SMOG CHECK MANUAL

April 2025

DEPARTMENT OF CONSUMER AFFAIRS

BAR

Bureau of Automotive Repair

PREFACE

This manual is incorporated by reference in Section 3340.45, Title 16, of the California Code of Regulations. It provides procedures for performing official Smog Check inspections. Licensed Smog Check stations and inspectors must follow these procedures, and the BAR-97 Emission Inspection System, OBD Inspection System (OIS), and Low Pressure Fuel Evaporative Test (LPFET) equipment prompts when conducting Smog Check inspections.

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Suggestions for improvement to this manual are welcomed. They should be directed to the Bureau of Automotive Repair, Smog Check Manual Author via email to bar.industryhelpdesk@dca.ca.gov.

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Table of Contents

Pre-Inspection/Pre-Repair Check List 3
Test Requirements 4
1.1.0 Inspector Access 5
1.1.1 Vehicle Identification Information 5
1.2.0 Before Test Conditions 7
1.2.1 Acceleration Simulation Mode (ASM) Emission Inspection 8
1.2.2 Two Speed Idle Inspection (TSI) 9
1.2.3 Emission Test Abort Conditions (ASM/TSI) 9
1.2.4 Exhaust Dilution/Sample Dilution 10
Visual Inspection 11
1.3.0 Visual Inspection 11
1.3.1 Visual Inspection Procedures 11
1.3.2 Emission Control System Labels 14
1.3.3 Liquid Fuel Leak Inspection (Gasoline Only) 14
1.3.4 Visible Smoke Test 15
1.3.5 Visual Inspection Result Definitions 16
Emission Control Functional Tests 17
1.4.0 Functional Test Application 17
1.4.1 Malfunction Indicator Light (OBD I and OBD II) 17
1.4.2 OBD II Functional Test 17
1.4.3 Ignition Timing Test 18
1.4.4 EGR System Functional Test 18
1.4.5 Fuel Cap Integrity Test 18
1.4.6 Low Pressure Fuel Evaporative Test 19
Smog Check Inspection Results 21
1.5.0 Vehicle Inspection Report 21
1.5.1 Vehicle Passes Smog Check 21
1.5.2 Vehicle Fails Smog Check 21
Repair Data 22
1.6.0 Repair Information Entry 22
Miscellaneous 23
1.7.0 Test Restrictions for Directed Vehicles 23
1.7.1 Gross Vehicle Weight Rating (GVWR) for Trucks and Motor Homes 23
1.7.2 Pre-Inspection Mode 23
1.7.3 Pre-Inspection Repair 24
1.7.4 Virtual Hands-On Inspection 24

Equipment and Reference Material Requirements 25
1.8.0 Equipment and Reference Materials 25
1.8.1 Required Equipment Maintenance 28
1.8.2 Required Equipment Electronic Transmission 28
1.8.3 Required Equipment Location 28
APPENDIX A 29
Visible Smoke Test Procedures for GASOLINE powered vehicles: 30
APPENDIX B 33
Visible Smoke Test Procedures for DIESEL powered vehicles: 34
APPENDIX C 37
Aftermarket Parts Verification Requirements 38
Emission Systems Inspection Details 40
ARB Definitions of Aftermarket Parts 41

Pre-Inspection/Pre-Repair Check List

- ☐ Check for vehicle test restrictions. If test restrictions apply, inform the customer of those restrictions. For more information, see section 1.7.0.

    - If a station lacks the equipment, tools, or reference materials necessary to inspect or repair a particular vehicle, the station must reject the vehicle before starting an inspection or repair.

    - If, as a matter of policy, a test-and-repair station that does not repair certain types of vehicles or inspection failures, must reject the vehicle before starting an inspection or inform customer orally and in writing.

- ☐ Ensure the customer is provided an estimate in accordance with the Automotive Repair Act, Business and Professions Code section 9884.9, Health and Safety Code section 44033, and Title 16, California Code of Regulations section 3353. Be sure to determine the required test type prior to preparing the written estimate and obtaining customer authorization.

- ☐ Check that all required equipment is up-to-date, maintained and calibrated in accordance with the manufacturer standards and applicable BAR specifications.

- ☐ Ensure the vehicle is safe to test.

Test Requirements

Required Tests Tailpipe Inspections: (see section 1.2 for specifics)	BAR-97 Gasoline 1976-1995[1]	BAR-97 Gasoline 1996-1999[1]	OIS Hybrid 2000 and newer[2]	OIS Diesel 1998 and newer[3]	OIS Gasoline 2000 and newer[1,4]
Acceleration Simulation Mode (ASM) or Two Speed Idle (TSI)[5]	√	√			

Required Tests Visual Inspection: (see section 1.3 for specifics)	BAR-97 Gasoline 1976-1995[1]	BAR-97 Gasoline 1996-1999[1]	OIS Hybrid 2000 and newer[2]	OIS Diesel 1998 and newer[3]	OIS Gasoline 2000 and newer[1,4]
Crankcase Emission Controls	√	√	√	√	√
Thermostatic Air Cleaner	√	√			
Fuel Evaporative System (EVAP)	√	√	√		√
Exhaust Gas After Treatment Systems	√	√	√	√	√
Exhaust Gas Recirculation (EGR)	√	√	√	√	√
Ignition Spark Controls	√	√	√		√
Fuel Metering Systems	√	√	√	√	√
Air Injection System	√	√	√		√
Computers, Sensors, and Switches	√	√	√	√	√
Other Emission Related Components	√	√	√	√	√
Liquid Fuel Leak (section 1.3.3)	√	√	√		√
Visible Smoke Test (section 1.3.4)	√	√		√	√

Required Tests Functional Inspections: (see section 1.4 for specifics)	BAR-97 Gasoline 1976-1995[1]	BAR-97 Gasoline 1996-1999[1]	OIS Hybrid 2000 and newer[2]	OIS Diesel 1998 and newer[3]	OIS Gasoline 2000 and newer[1,4]
On-Board Diagnostics (OBD)		√	√	√	√
Malfunction Indicator Light (MIL)	√	√	√	√	√
Exhaust Gas Recirculation (EGR)[6]	√				
Ignition Timing	√				
Fuel Cap Integrity	√				
Low Pressure Fuel Evaporative Test (LPFET)	√				

[1] Gasoline includes alternative fueled vehicles, e.g., ethanol, methanol, liquefied petroleum gas (LPG), compressed natural gas (CNG), etc. Dedicated propane and natural gas vehicles over 14,000 lbs. Gross Vehicle Weight Rating (GVWR) do not require a Smog Check inspection.
[2] Hybrid vehicles are powered by both internal combustion and electric power sources.
[3] Diesel-powered vehicles with a GVWR greater than 14,000 lbs. are exempt from the Smog Check Program.
[4] Exception: Some model-year 2000 and newer gasoline category vehicles will require a tailpipe test on the BAR-97 EIS. These include vehicles without OBDII systems, vehicles over 14,000 lbs. GVWR, and vehicles identified by BAR with problematic OBDII systems.
[5] ASM required for vehicles registered in Enhanced program areas, unless vehicle is incompatible with dynamometer test, