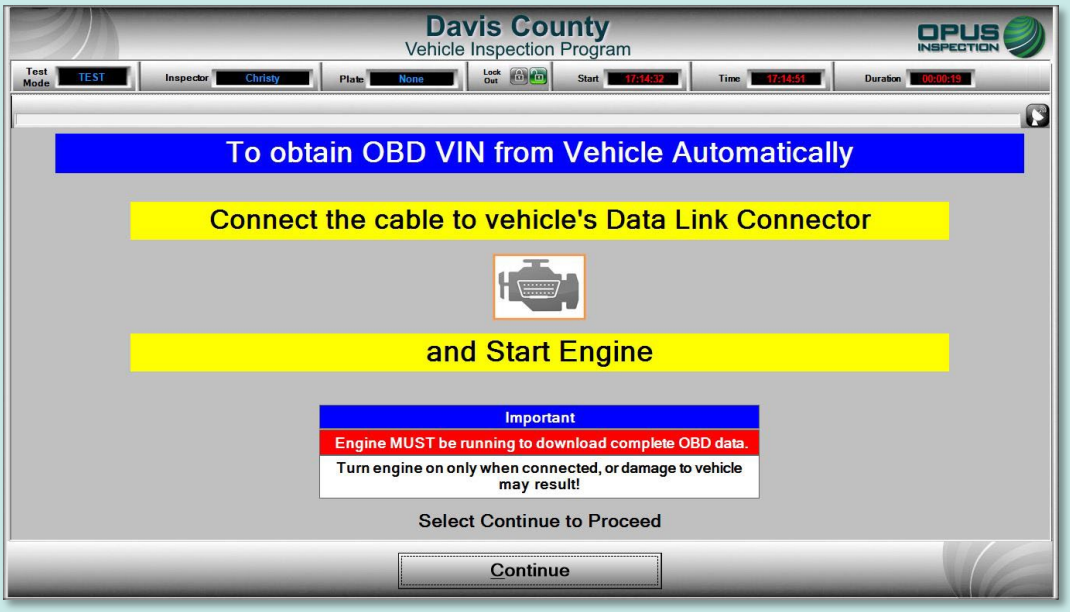
The **Vehicle License Plate** entry screen (Figure 12) will appear. Enter the vehicle's plate number in the field provided using Gen3 System's keyboard. As necessary, follow the instructions on the screen pertaining to a vehicle with a Utah dealer's plate, a vehicle with no plate at all, or a vehicle with an out-of-state license plate. Click **Continue** when finished.

Figure 12: Entering the vehicle license plate



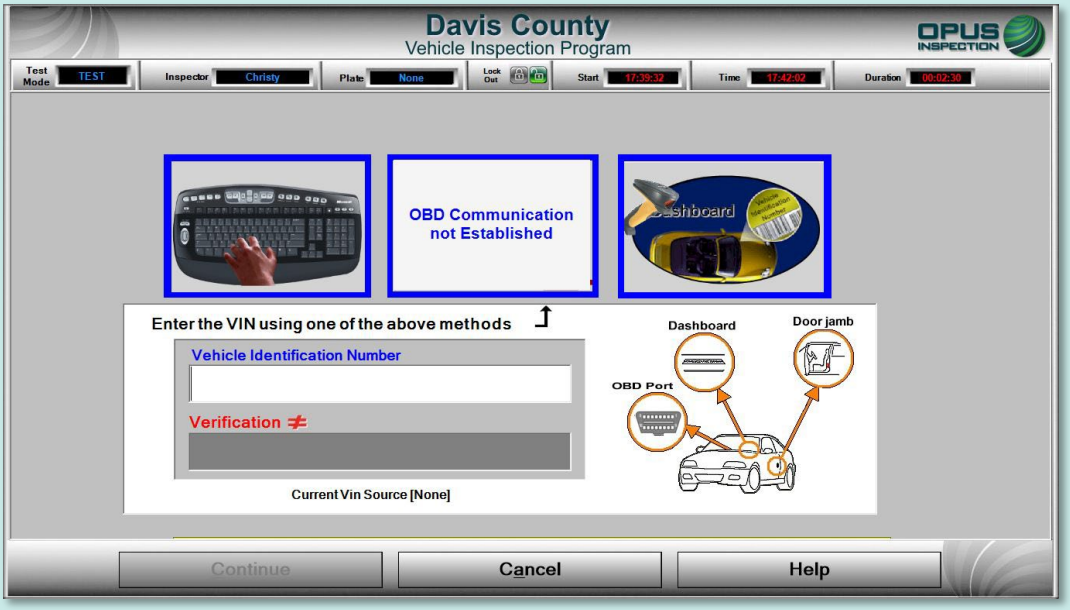
Following the license plate entry, you will be prompted to connect the OBD data link connector (if applicable) and start the vehicle's engine (Figure 13).

Figure 13: Prompt to connect OBD data link connector



In the event you are unable to successfully connect to the vehicle's DLC, a message will appear in the center box (Figure 14). Enter the VIN using one of the other methods indicated on the screen.

Figure 14: DLC connection failure



5.1.3 VIN entry

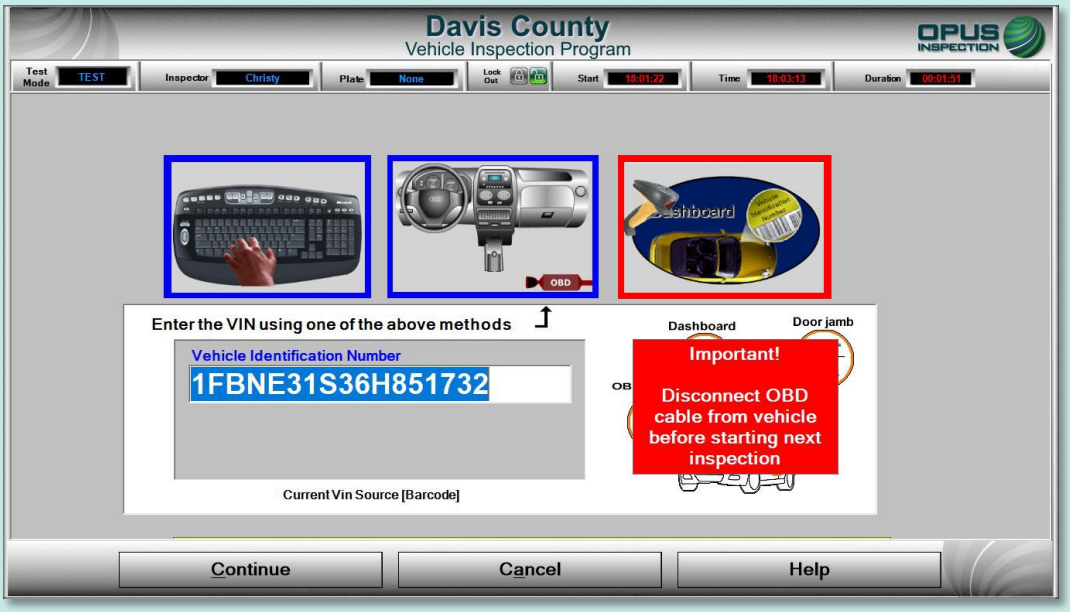
The inspection system will automatically perform the OBD test and scan the vehicle's system for the vehicle identification number (VIN).

- If the VIN is obtained through the OBD connection, you will be prompted to disconnect the OBD cable and proceed to the next step in the inspection.
- If the vehicle does not support obtaining the VIN through the OBD connection (see Figure 14), the VIN will need to be either entered manually or scanned using the barcode scanner. The screen will provide both options.

Note that to ensure accuracy, *manual entry* of the VIN is a double-blind process.

After the vehicle's VIN has been entered, either using the barcode scanner (Figure 15). or through manual entry using the Gen3 System keyboard, click **Continue**

Figure 15: Barcode scan of vehicle VIN



The VIN entry screen features a blinking red/blue reminder in the lower-right corner to disconnect the OBD cable before proceeding to the next step in the inspection.

5.1.4 Data verification

Data verification is an important step in documenting the vehicle inspection process. The license plate state, plate number, and VIN will appear on the Data Verification screen (Figure 16). This screen will require you to select emissions **Decal PRESENT** or **Decal MISSING**, then confirm the selection (Figure 17).

Figure 16: Data verification screen

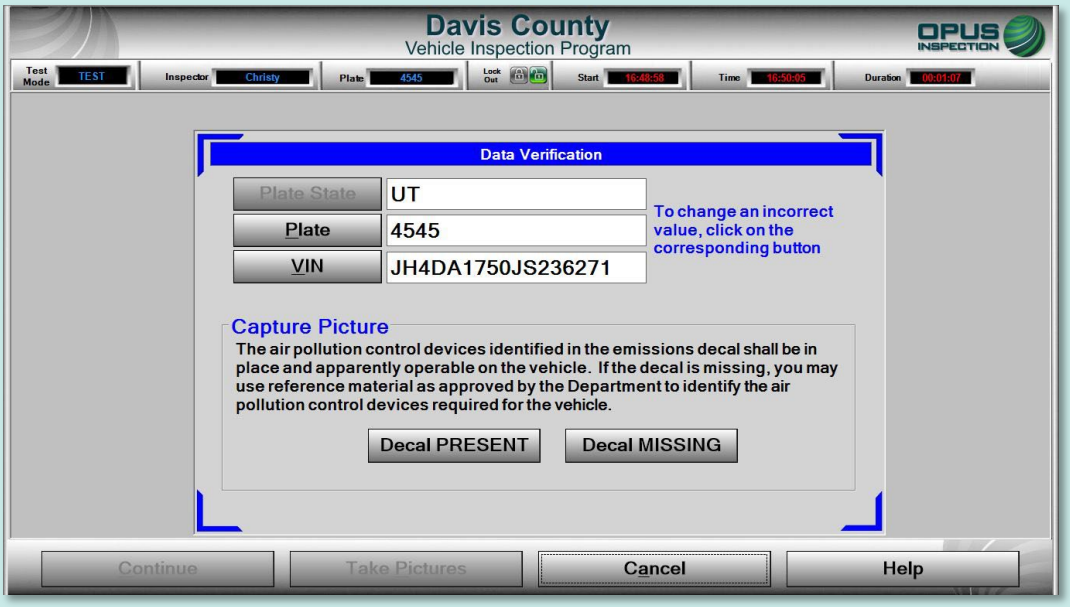
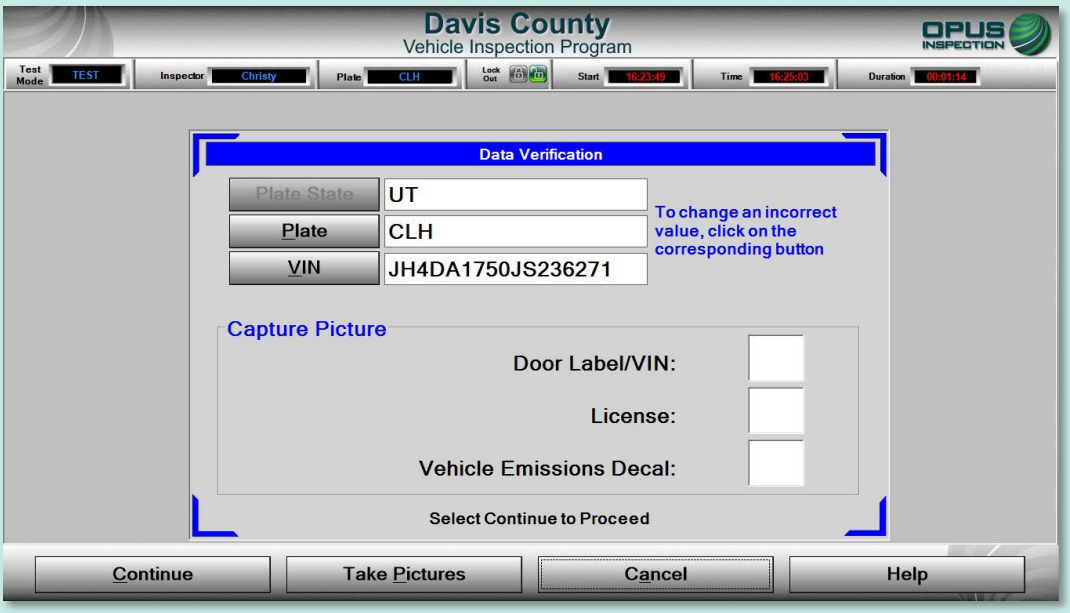


Figure 17: Data verification—prompt to confirm decal present

The next screen (Figure 18) will provide you with the opportunity to change incorrect license plate or VIN information, if necessary. Follow the procedure below to begin taking the required photos.

Figure 18: Data verification—prompt to capture pictures



Taking data verification photos is a two-step process, as described below:

- Unplug the handheld camera and take photos of the vehicle (in this case: license plate, decal, VIN plate).
- When all required photos have been taken, plug in the handheld camera to the PC and click **Take Pictures** button (see Figure 18), followed by **Connect** on the next screen (Figure 19) to access the photos on the camera.

Use the buttons on the screen to assign the different photos to the correct description (Figure 20). The photos will automatically be deleted from the camera after the process has been completed.

Figure 19:Data verification—prompt to connect camera

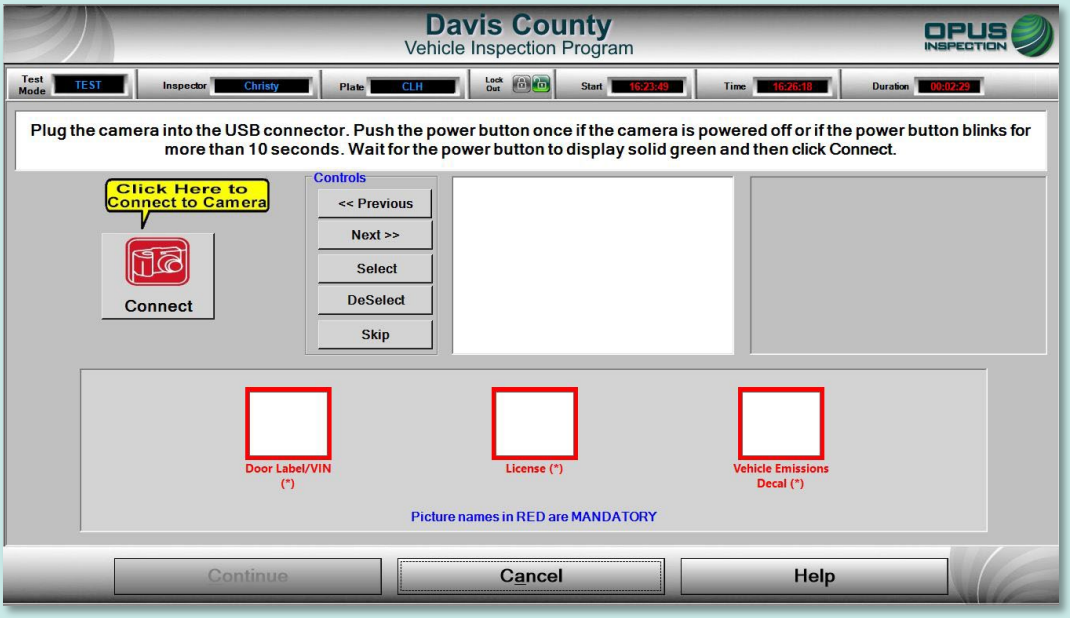
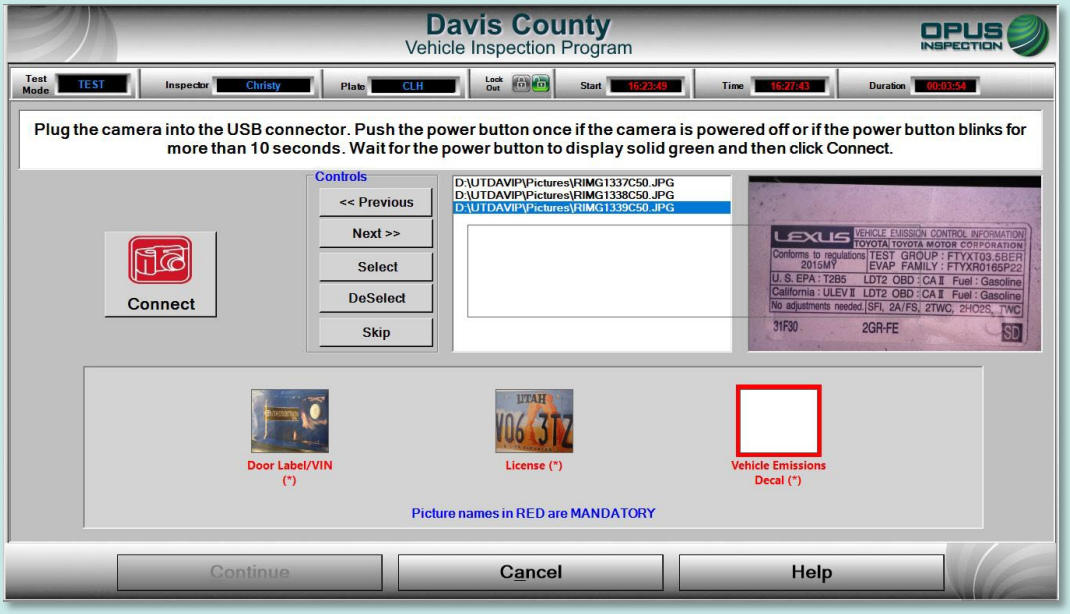


Figure 20: Data verification—required photo records



5.1.5 Vehicle information and vehicle data lookup

Once the VIN has been entered and verified, and mandatory photos captured, the inspection system will request additional vehicle information from the VID. When communication with the VID is complete, the inspection system will display the results and whether the vehicle information and/or previous test data were found.

- If a previous record found notice appears on the **VID lookup** screen (Figure 21), click **Continue** to view the results (Figure 22), then **Continue** again to continue the inspection. (If previous vehicle information is available, then some of the vehicle information prompts described in the following subsections will be omitted.)
- If no previous record is found, data will be acquired via VIN decode (Figure 23). Click **Continue** to proceed to additional data entry screens

Figure 21: Previous test lookup/previous test record found

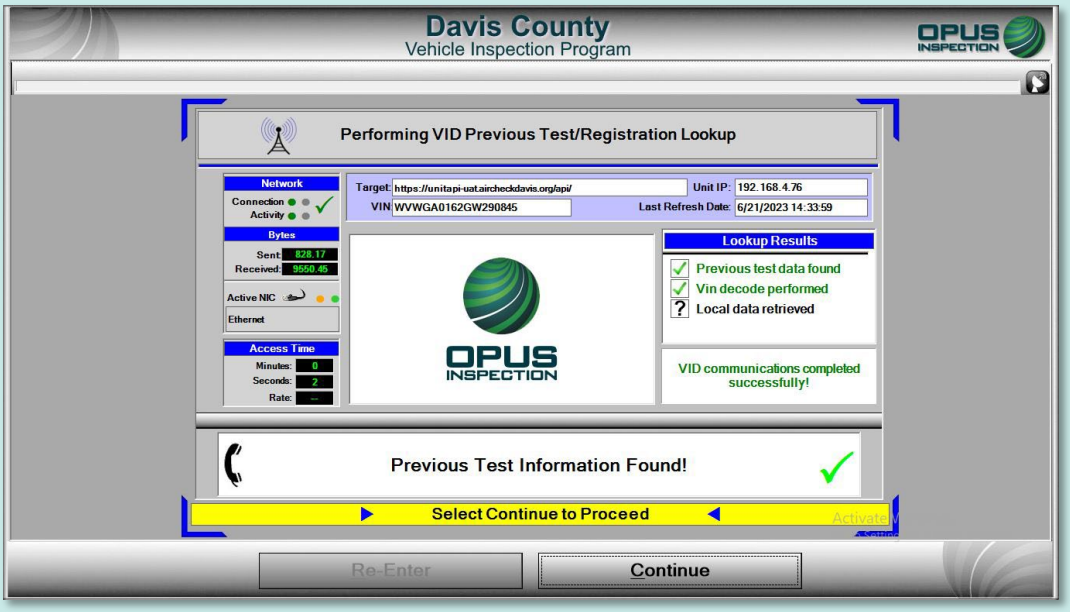


Figure 22: Previous test information

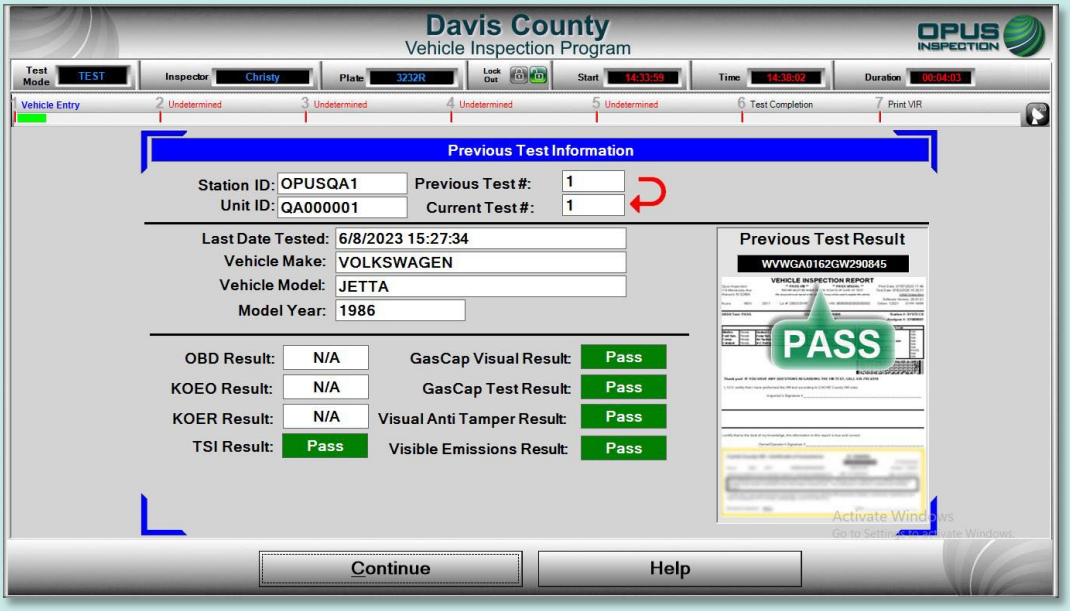
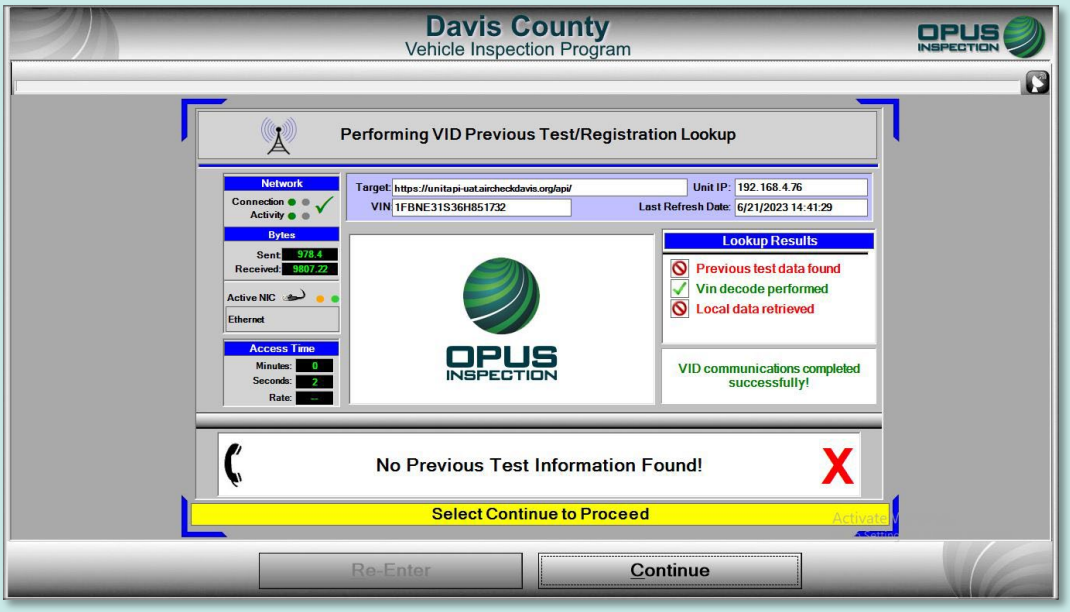


Figure 23: No previous test record/Data located from VIN decode



In circumstances where vehicle data lookup finds no previous data, a VIN decode was unable to be performed, and no local data was retrieved, the screen will deliver the following message:

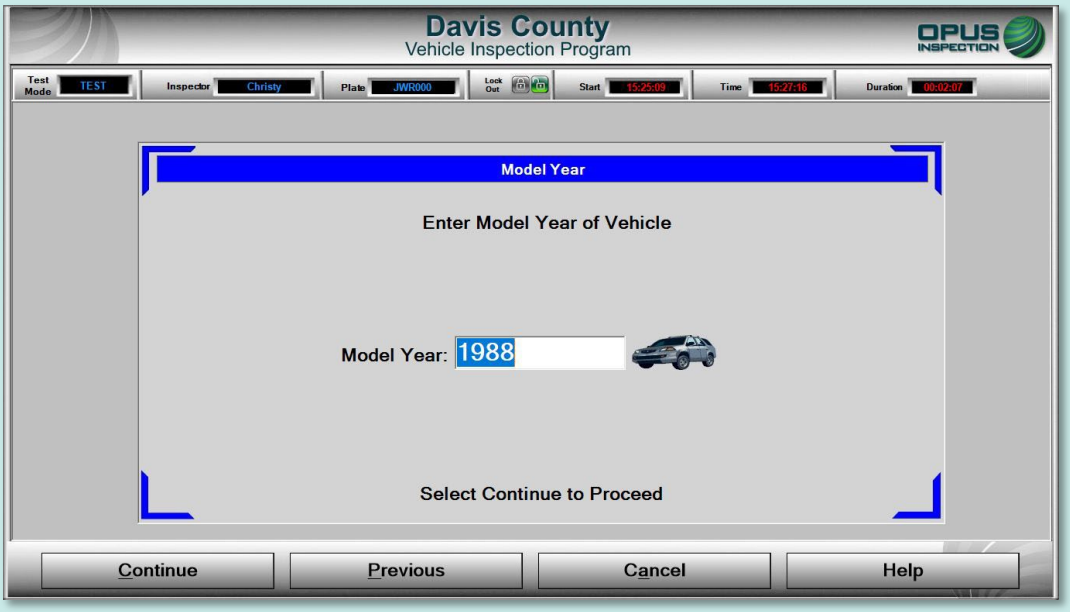
No matching data found! Is VIN correct?

In addition, the screen will notify you that manual entry of vehicle parameters is required. You may choose to click **Re-Enter** to correct the VIN error or click **Continue** to proceed with the inspection.

5.1.6 Vehicle model year entry

On the model year screen (Figure 24) enter the vehicle's model year in the field provided, then click **Continue**.

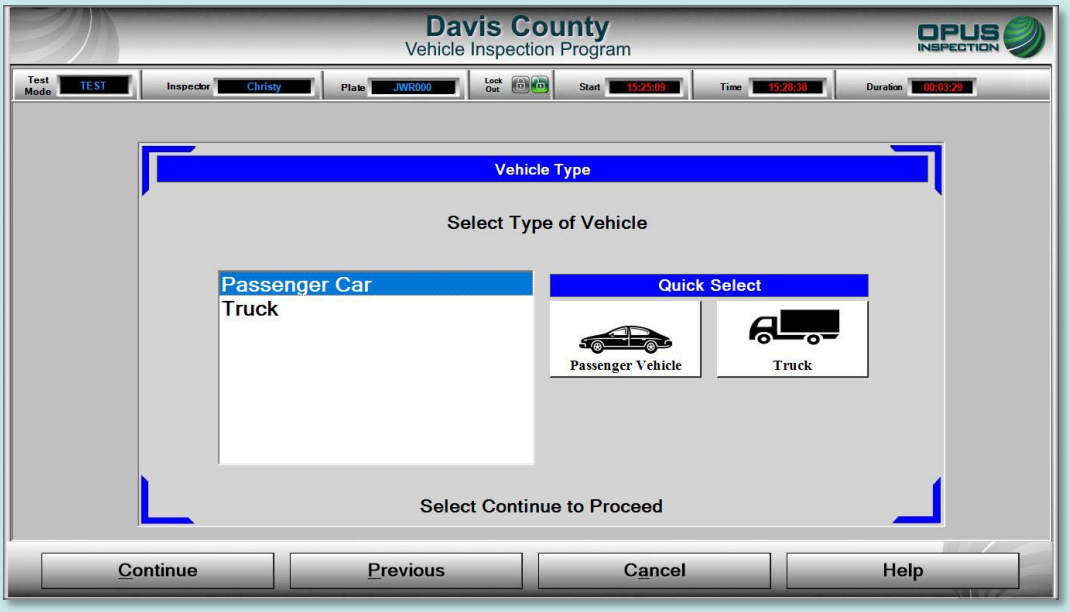
Figure 24: Enter model year of vehicle



5.1.7 Vehicle type entry

In the **Vehicle Type** screen (Figure 25), enter the type of vehicle by selecting **Passenger Car** or **Truck** in the left-side field or by clicking the appropriate icon under the **Quick Select** header. Click **Continue** when finished.

Figure 25: Enter vehicle type

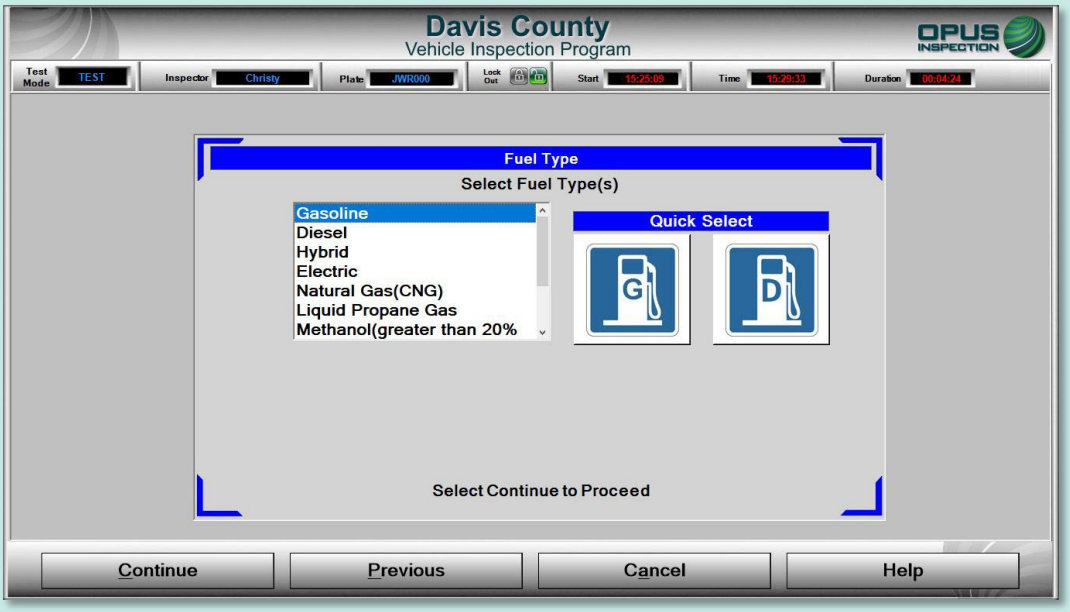


5.1.8 Fuel type entry

In the **Fuel Type** screen (Figure 26), select the vehicle's fuel type from the list at the left-side of the screen or click the appropriate icon under the **Quick Select** header, then **Continue**.

Note that a third field is available for entering data for vehicles that are bi-fuel capable. You may be prompted with a pop-up box to confirm the vehicle's bi-fuel status.

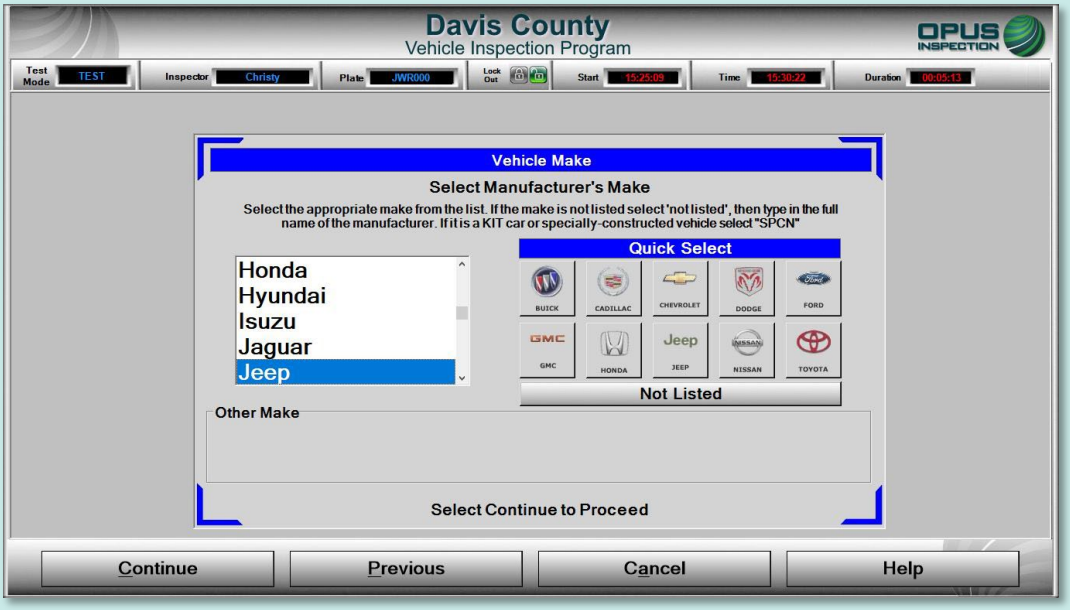
Figure 26: Select fuel type



5.1.9 Vehicle make entry

On the **Vehicle Make** screen (Figure 27), select vehicle make from the scrollable list on the left side of the screen or from the **Quick Select** icons on the right. Click **Continue** to proceed. If the vehicle's make is not listed, click **Not Listed** under the **Quick Select** icons. A field will appear for manually entering the vehicle make.

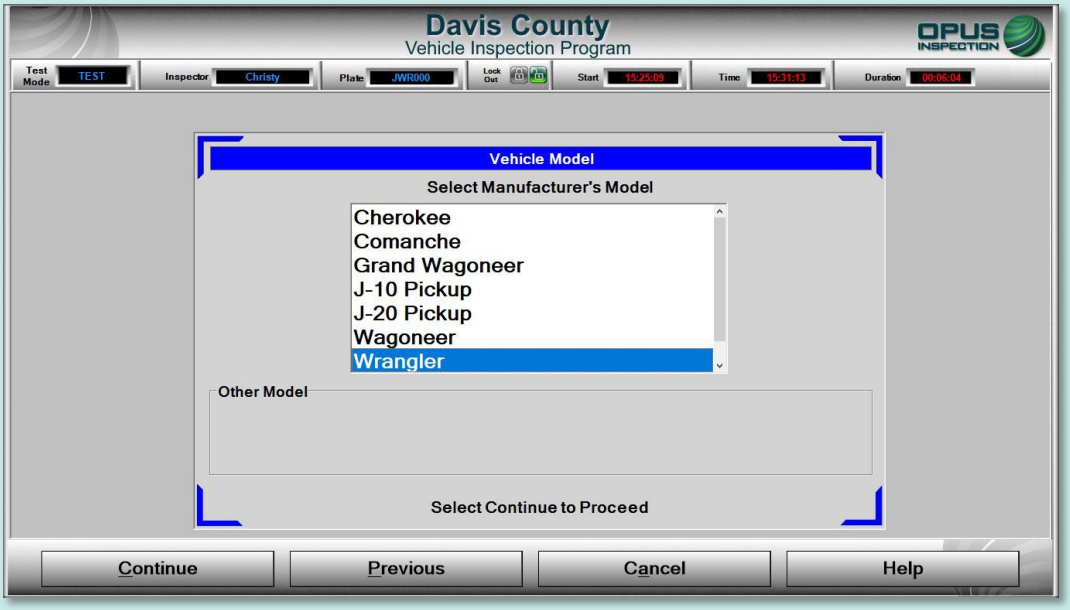
Figure 27: Select vehicle make



5.1.10 Vehicle model entry

From the **Vehicle Model** screen (Figure 28), select the vehicle's model from the scrollable list, then click **Continue**.

Figure 28: Enter vehicle model



5.1.11 Additional manual entry screens

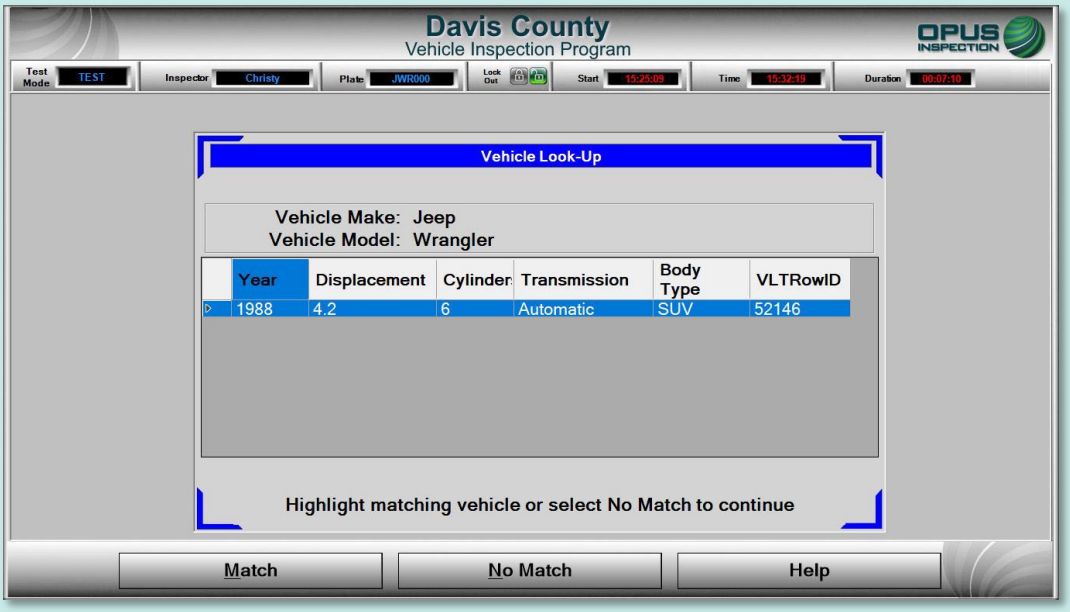
For those vehicles where vehicle data is unavailable from lookup tables, additional manual entry of vehicle parameters may be required. As necessary, you will be stepped through entry of engine displacement, number of engine cylinders, transmission type, vehicle body style, and the odometer reading. Click **Continue** to proceed to the next step in the inspection process or **Previous** to access the prior screen.

5.1.12 Vehicle lookup table match selection

The **Vehicle Look-Up** screen (Figure 29) displays the vehicle's make, model, year, displacement, number of cylinders, transmission type, body type, and vehicle lookup table (VLT) row ID. If the information displayed matches the vehicle under test, click **Match** to continue with the inspection process.

If the information displayed on the screen does not match, click **No Match**. You will be prompted through a series of screens to enter the vehicle data manually.

Figure 29: Vehicle lookup and match screen



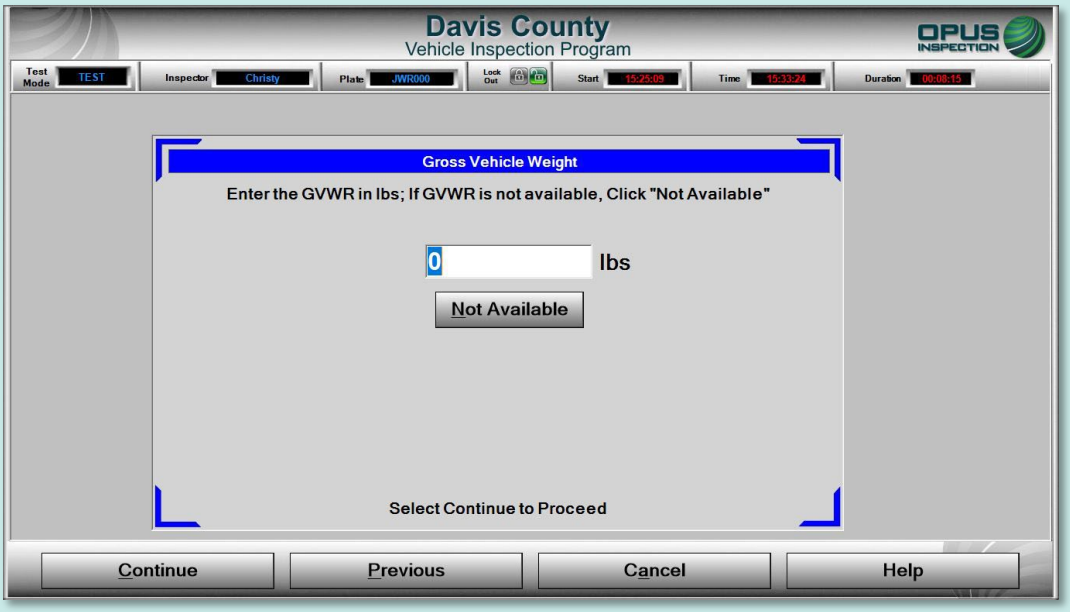
5.1.13 Vehicle weight class entry

On the **Gross Vehicle Weight** screen (Figure 30), enter the vehicle's gross vehicle weight. If the gross vehicle weight is not available, click **Not Available** and the inspection system will fill in the field with a default number (5999). Click **Continue** to proceed with the inspection.

The GVWR is typically located near the vehicle's VIN—that is, on the driver's side doorjamb or under the hood.

Some vehicles requiring manual entry of data will cause additional instructions to pop up when you click **Not Available** These instructions will direct you to enter a default weight number depending on the vehicle make, model, or other parameters.

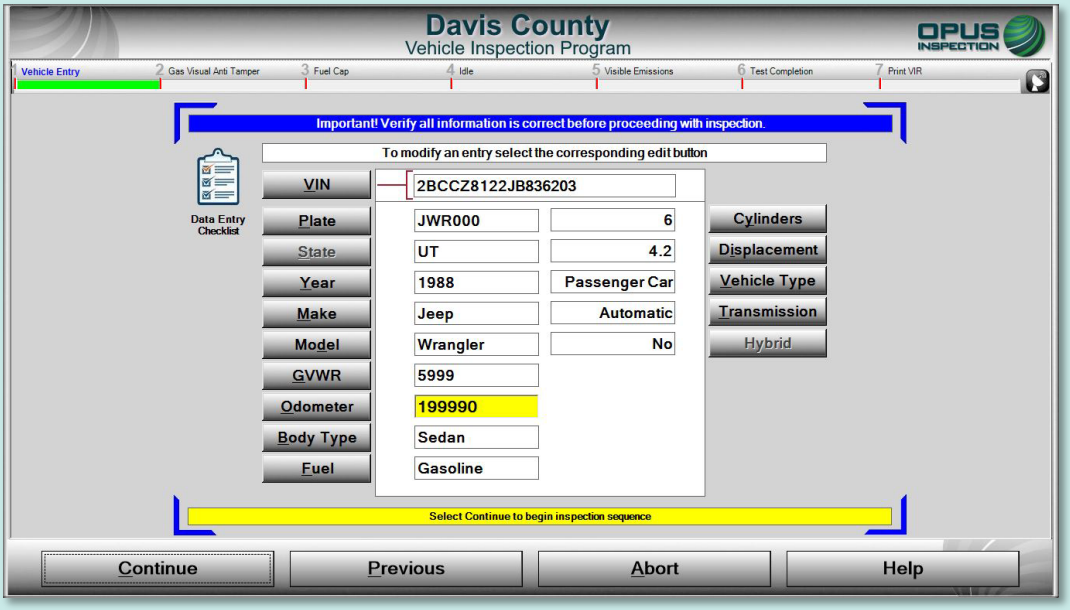
Figure 30: Enter gross vehicle weight



5.1.14 Verify information and enter odometer reading

The **Verify all information** screen (Figure 31) provides a data entry checklist. Review each entry carefully before clicking **Continue**. If it has not yet been recorded, enter the **Odometer** reading in the field provided. Also, correct any errors that appear in the data fields shown on the screen by clicking on the button to the left or right of the appropriate data field.

Figure 31: Verify all information screen



5.1.15 Visual anti-tampering inspection

The visual anti-tampering inspection process for gasoline and diesel vehicles involves visually confirming the presence of mandatory components (catalytic converter and O_2 sensor) and other emissions-related devices.

As with the data verification process, taking photos for documenting anti-tampering compliance is a two-step process, as described below:

- Unplug the handheld camera and take photos of the indicated devices.
- When all required photos have been taken, plug in the handheld camera to the PC and click **Take Pictures** button (see Figure 32), followed by **Connect** (look for the red camera icon) on the next screen (Figure 33) to access the photos on the camera. Follow the instructions on the screen for connecting and powering up the camera.

Figure 32: Gas visual anti-tampering inspection screen

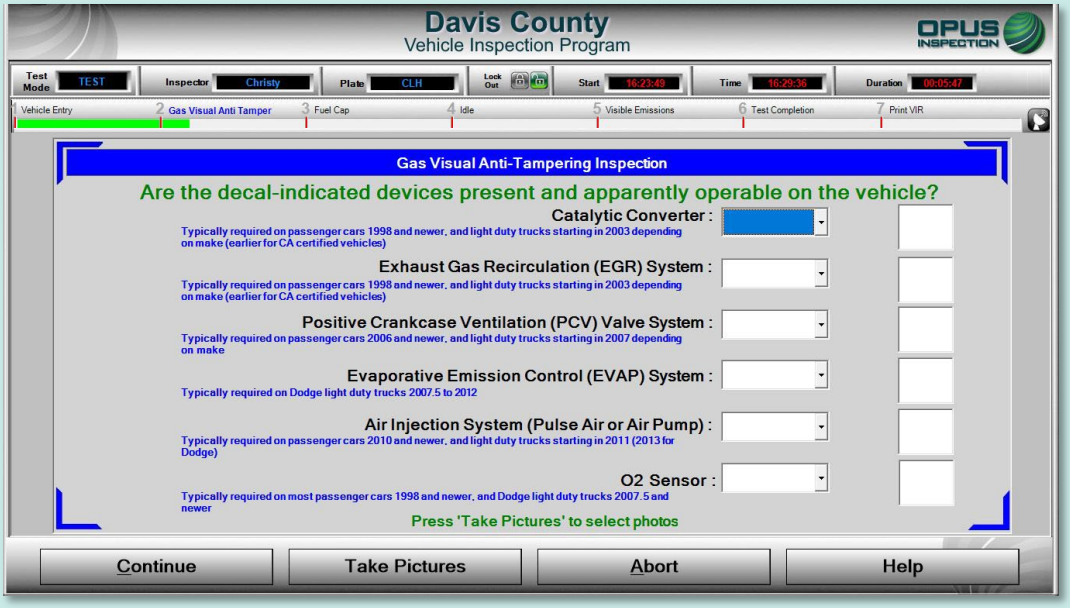
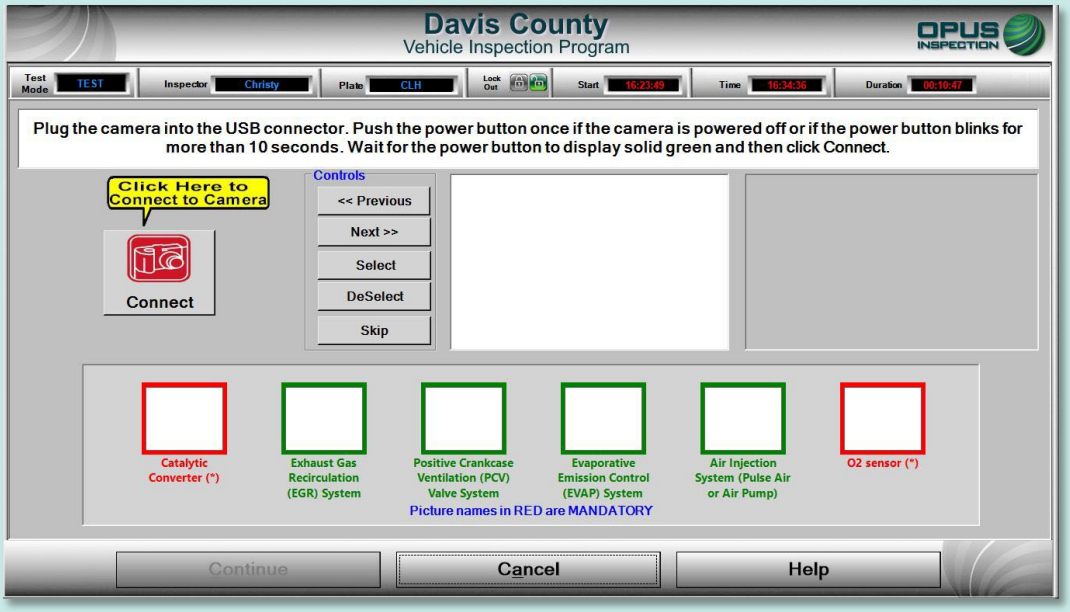


Figure 33: Visual inspection—connecting the camera



Use the buttons on the screen to assign the different photos to the correct description (Figure 34 and Figure 35). Click **Continue** when all photos have been assigned. The photos will automatically be deleted from the camera after the process is complete.

Figure 34: Visual inspection—loading photo files into the system

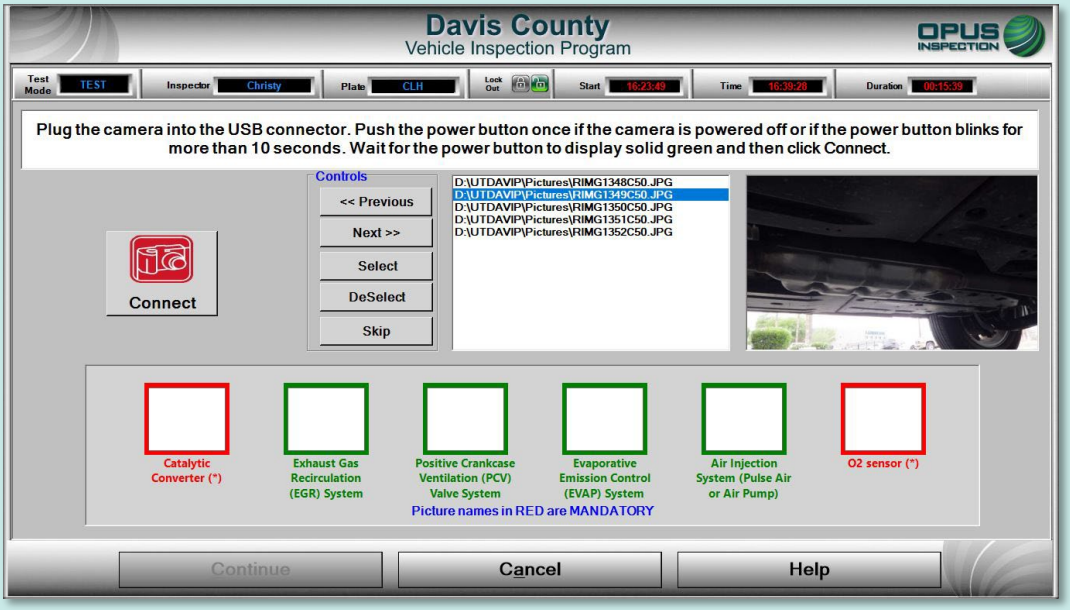
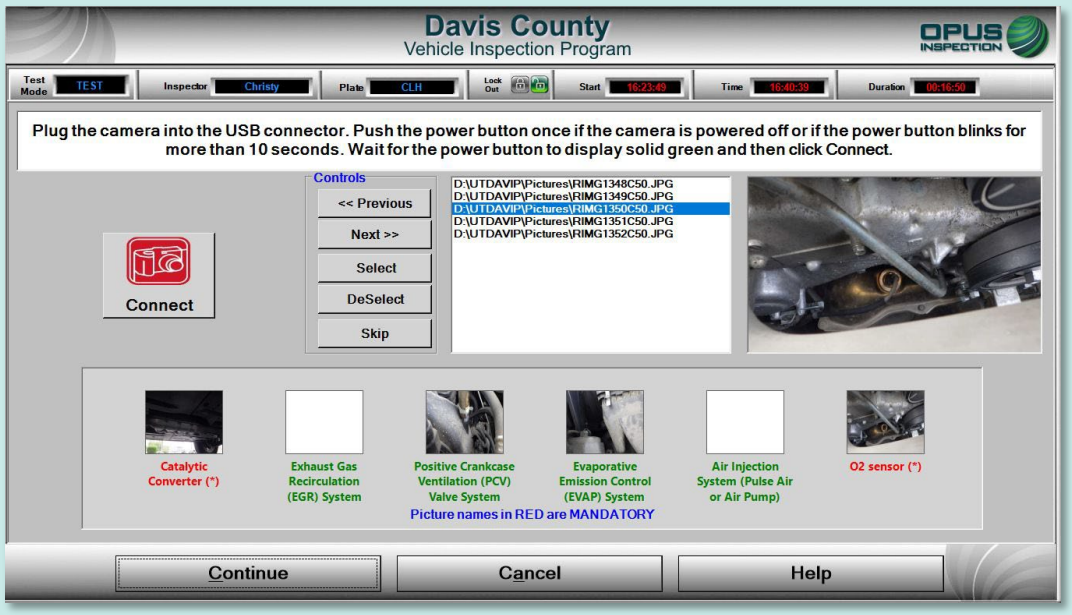
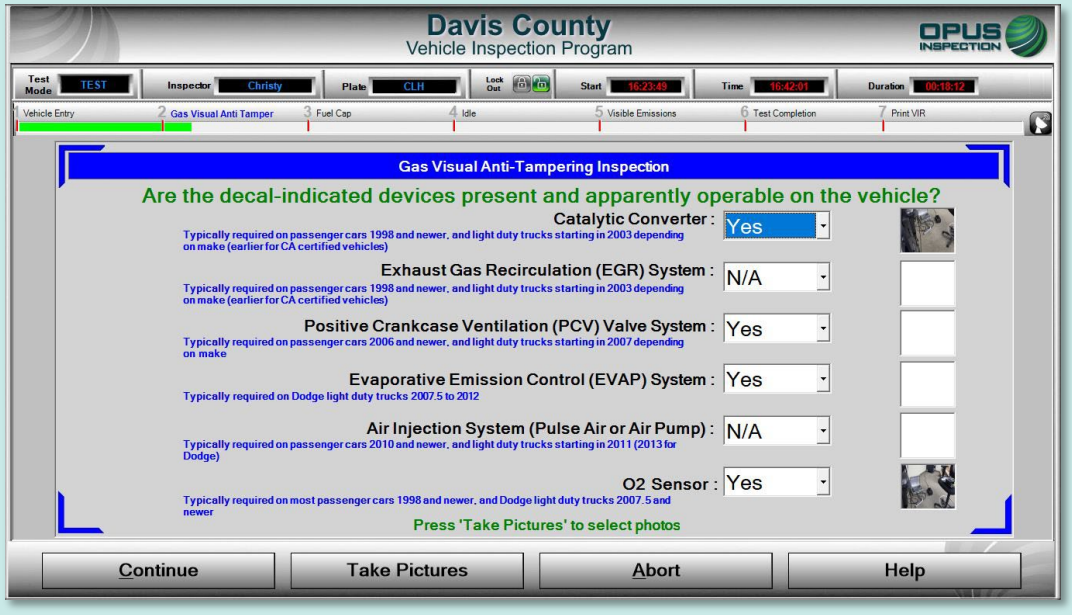


Figure 35: Visual inspection—photo selected for review



At the completion of the visual anti-tampering inspection process, answer all questions on the inspection screen (Figure 36) and click **Continue**.

Figure 36: Visual inspection—Anti-tampering inspection completed



5.1.16 Gas cap visual inspection

The gas cap visual inspection process follows the visual anti-tampering inspection. The screens (Figure 37) and (Figure 38) will walk you through the process.

Figure 37: Gas cap visual inspection procedure

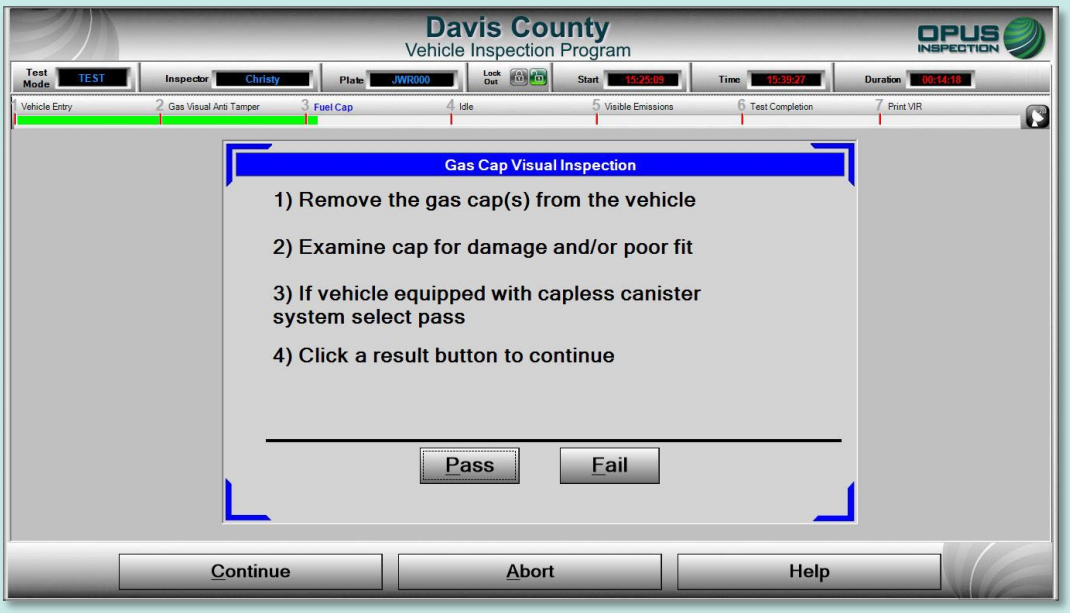
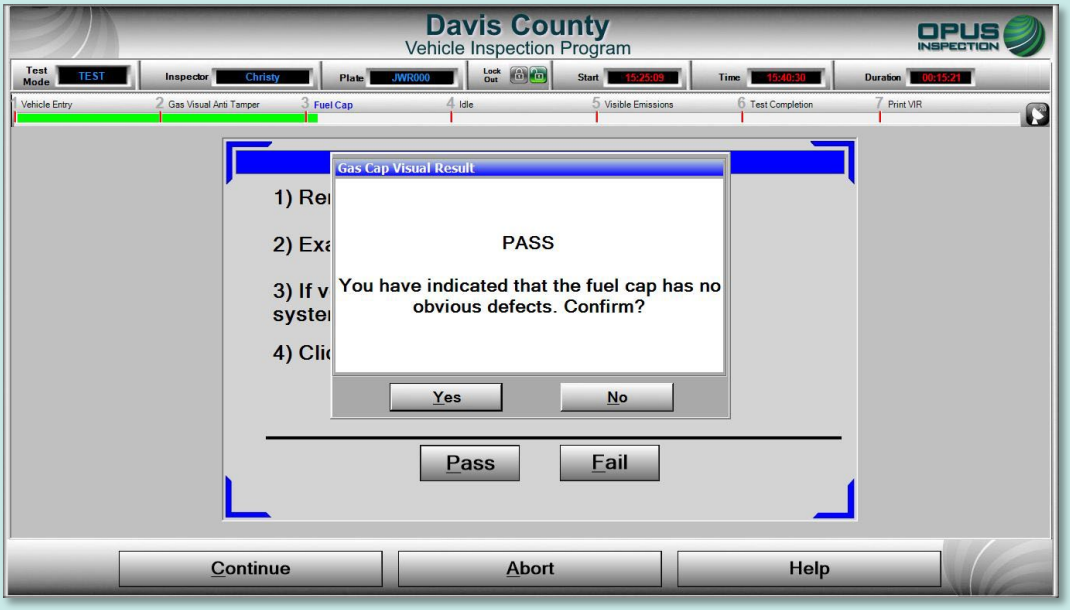


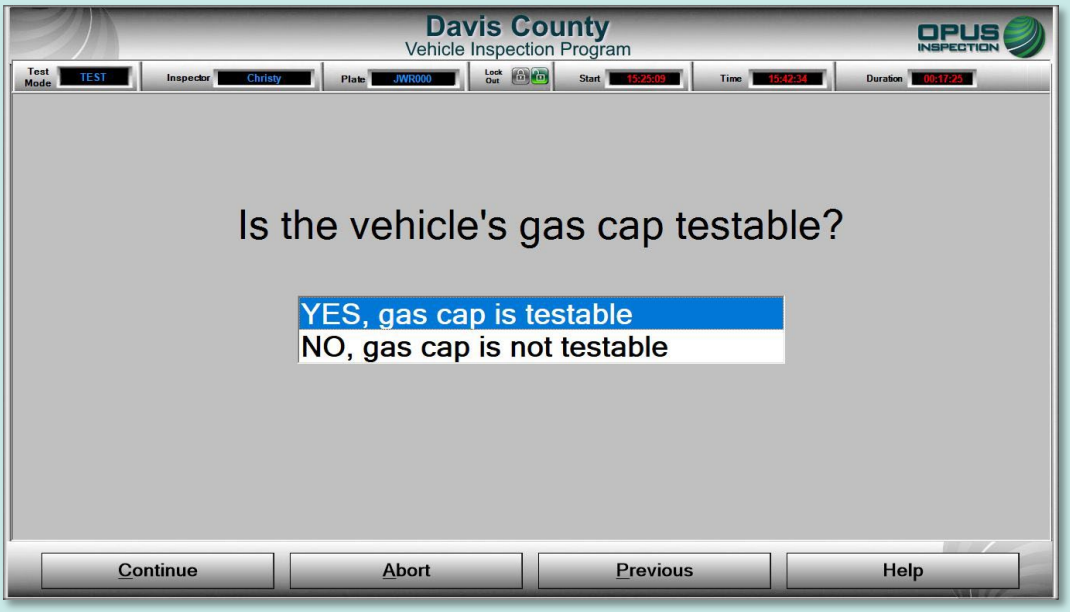
Figure 38: Gas cap visual inspection—Prompt to confirm pass



Two additional questions, as seen in (Figure 39) and (Figure 40), need to be answered before proceeding to the gas cap pressure test.

Figure 39: Gas cap visual inspection—Prompt to determine if gas cap is missing

Figure 40: Gas cap visual inspection—Prompt to determine if gas cap is testable



5.1.17 Gas cap pressure test

Follow the instructions on the screen (Figure 41) for connecting the correct adapter and running the gas cap pressure test. When a passing test has been completed, you will be prompted to be sure to remove the adapter and replace the vehicle's gas cap (Figure 42). Click **Continue** to proceed.

Figure 41: Gas cap pressure test—Prompt to attach adapter

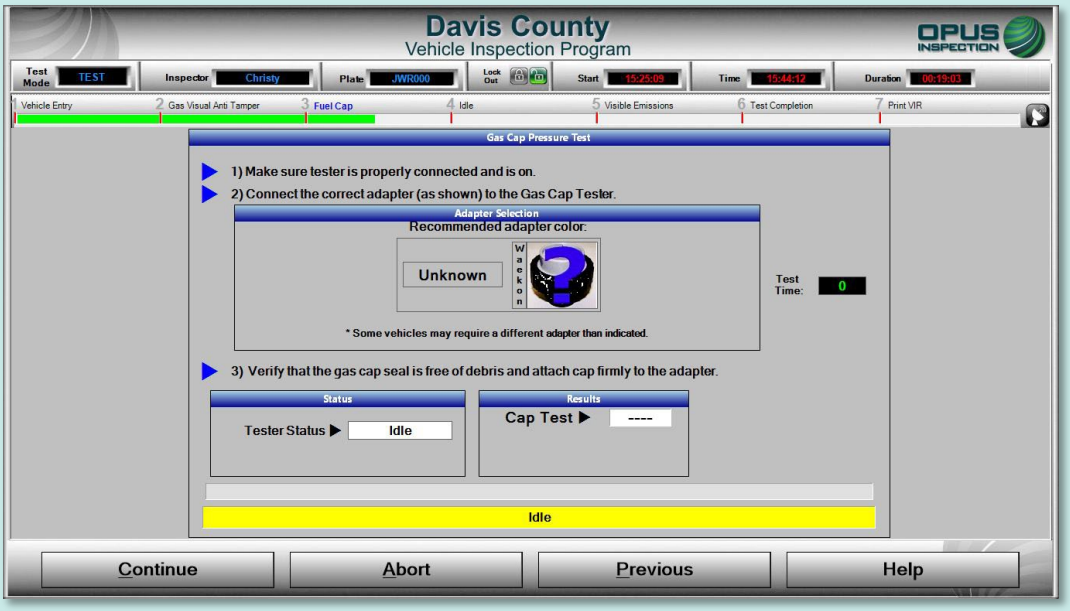
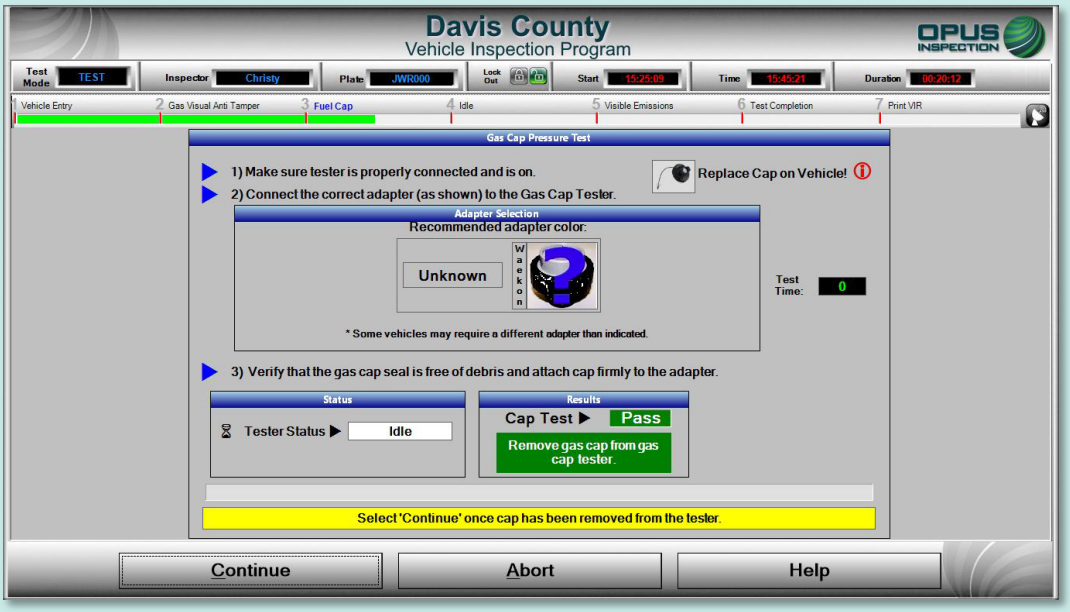
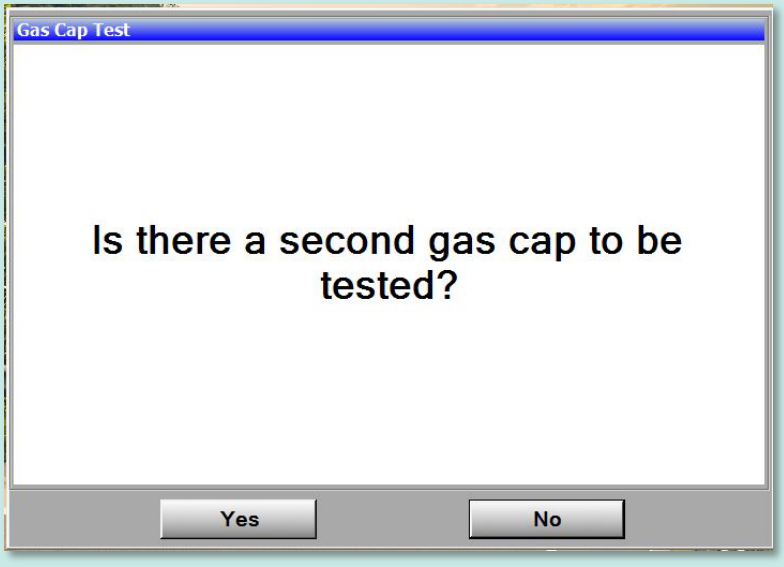


Figure 42: Gas cap pressure test—Passing test, prompt to remove adapter



Following the gas cap pressure test, you will be prompted to determine if a second gas cap needs to be tested (Figure 43). Click **Yes** to repeat the gas cap pressure test for the second gas cap or **No** to continue to the next step in the vehicle inspection process.

Figure 43: Gas cap pressure test—Prompt for second gas cap



5.1.18 MIL lamp status

On the **OBD Dashboard MIL (Check Engine) light verification** screens, follow the directions for **KOEO** (Figure 44) and **KOER** (Figure 45) checks, selecting **Yes** or **No** depending on the outcome. The inspection system will proceed to the next screen following the **KOER** check.

Figure 44: OBD Dashboard MIL Verification-KOEO

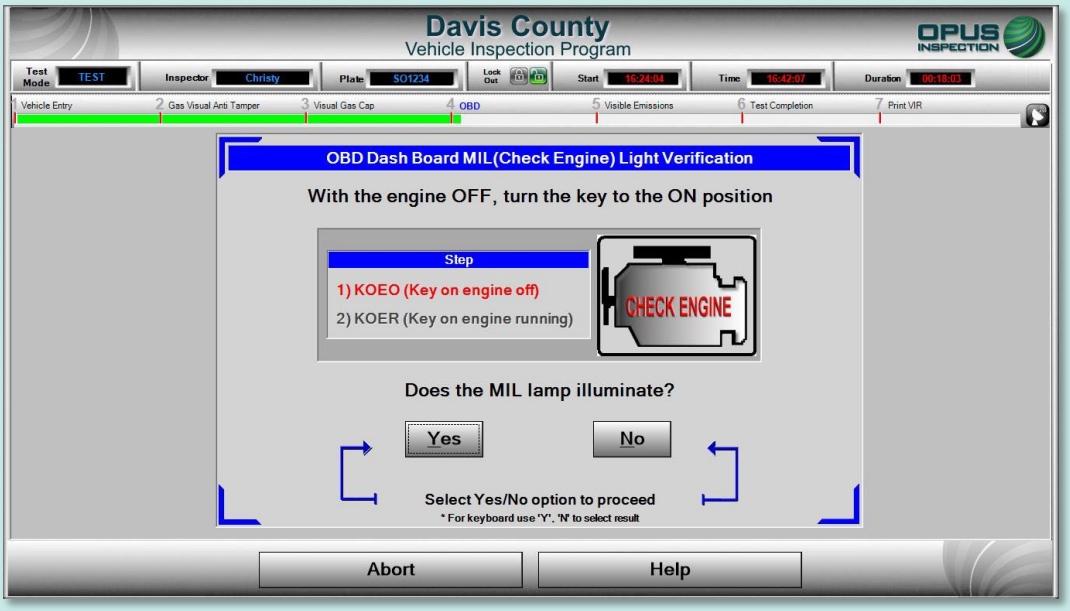
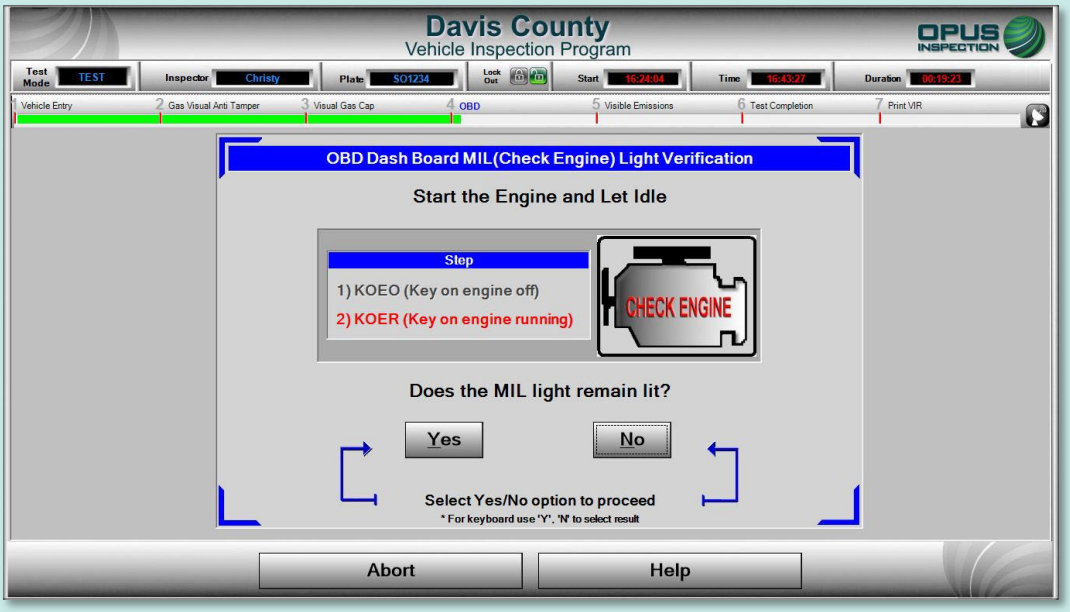


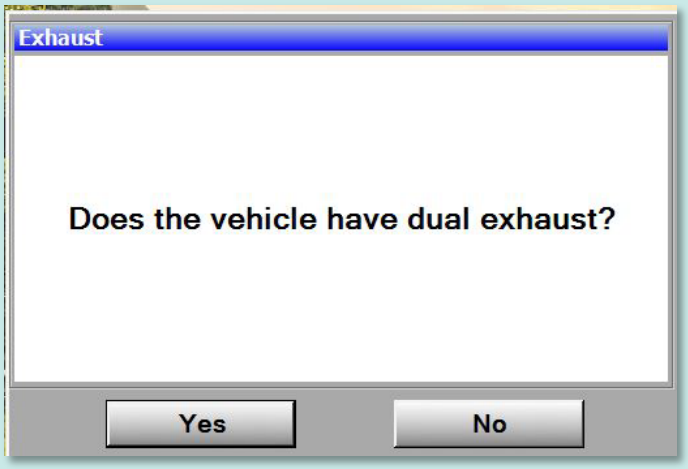
Figure 45: OBD Dashboard MIL Verification-KOER



5.1.19 TSI emissions test

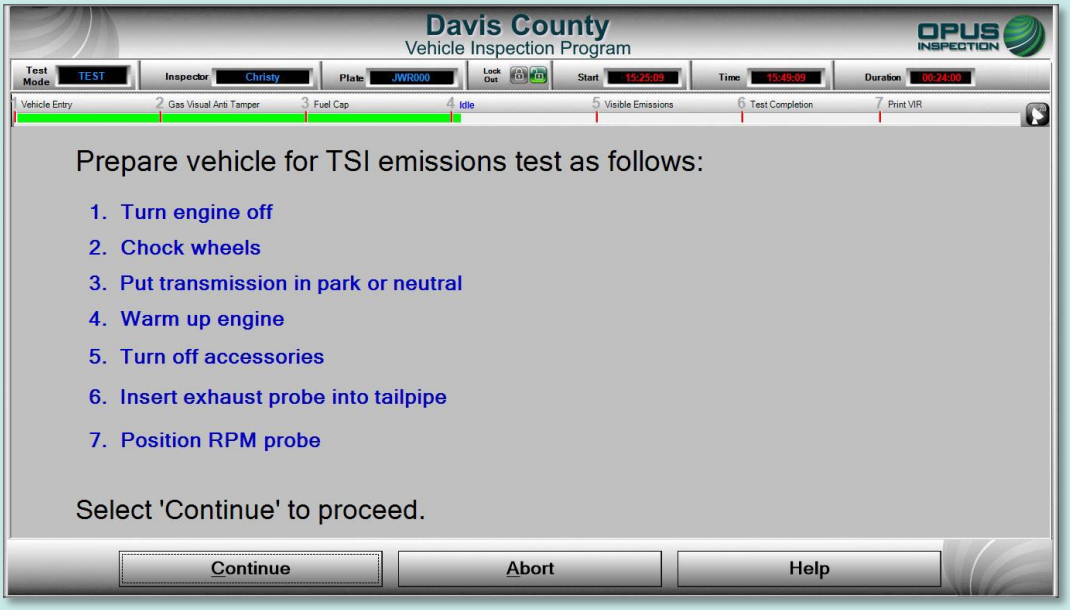
A preliminary step prior to initiating the TSI emissions test is to determine whether the vehicle under test has dual exhaust. Click Yes or No when the prompt appears on the screen (Figure 46).

Figure 46: Prompt to determine vehicle with dual exhaust



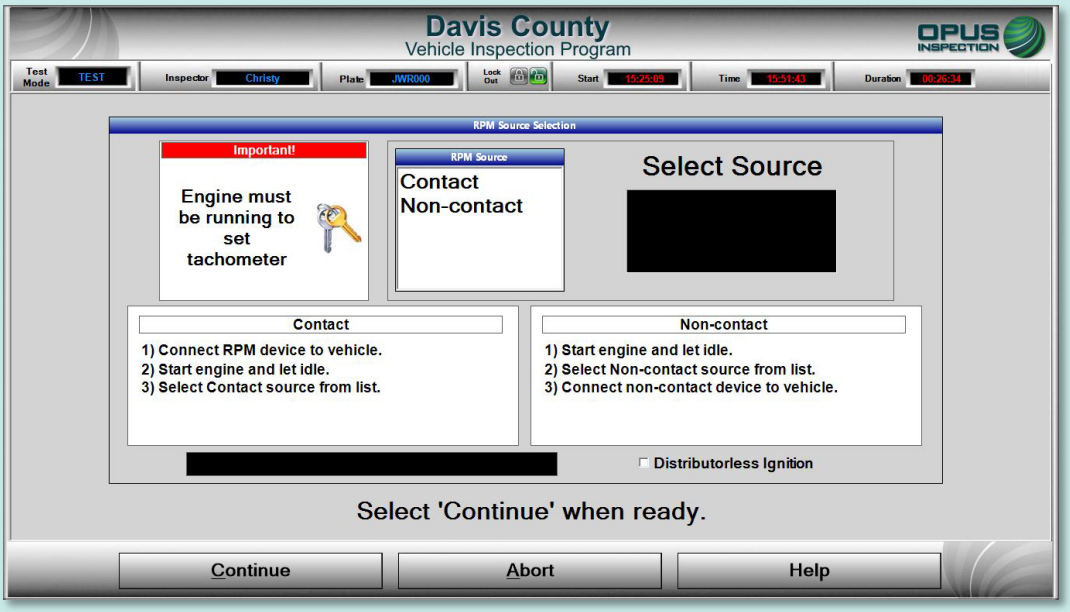
The first step of the TSI emissions test is to prepare the vehicle. Follow the instructions on the screen (Figure 47) and click **Continue**.

Figure 47: TSI emissions test—preparing the vehicle



Select the RPM source—**Contact** or **Non-contact**—on the next screen (Figure 48) then click **Continue**.

Figure 48: TSI emissions test—Selecting RPM source



The software will walk you through the 2500 RPM Test (Figure 49) followed by the 500 RPM Test (Figure 50). Should any failures be encountered during this sequence, you will be asked if you wish to abort the test.

Figure 49: TSI emissions test—2500 RPM Test

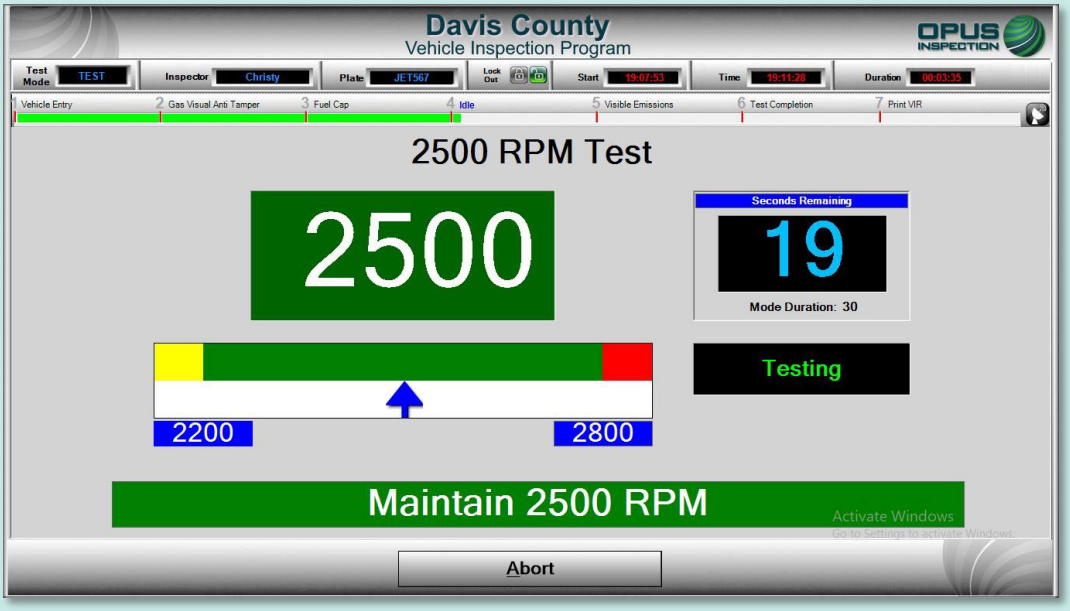
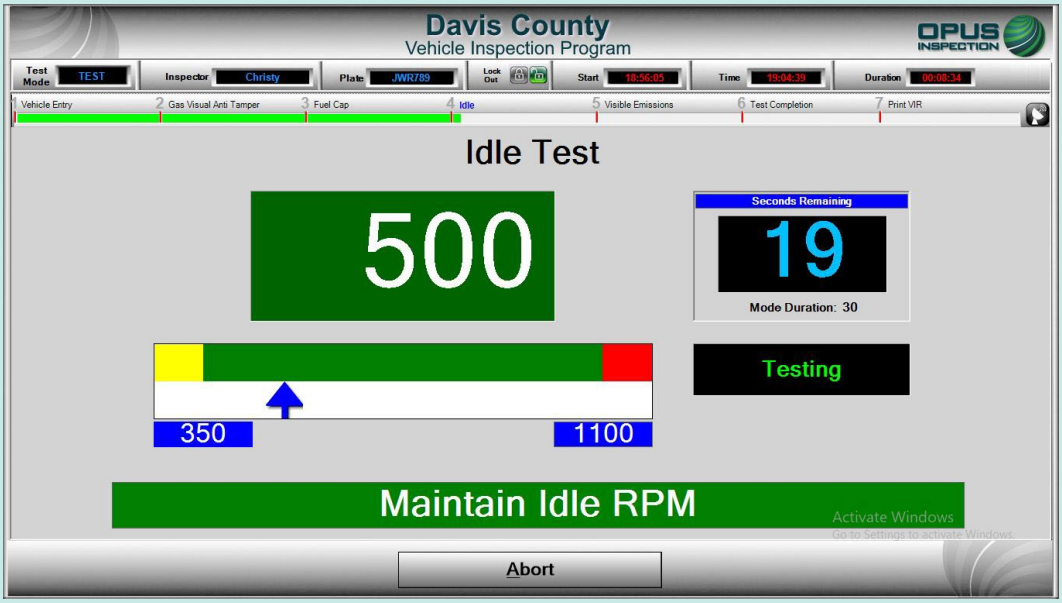
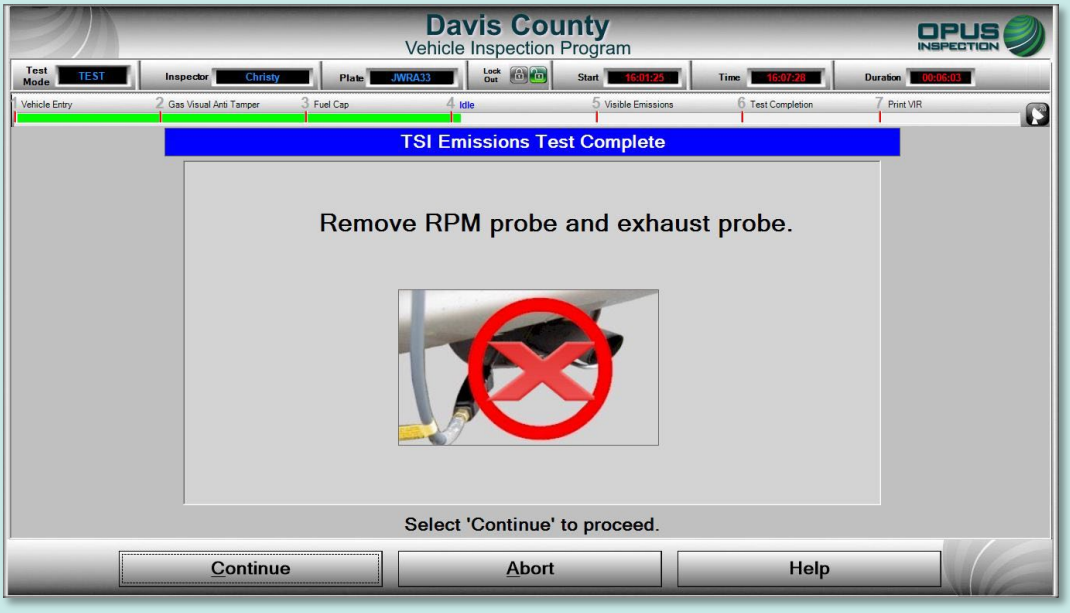


Figure 50: TSI emissions test—500 RPM Test



When the TSI emissions test has been completed, you will be prompted to remove the RPM and exhaust probes (Figure 51).

Figure 51: TSI emissions test—Test complete, prompt to remove probes



5.1.20 Visible emissions check

On the **Visible Emissions Check** screen (Figure 52), indicate whether the vehicle produced visible emissions by selecting **Yes** or **No.** A pop-up box will appear prompting for confirmation (Figure 53). When confirmed, click **Continue** to proceed to the final step in the inspection process. (A **Yes** answer to the visible emissions question will result in a failed inspection regardless of the outcome of the OBD test.)

Figure 52: Visible emissions check

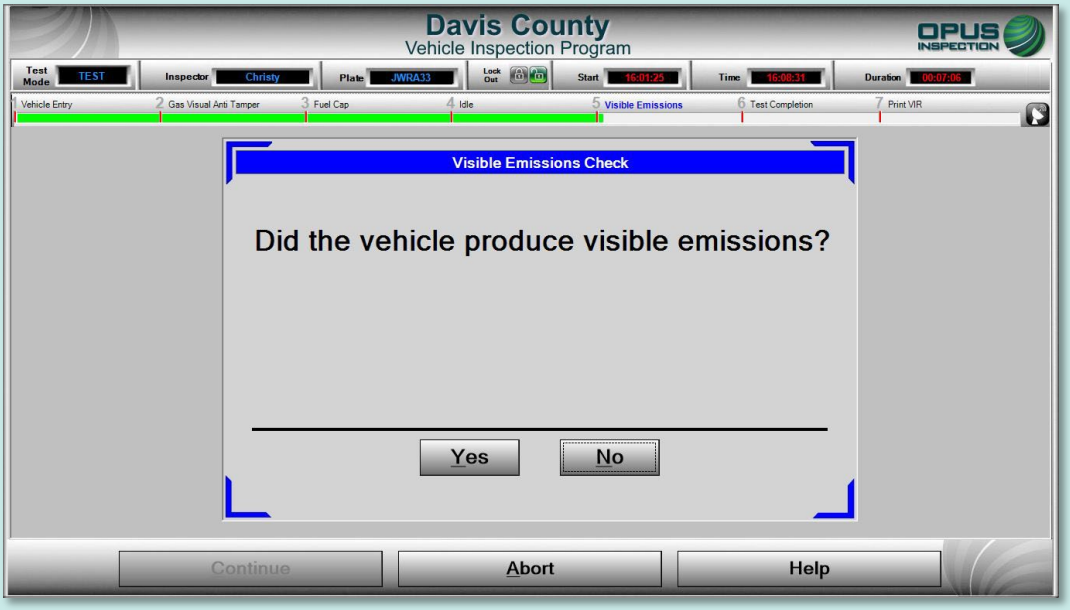
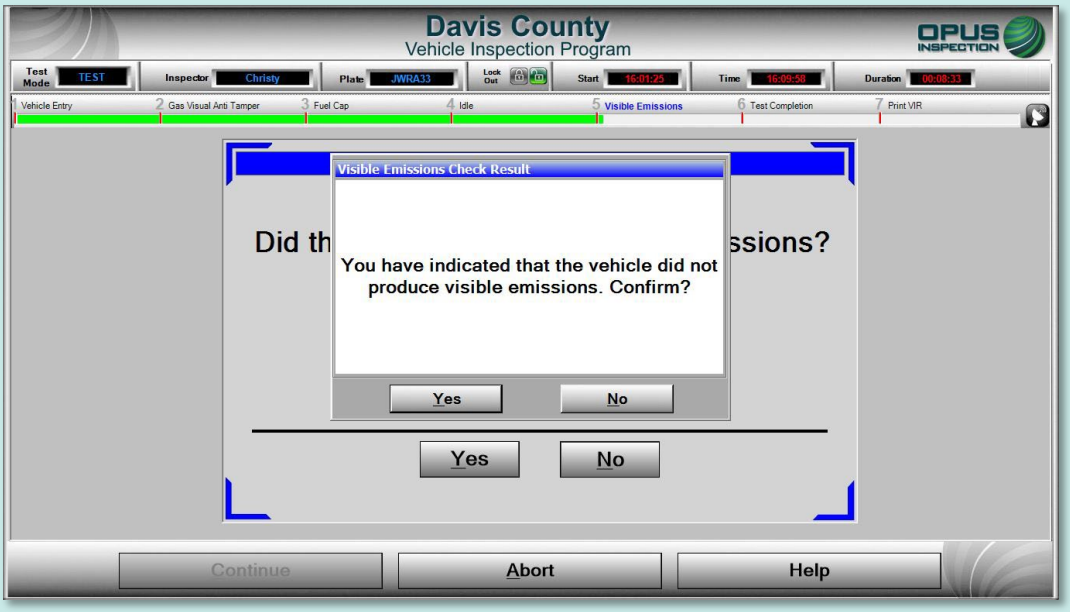


Figure 53: Visible emissions check—Confirm Yes or No



5.1.21 Printing the vehicle inspection report (VIR)

The final screen displays a copy of the **vehicle inspection report** (VIR) of the inspection result. The VIR is automatically sent to the printer.

The examples below depict a vehicle that has passed both the I/M and visual inspections (Figure 54) and one that passed the I/M portion of the inspection but failed the visual (Figure 55).

To print a second copy of the VIR, click **Reprint Form**. To conclude the inspection process, click **Continue**. The inspection system display will return back to the **Vehicle Inspection Menu**.

Figure 54: Vehicle Inspection Report (VIR)—Passing result

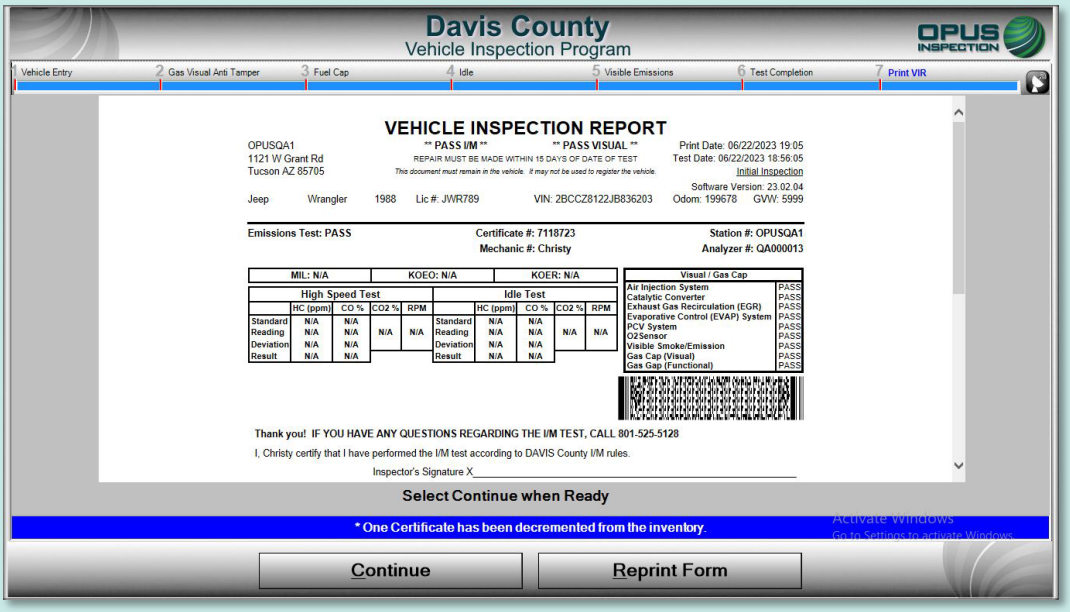
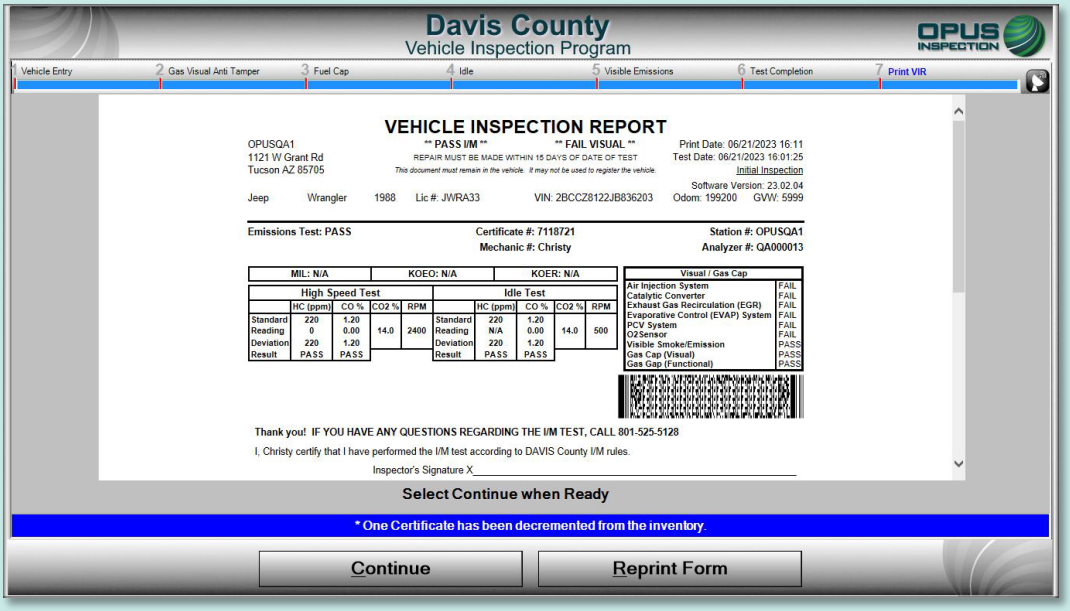


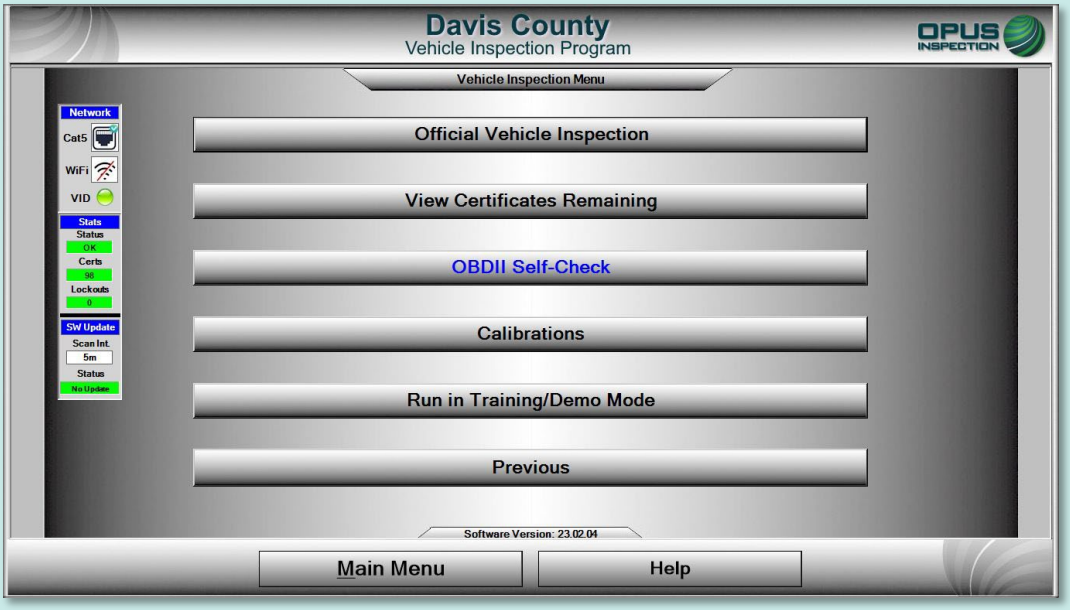
Figure 55: Vehicle inspection report (VIR)—Passed I/M but failed visual



5.2 Other vehicle inspection menu items

Besides the **Official Vehicle Inspection**, the **Vehicle Inspection Menu** (Figure 56) includes several additional utilities, as described in the subsections below.

Figure 56: Vehicle inspection menu



5.2.1 View certificates remaining

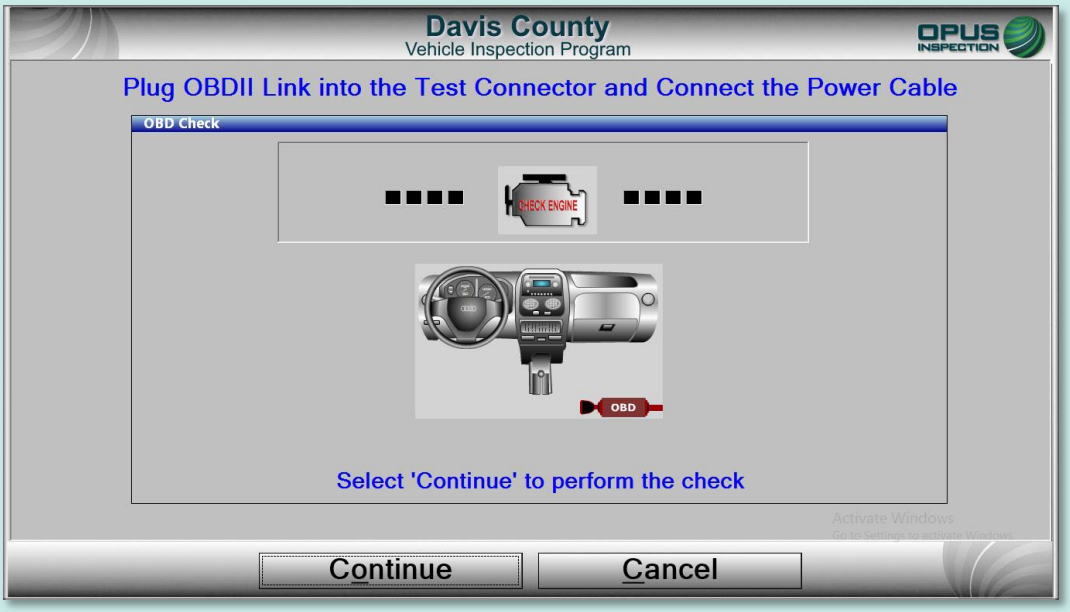
Clicking **View Certificates Remaining** provides a quick check of available stock (Figure 57).

Figure 57: Certificates remaining

5.2.2 OBD self-check

The **OBD Self-Check** function (Figure 58) offers a method to check the System's OBD link. Follow the instructions on the screen and click **Continue.** Click **OK** when the check has been completed to return to the Vehicle Inspection Menu.

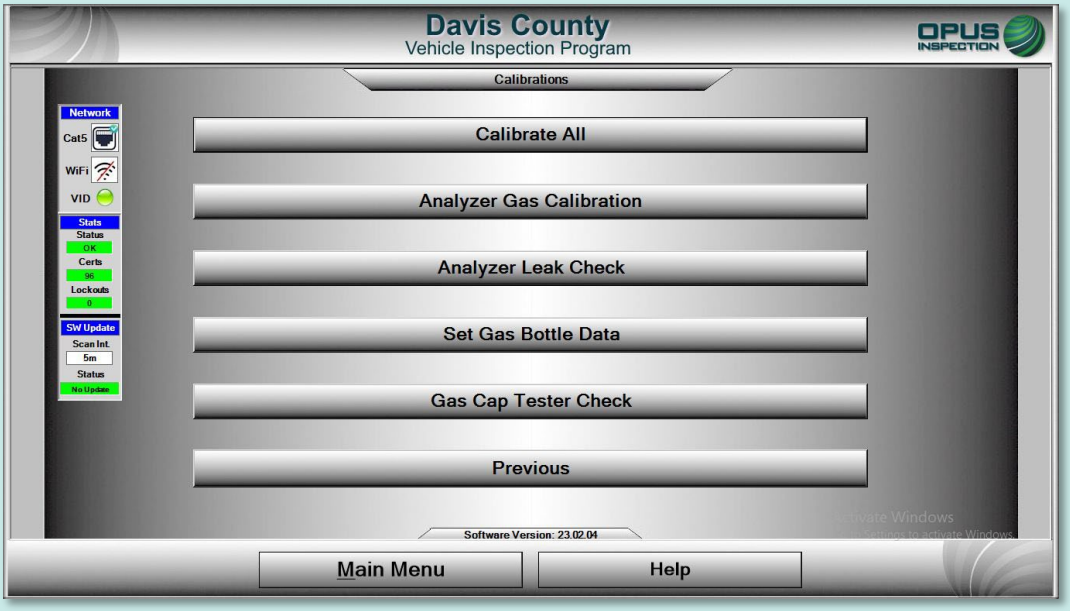
Figure 58: OBD Self-check



5.2.3 Calibrations

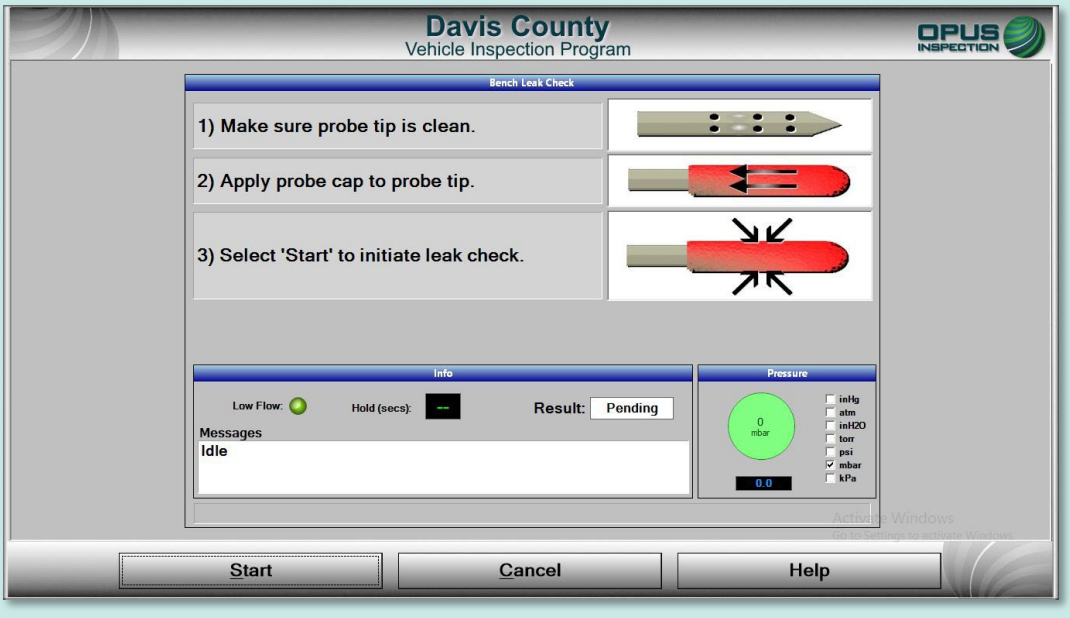
Calibrations for the Gen3 TSI/OBD-II System gas bench can be done for each individual component or via a full calibration sequence by selecting **Calibrate All** from the **Calibration Menu** (Figure 59).

Figure 59: Calibration menu



Initiate the bench leak check by following the instructions on the screen (Figure 60), including applying the probe cap to the probe tip. Click **Start** to initiate the check.

Figure 60: Calibration—Initiating bench leak check



In the event the bench leak check fails (Figure 61), you will be prompted with the option to repeat the check (Figure 62). Click **Yes** or **No** as appropriate.

Figure 61: Calibration—Bench leak check failure result

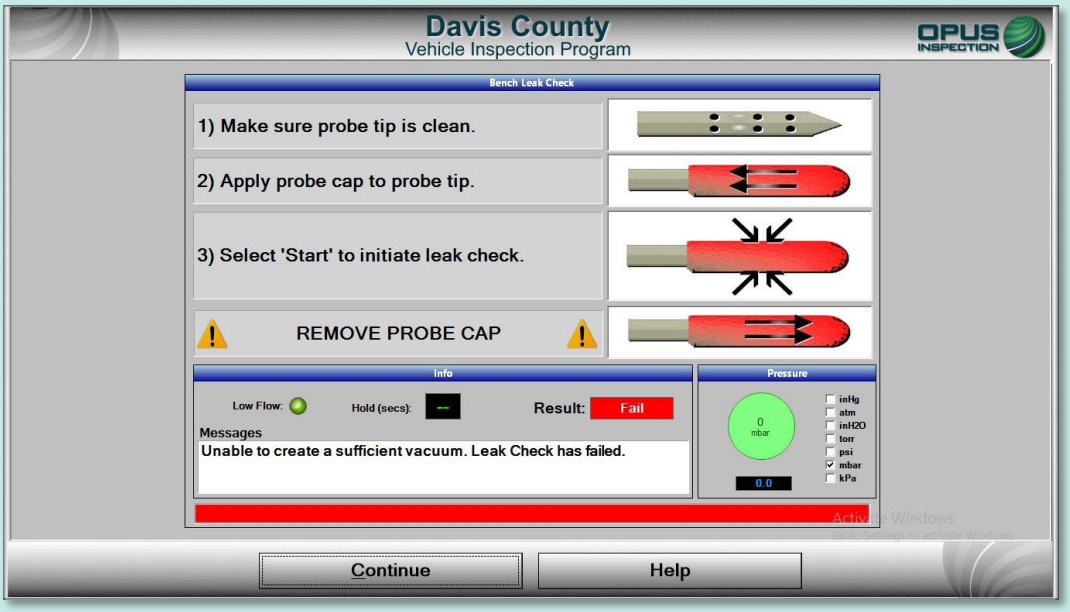
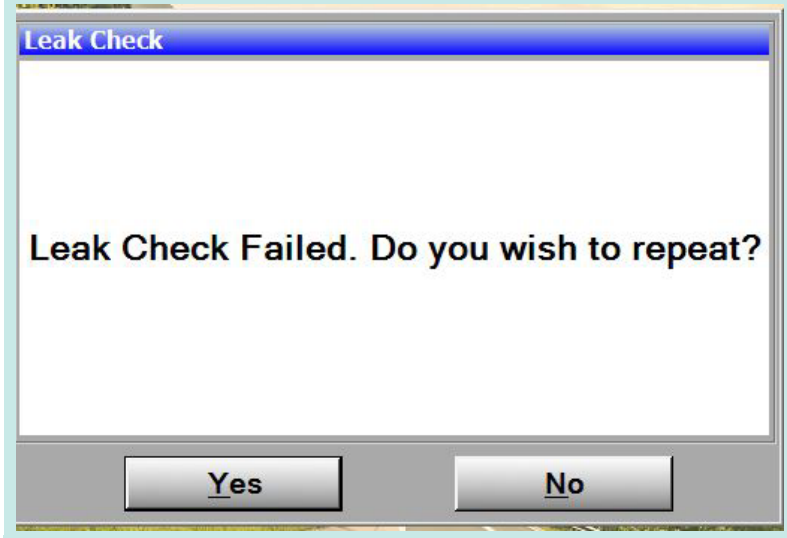
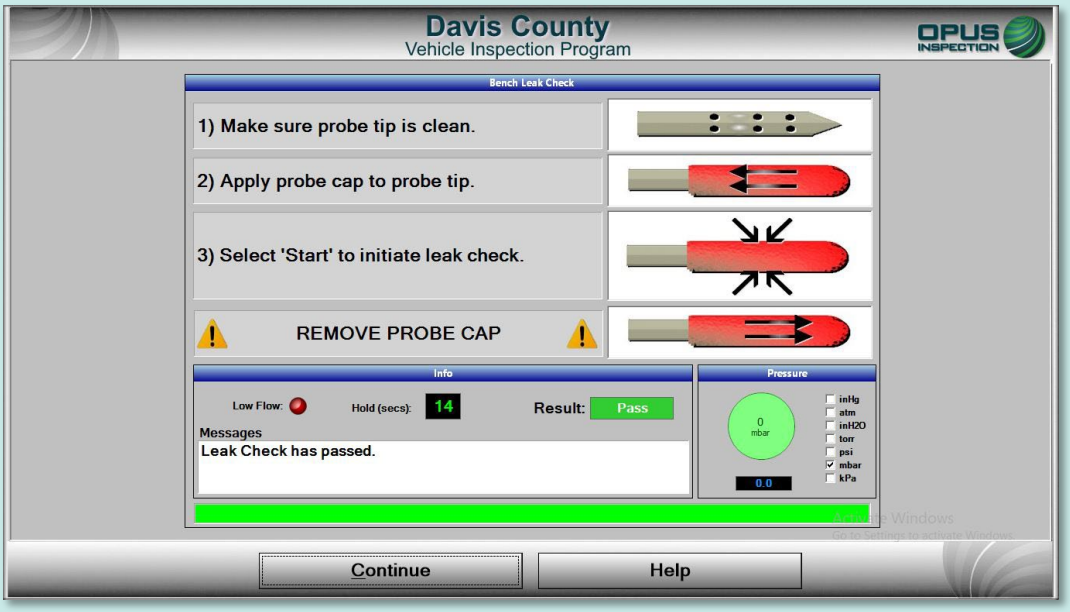


Figure 62: Calibration—Repeat leak check prompt



When the bench leak check has been completed and passed, you will be prompted to remove the probe cap (Figure 63).

Figure 63: Calibration—Leak check passed, remove probe cap



For Zero bottle (Figure 64) and High bottle (Figure 65) calibrations, values may be scanned with the barcode reader or entered manually. In each case, click **Save** to proceed to the next step.

Figure 64: Calibration—Zero bottle values

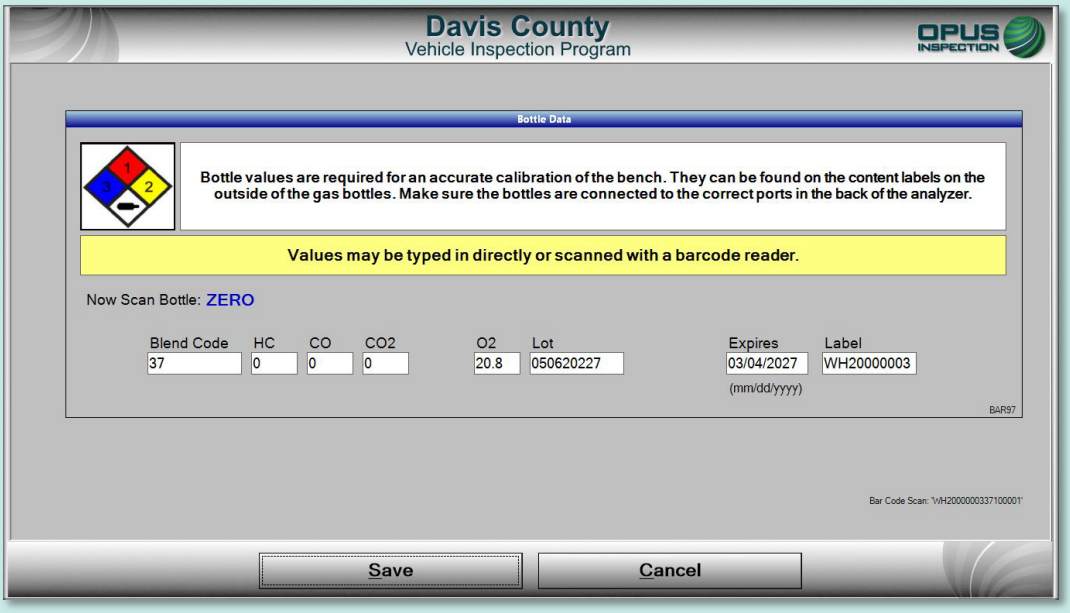
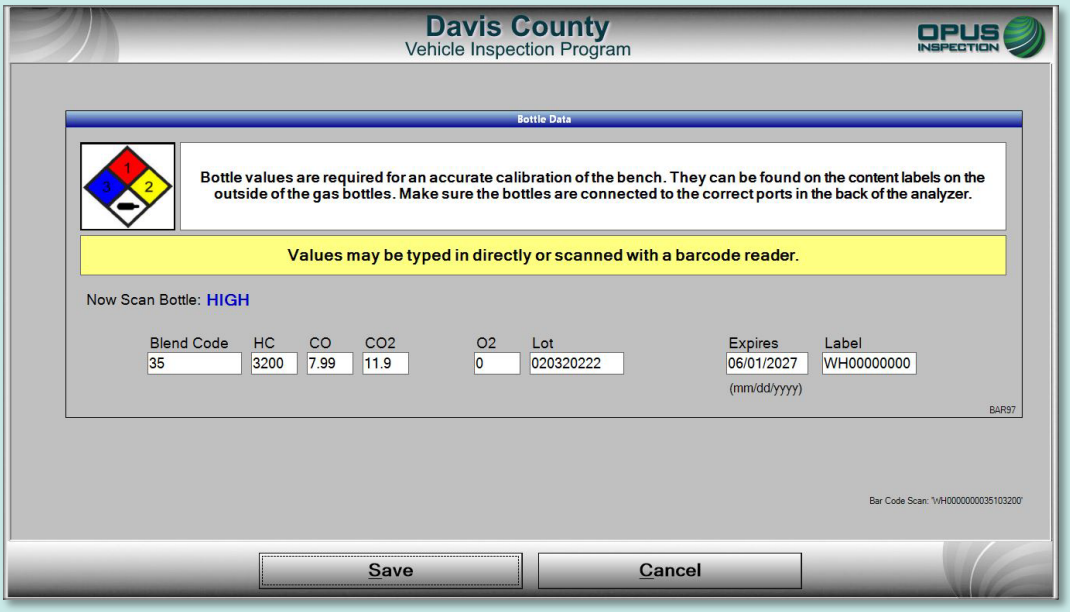


Figure 65: Calibration—High bottle scan



The final steps of the calibration process will be to confirm the opening of all bottles when prompted (Figure 66). Click **Continue** to proceed to the Auto-zero step (Figure 66).

Figure 66: Calibration—Prompt to open all bottles

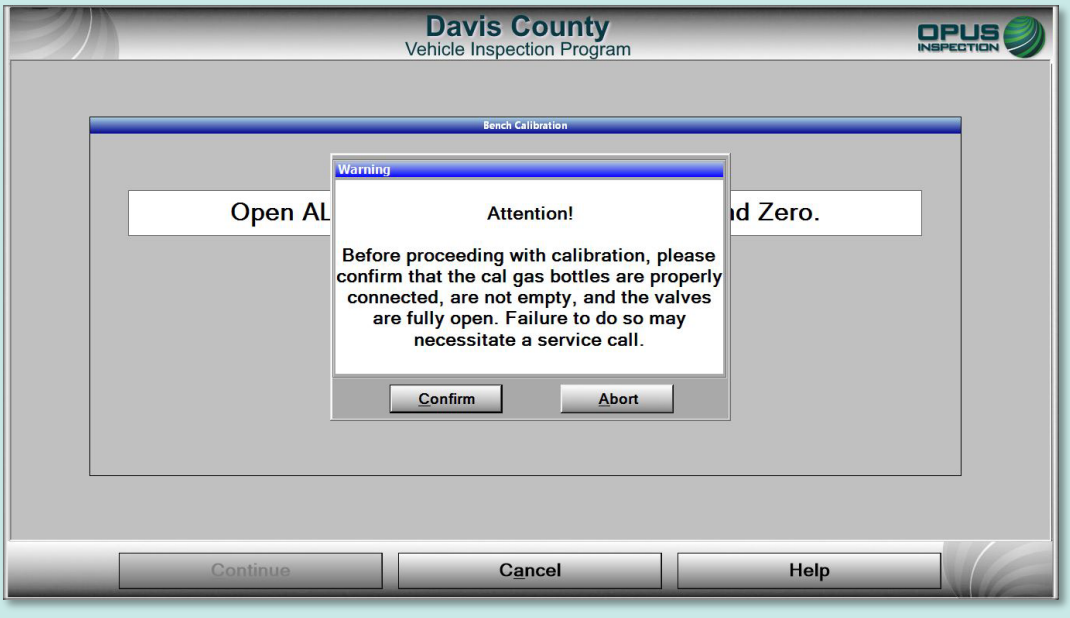
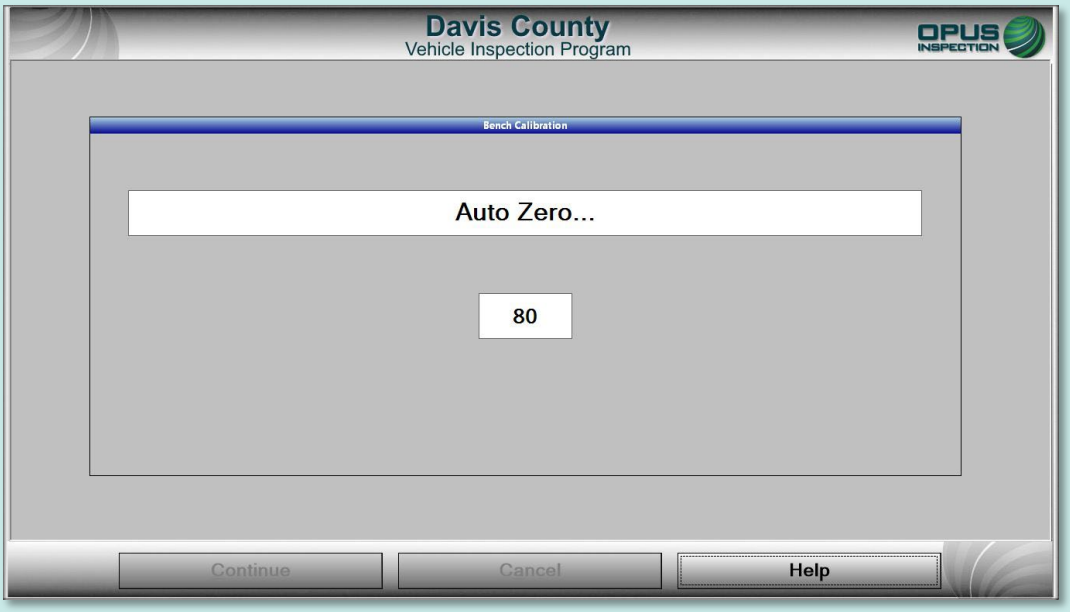
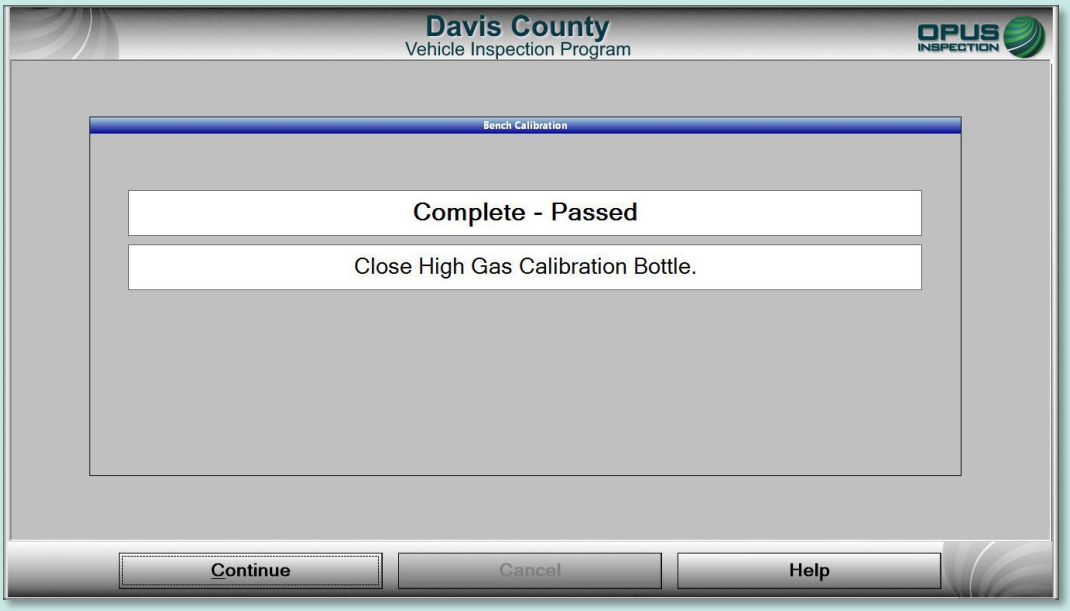


Figure 67: Bench calibration—Auto zero



When the bench calibration has passed (Figure 68) you will be prompted to close the high gas calibration bottle. Click **Continue** to proceed to the fuel cap tester checks.

Figure 68: Bench calibration passed—Prompt to close high calibration bottle



The fuel cap tester check is a two-step process, one for the green pass reference cap (Figure 69) and the other for the red pass reference cap (Figure 70). In each case, click **Continue** to proceed with the checks.

Figure 69: Calibration—Fuel cap tester check, green pass reference

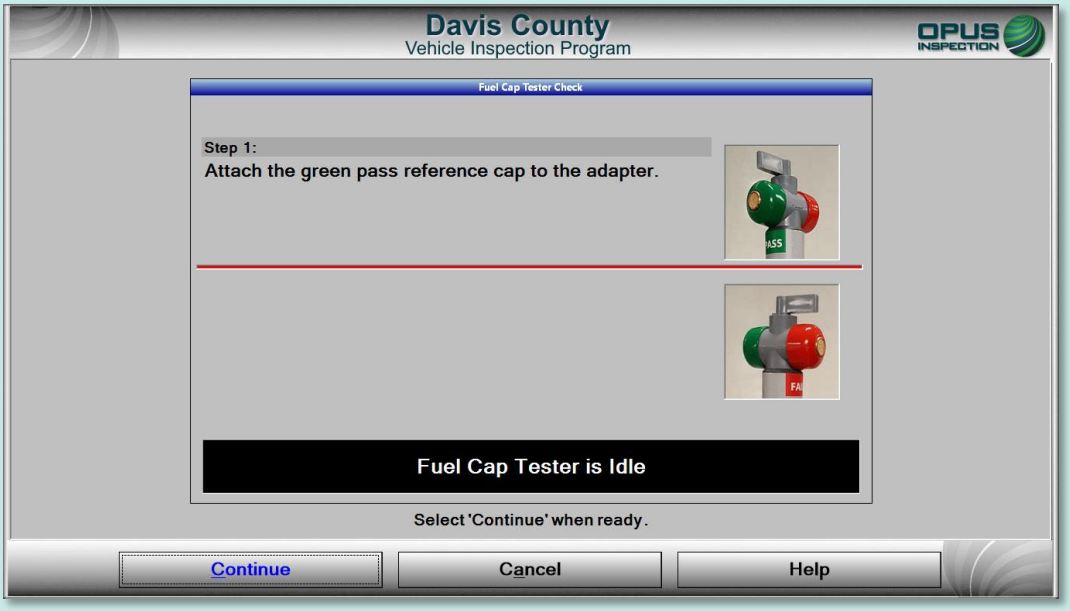
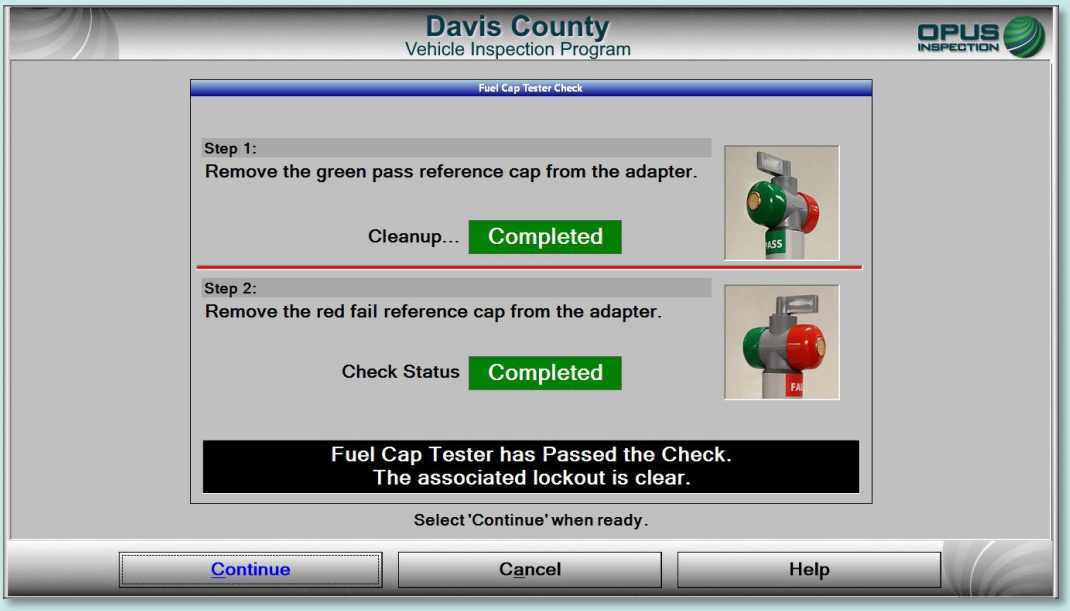


Figure 70: Calibration—Fuel cap tester check, red fail reference

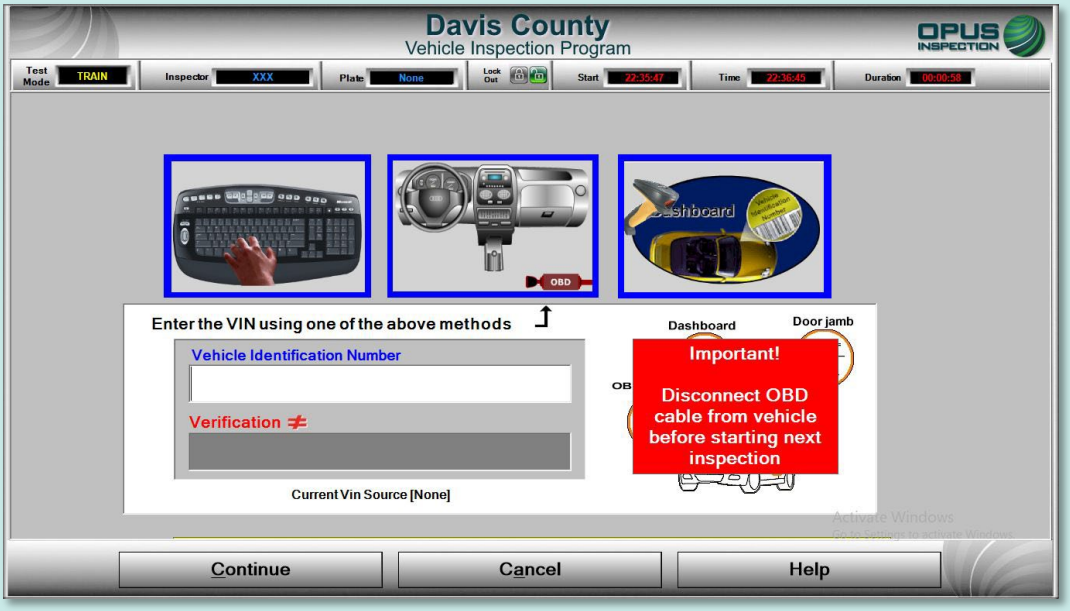


5.2.4 Running in Training/Demo mode

The inspection system provides users with the ability to run inspections in **Training/Demo Mode**. Training/demo mode emulates the official inspection process and connects with the VID, though no test results are recorded or reported.

Note in the example in Figure 71, **TRAIN** appears in **Test Mode** window on the dashboard at the top left of the screen.

Figure 71: Running inspection in training mode (enter plate number)



5.2.5 Previous

Clicking **Previous** from the **Vehicle Inspection Menu** returns the user to the **Main Menu**.

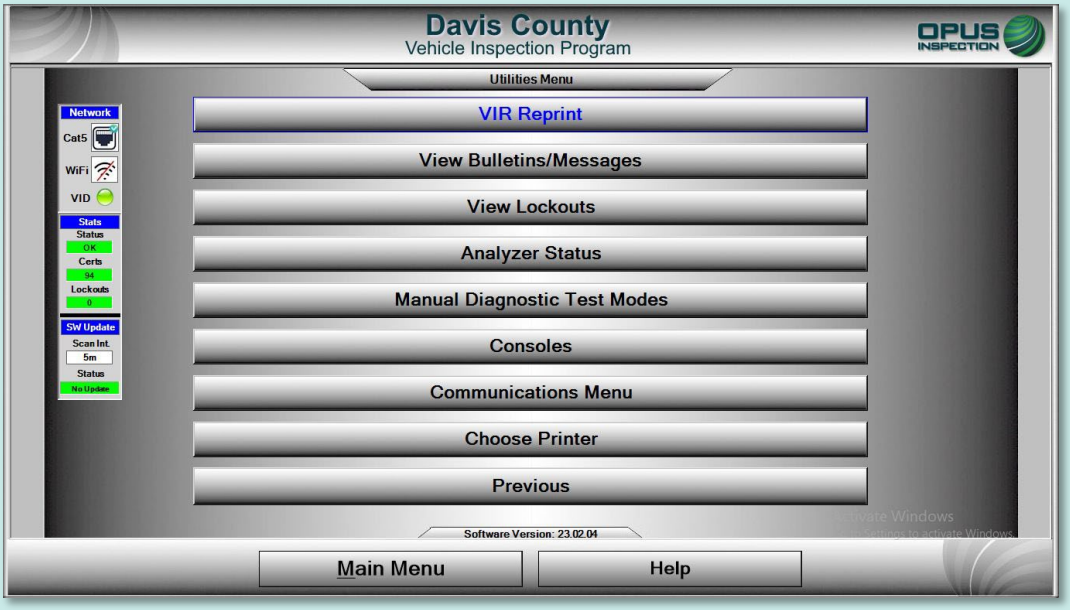
6.Utilities menu

The **Utilities Menu** (Figure 72) includes a variety of useful functions, such as:

- VIR reprint
- View bulletins and messages
- View lockouts
- Analyzer status
- Manual (diagnostic) test mode (OBD)
- Consoles
- Communications menu
- Choose printer
- Previous

Each utility is described in a subsection below.

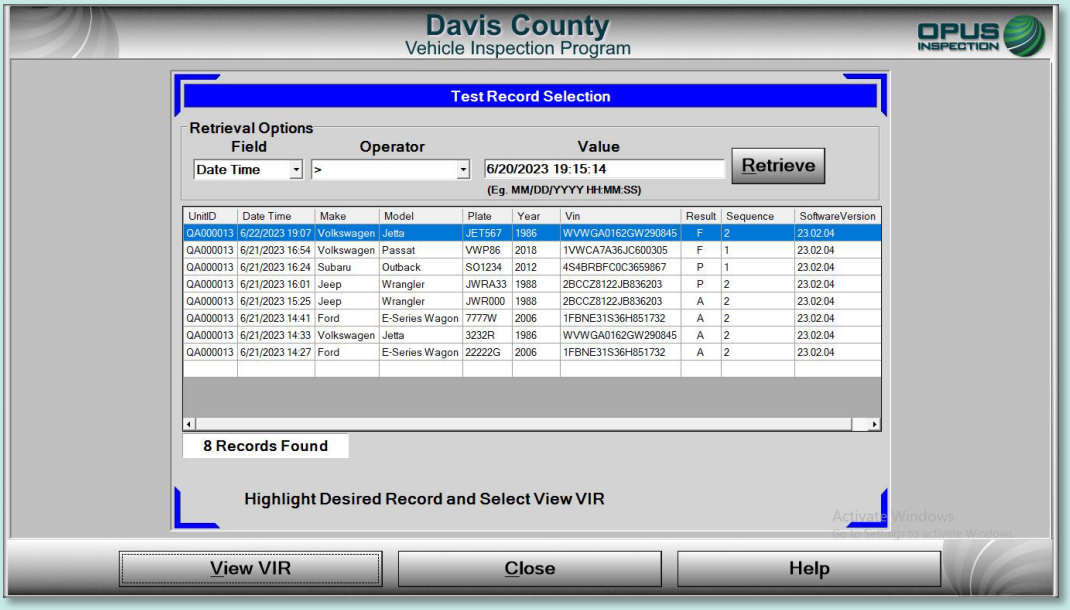
Figure 72: Utilities menu



6.1 VIR reprint

From the **Utilities Menu**, click **VIR Reprint** to bring up a list of test records (Figure 73), searchable by date/time and operator, from which a VIR can be viewed and printed.

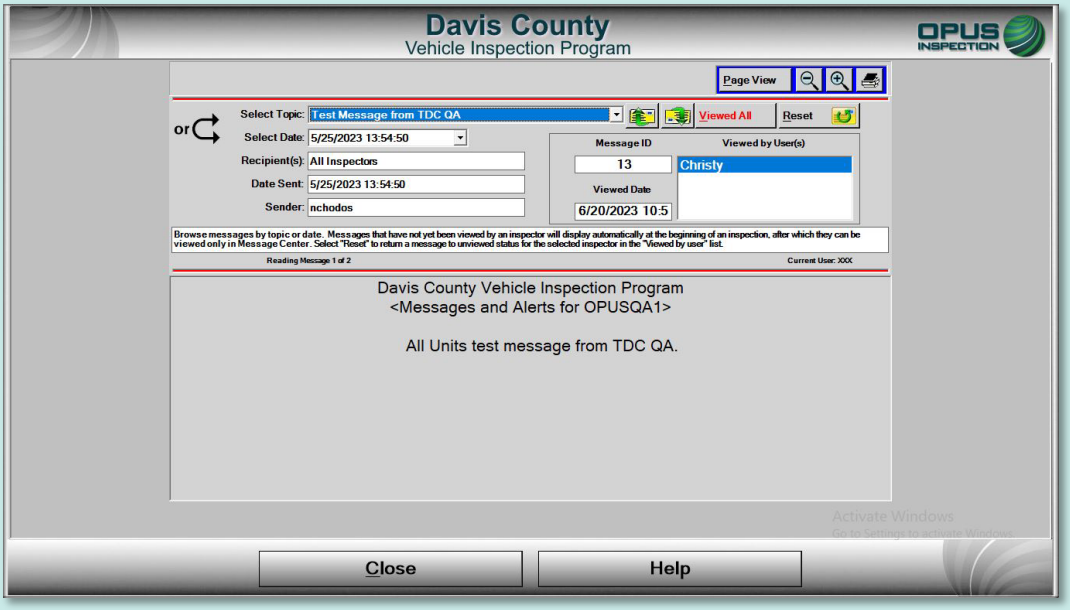
Figure 73: Utilities—VIR reprint



6.2 Viewing bulletins and messages

Click **View Bulletins/Messages** to bring up a screen (Figure 74) providing searchable parameters and several message-handling functions.

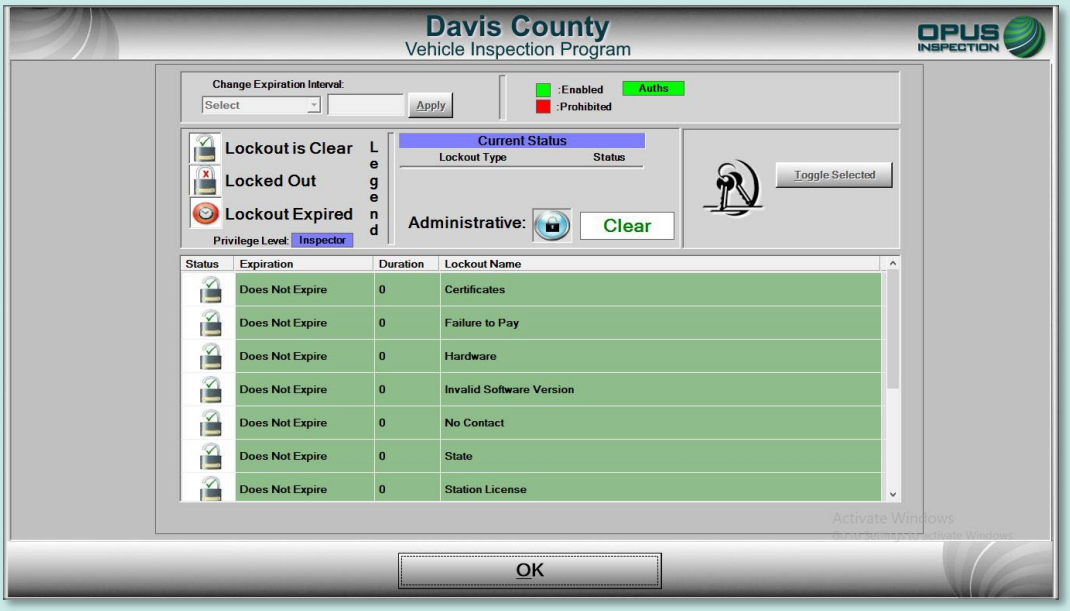
Figure 74: Utilities—View bulletins and messages



6.3 Viewing lockouts

Lockouts impact your ability to perform inspections. Most lockouts are due to lack of certificates or a result of administrative actions. Click **View Lockouts** to display a screen (Figure 75) of lockouts and their current status. You can scroll down to see additional lockouts.

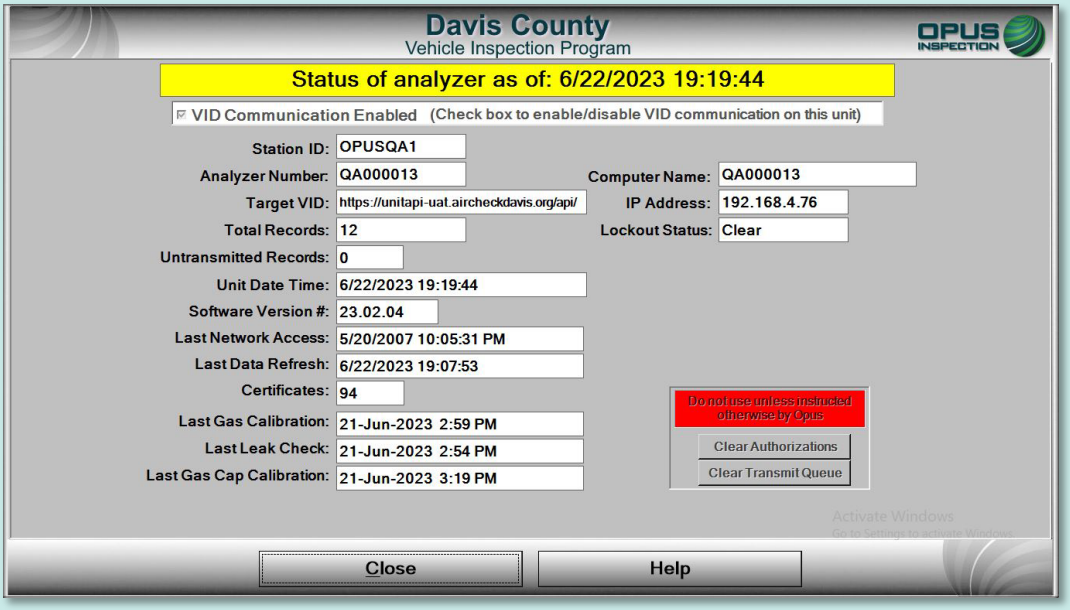
Figure 75: Utilities—View lockouts



6.4 Analyzer status

The Analyzer status screen (Figure 76) provides a quick snapshot of relevant analyzer functions useful for troubleshooting, viewing calibration status, data communications, and more.

Figure 76: Utilities—Analyzer status



6.5 Manual diagnostic test modes

Clicking the **Manual Diagnostics Test Mode** option enables the user to run OBD or gas test modes that are not part of an official or training/demo inspection. No records are retained; this function is for diagnostic purposes only.

Figure 77 displays a menu of test modes. You will be prompted for additional vehicle details in subsequent screens (see Figure 78 for OBD, Figure 79 for Gas). At any time, click **Help** to access operator documentation.

Figure 77: Utilities—Diagnostic test mode

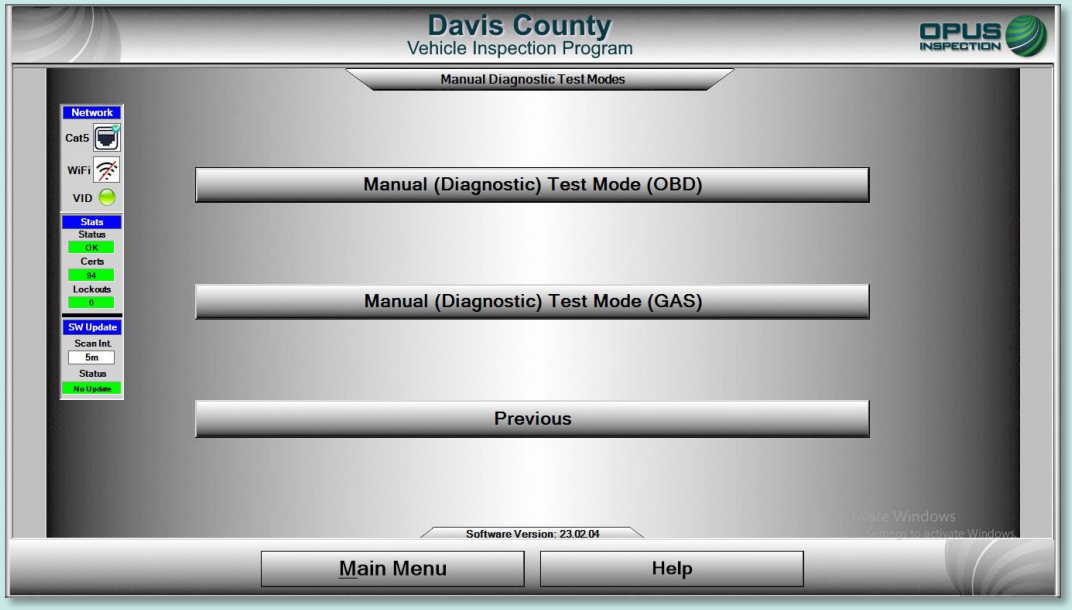


Figure 78: Utilities—OBD manual diagnostic test mode

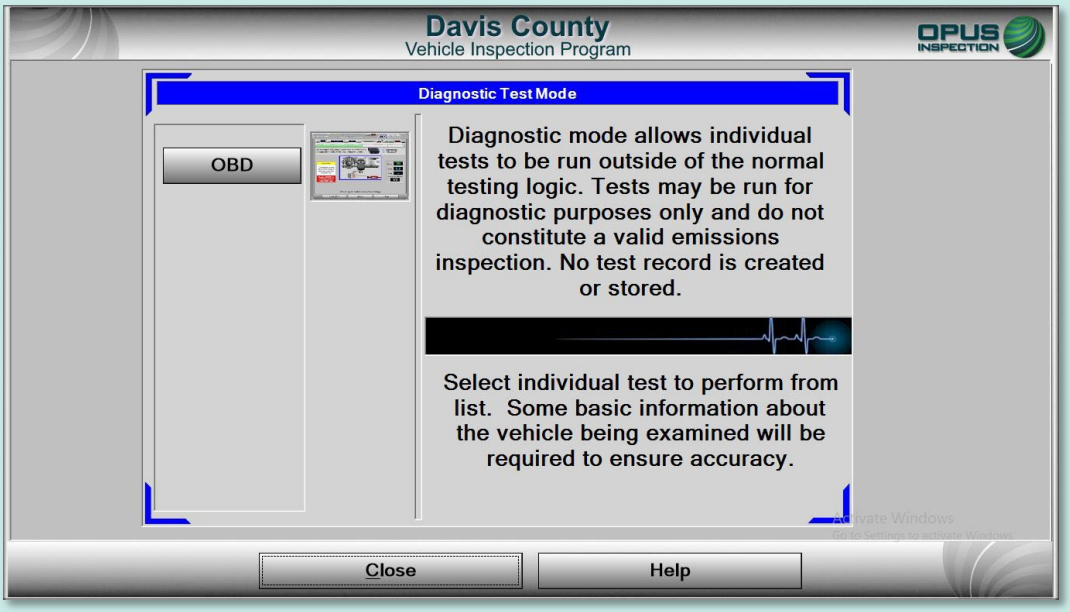
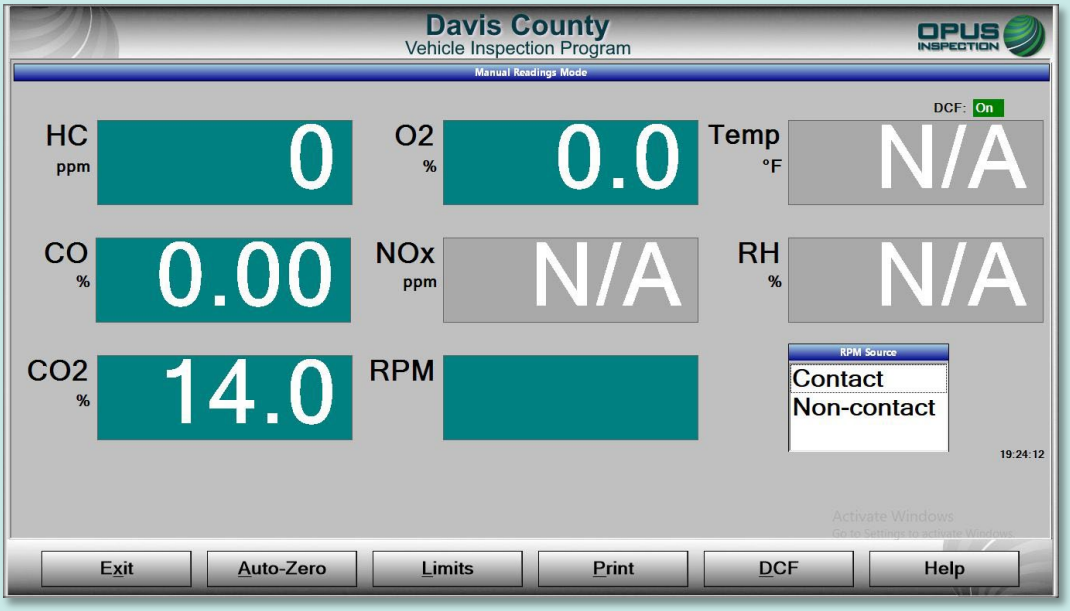


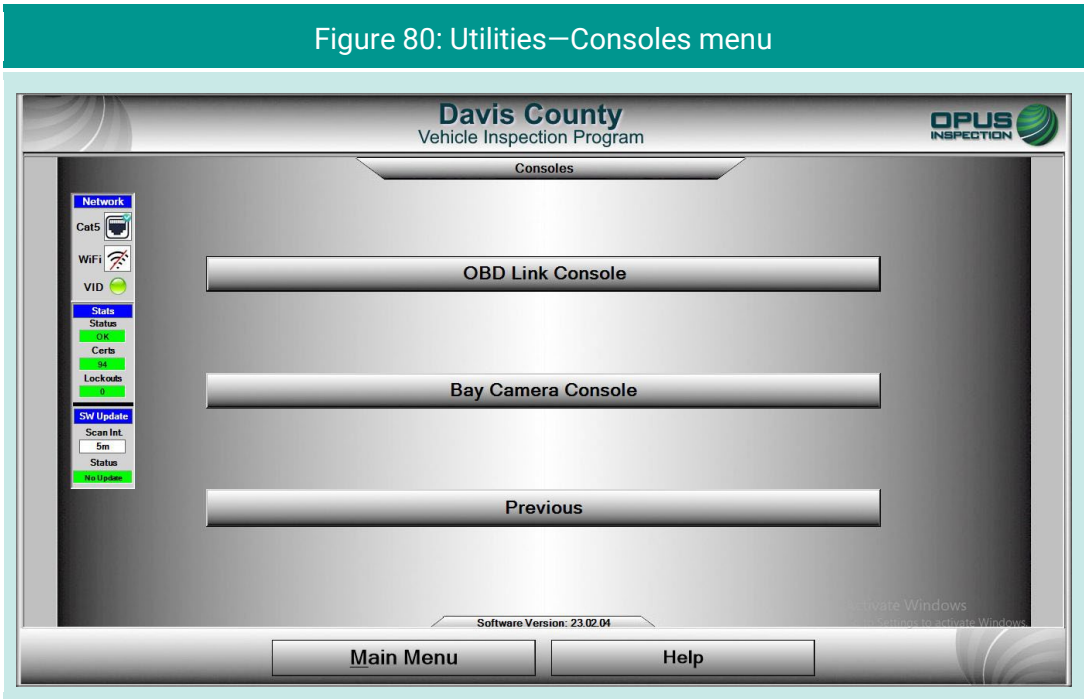
Figure 79: Utilities—Gas manual diagnostic test mode



6.6 Consoles

The **Consoles** menu (Figure 80) provides access to the **OBD link Console** and the **Bay Camera Console** cameras for diagnostic purposes.

Figure 80: Utilities—Consoles menu

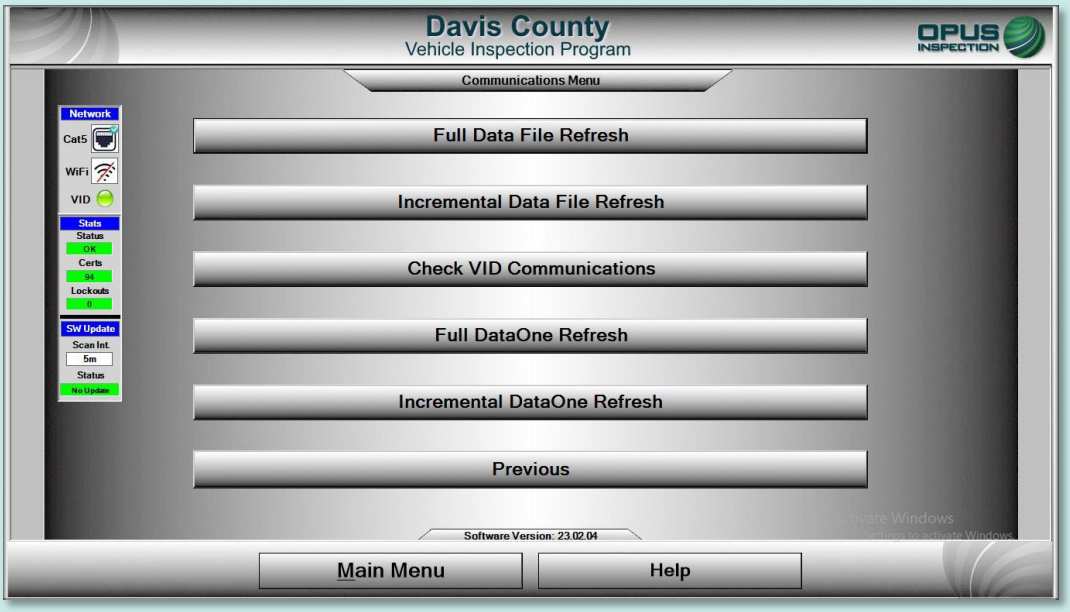


6.7 Communications menu

The **Communications Menu** (Figure 81) offers several simple functions primarily used with inspection system troubleshooting, including

- Full data file refresh
- Incremental data file refresh
- Check VID communications
- Full DataOne refresh
- Incremental DataOne refresh
- Previous

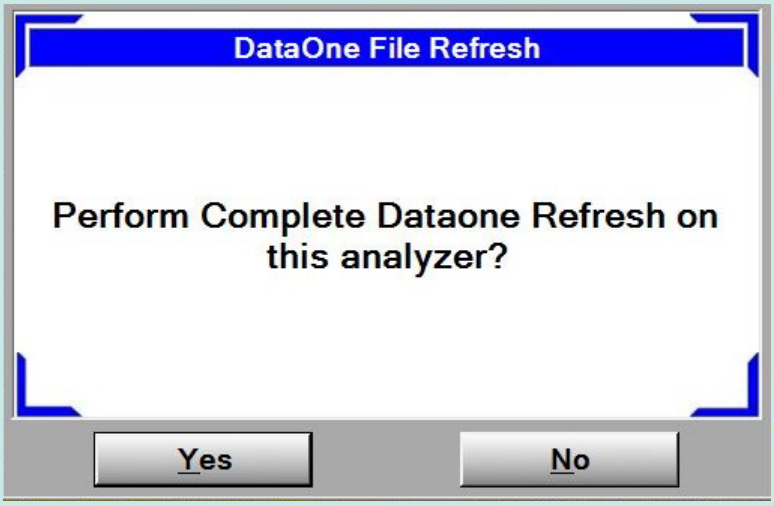
Figure 81: Communications menu



6.7.1 Data file and DataOne file refresh functions

Data files (inspection and vehicle data) and DataOne (vehicle data lookup) files can be refreshed by selecting either **Full** or **Incremental** refresh options from the Communications Menu. A screen indicating that the inspection system is connecting with the VID will appear. With the DataOne refresh, a pop-up prompt requesting confirmation will appear (Figure 82); click **YES** to proceed or **NO** to abort the action.

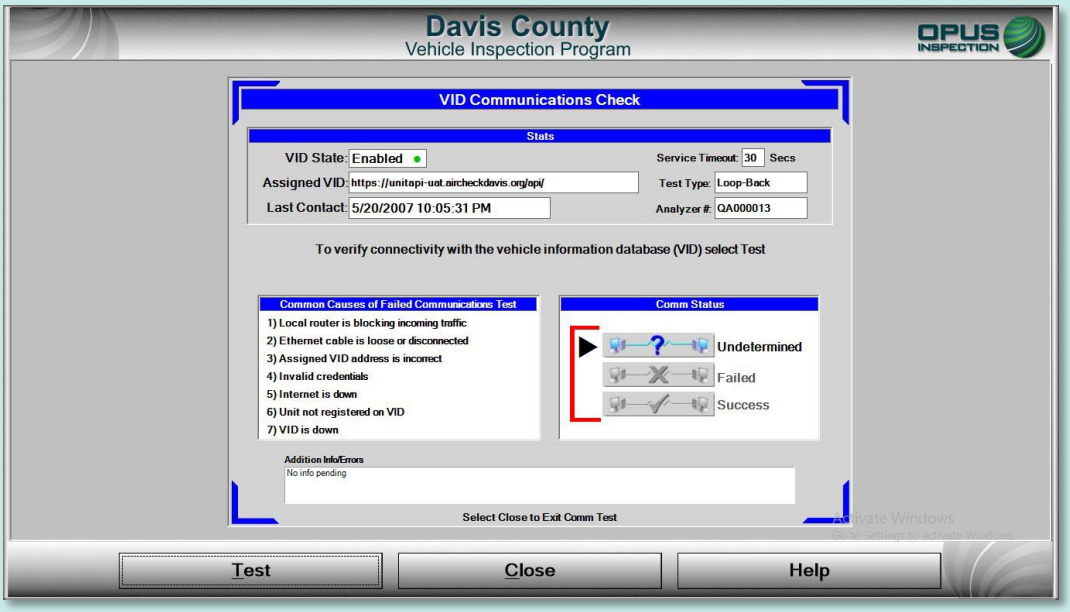
Figure 82: Performing complete DataOne refresh—confirmation prompt



6.7.2 VID communications check

Selecting **Check VID Communications** from the **Communications Menu** will display a screen (Figure 83) that produces relevant stats when the **Test** button is selected. The results screen includes a list of common failure causes and the current comm status.

Figure 83: VID communications check in-progress



6.8 Choose printer

Selecting **Choose Printer** from the **Utilities Menu** will allow you to choose from available printers detected by the inspection system.

6.9 Previous

Selecting **Previous** from the **Utilities Menu** will return you to the **Main Menu**.

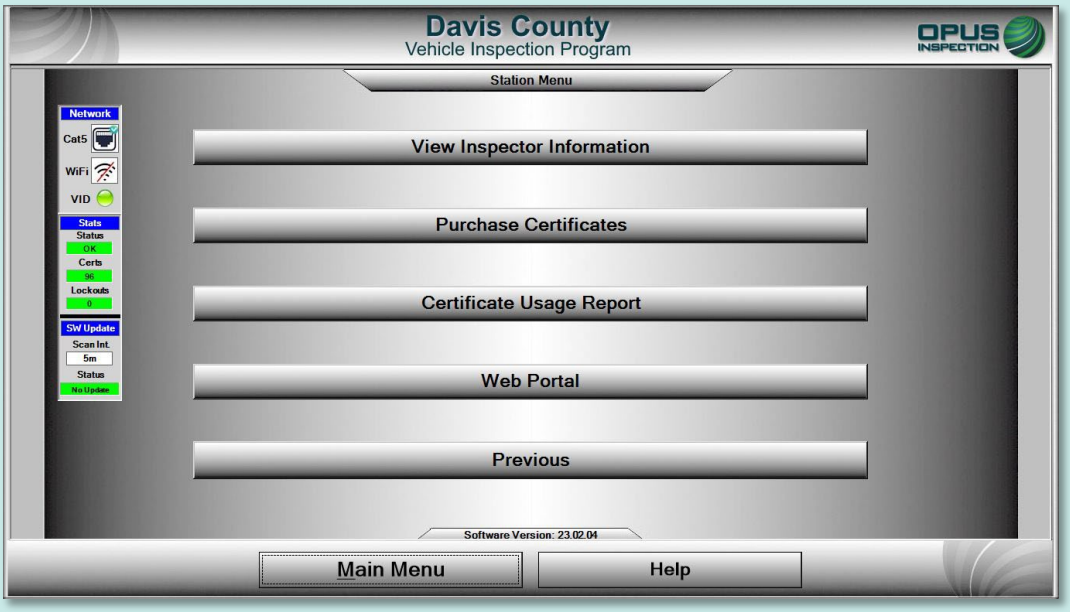
7.Station menu

The Station Menu (Figure 84) provides several important and useful functions available to authorized users, including:

- View inspector information
- Purchase certificates
- Certificate usage report
- Resend records to VID
- Web portal
- Previous

These functions are described in the subsections below:

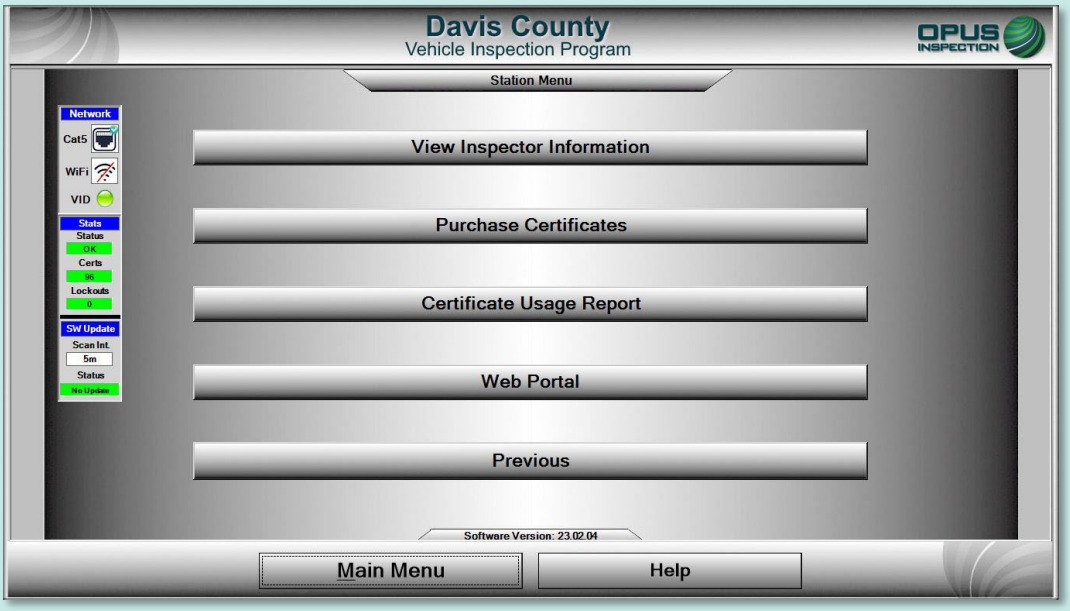
Figure 84: Station menu



7.1 View inspector information

Selecting View Inspector Information displays a screen listing all inspectors authorized to perform inspections on the inspection system (Figure 85). Information listed includes expiration date and access level.

Figure 85: View inspector information



7.2 Purchase certificates

Selecting Purchase Certificates from the Station Menu will take you to the login screen on program website. Enter the username and password and follow instructions on the website.

7.3 Certificate usage report

Selecting the Certificate Usage Report from the Station Menu will display a screen with a table of certificates used by day and inspector.

7.4 Web portal

Selecting Web Portal from the Station Menu will bring up the Davis County program website.

7.5 Previous

Selecting Previous from the Station Menu will return you to the Main Menu.

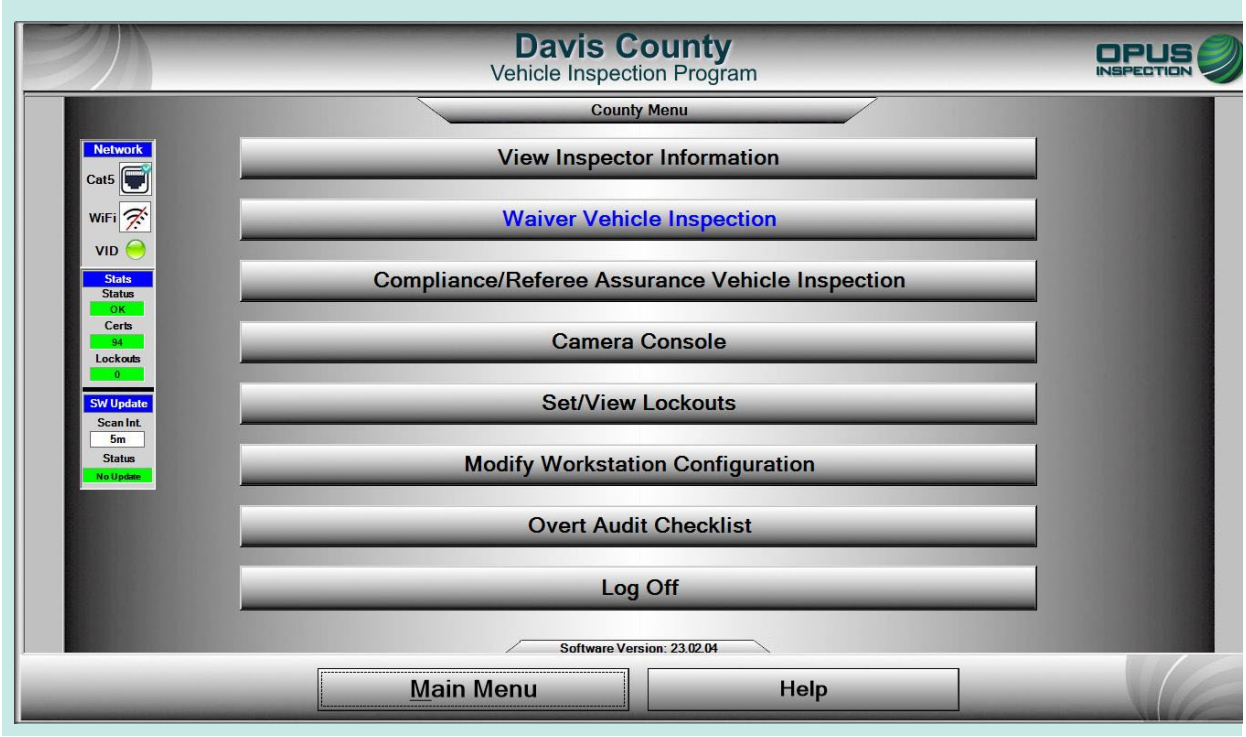
8.County menu

The County menu (Figure 86) includes the following options:

- View inspector information
- Waiver vehicle inspection
- Compliance/referee assurance vehicle inspection
- Camera console
- Set/view lockouts
- Modify workstation configuration
- Overt Audit Checklist

Each menu option is described briefly below.

Figure 86: County menu



8.1 View inspector information

This option enables the County user to view a table of inspectors authorized to perform inspections using the analyzer.

8.2 Waiver vehicle inspection

Selecting this option enables the authorized user to perform a waiver vehicle inspection. The waiver inspection emulates the standard vehicle inspection process with the addition of certain overrides.

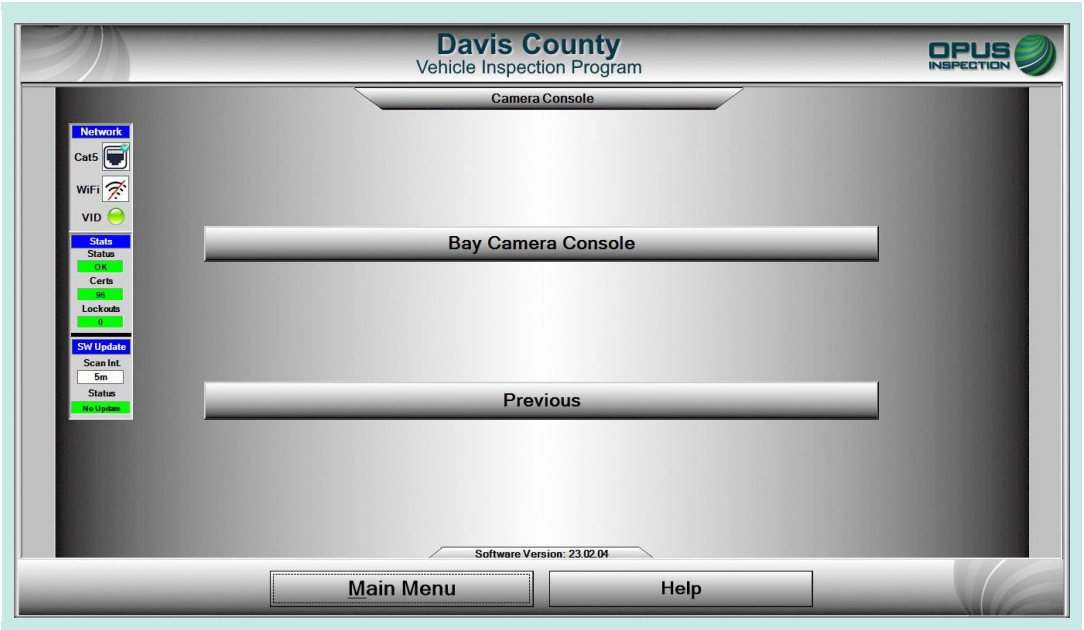
8.3 Compliance/referee assurance vehicle inspection

As with the waiver vehicle inspection, selecting this option enables the authorized compliance officer/referee to perform a vehicle inspection that emulates the standard vehicle inspection process with the addition of certain overrides.

8.4 Camera console

The Camera console menu (Figure 87) provides access to the **Bay Camera Console**.

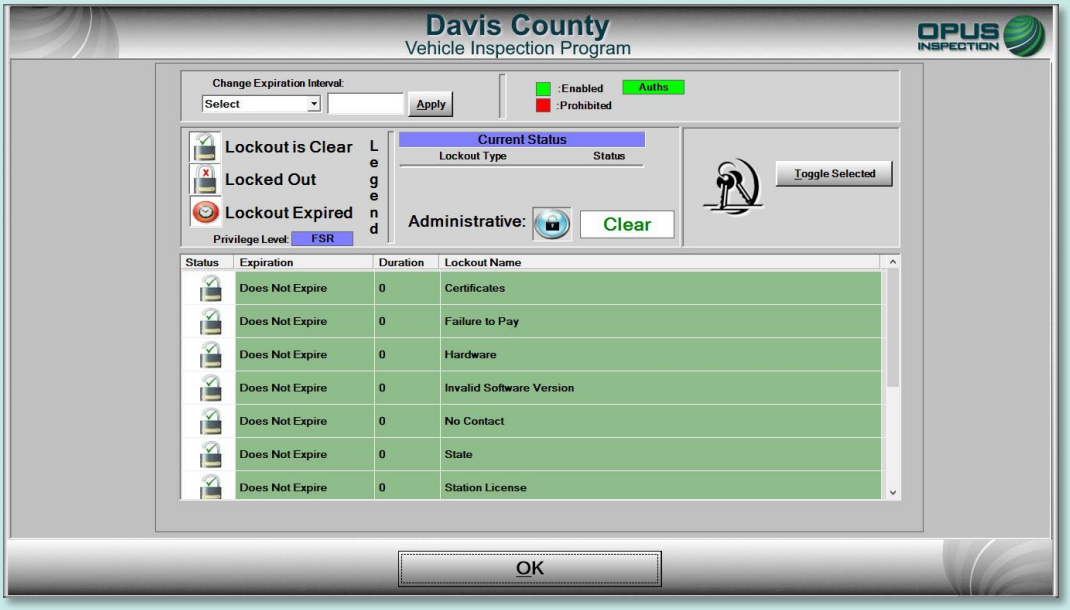
Figure 87: County—Camera console menu



8.5 Set/view lockouts

The Set/view lockouts option (Figure 88) provides the user with ability to view and manage the analyzer's lockouts.

Figure 88: County—Set/view lockouts



8.6 Modify workstation configuration

Selecting the modify workstation configuration option brings you to a menu (Figure 89) that provides the utilities listed below. Most of these options are self-explanatory.

- Update workstation information (seen in Figure 90)
- Software update
- Reset workstation date and time
- Choose printer
- Previous

Figure 89: County—Modify workstation configuration menu

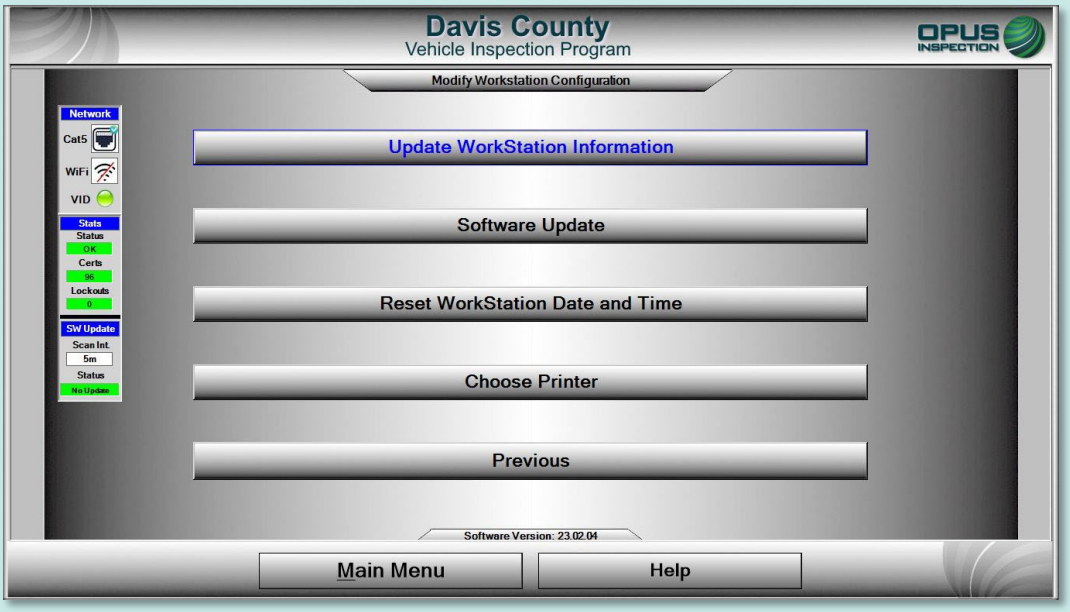
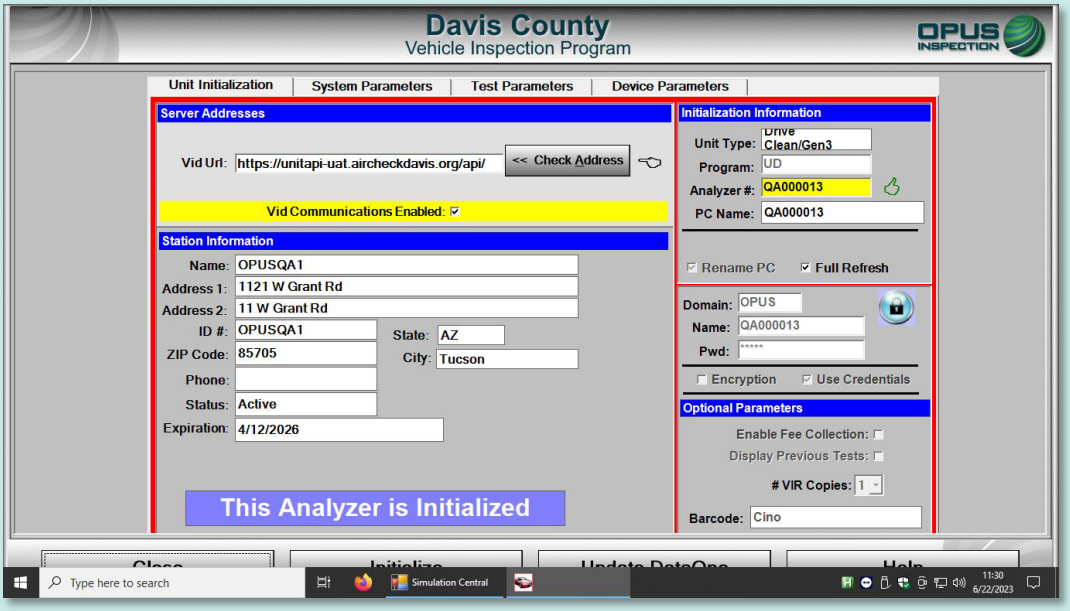


Figure 90: County—Update workstation information



8.7 Overt Audit Checklist

This County menu option sends the authorized user to a screen for logging on to the Opus VID Central database management console.

9.Service tech menu

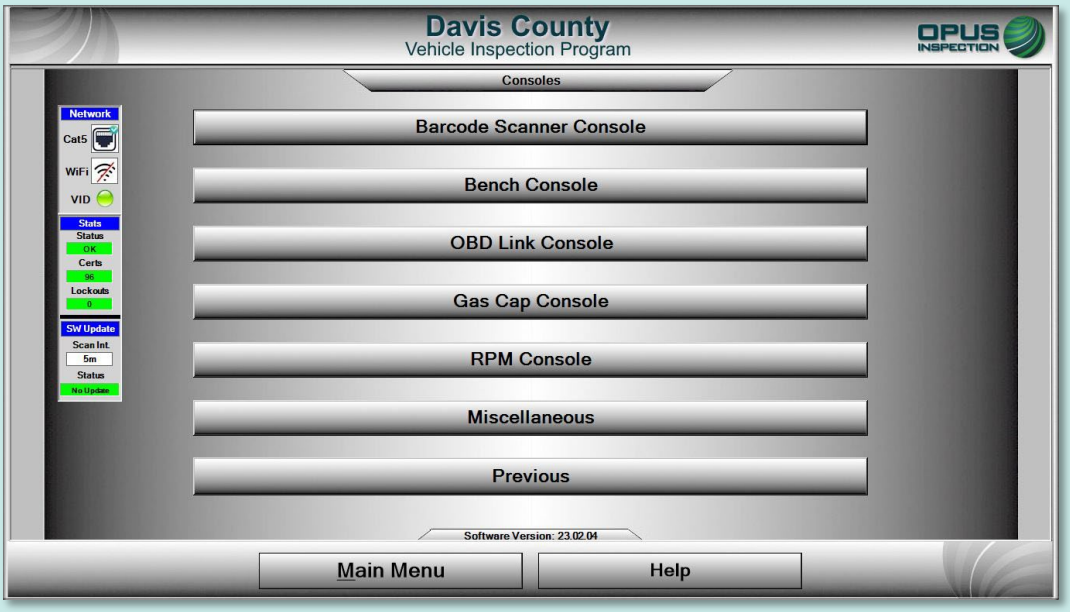
The service tech menu (Figure 91) provides the authorized Opus field service technician with the following options:

- Consoles (see Figure 92)
- OBD-II Self-check
- Analyzer status
- Communications menu
- Set/view lockouts
- Modify workstation configuration
- Log off

Most of these functions are also found under the Utilities menu and are described in in Section 6 of this manual.

Figure 91: Service Tech Menu

Figure 92: Service Tech—Consoles menu

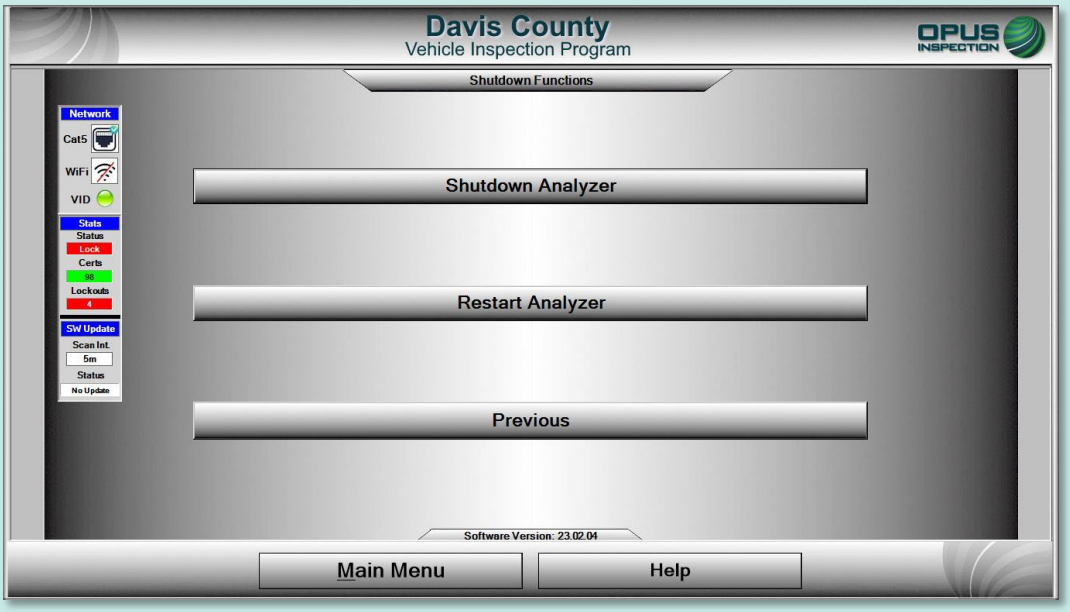


10. System shut down

The **Shutdown Functions** menu (Figure 93) provides three self-explanatory functions:

- **Shut down analyzer** (inspection system), which performs a system shut down and turns off the Gen 3 System.
- **Restart analyzer** (inspection system), which initiates a reboot of the Gen 3 System; and
- **Previous**, which returns the user to the **Main Menu** without initiating shut down functions.

Figure 93: Shut down functions menu



11. Maintenance

The Davis County Gen3 TSI/OBD-II system is designed to require little maintenance other than calibrations and periodic cleaning. Cables should be inspected on a periodic basis and worn components should be replaced.

To clean the LCD display screen and camera lenses, use a soft, lint-free cloth. Paper-based wipes and paper towels must be avoided as they can leave scratches on the screen and lenses. A microfiber cloth is best for cleaning.

Avoid using solvents or cleansers on any Gen3 System surface. A solution of 70% isopropyl alcohol with distilled water is recommended.

12. Opus contact information

If you have questions that are service related, please contact Opus Inspection at the following toll-free telephone number for assistance: 1 (800) 695-4377.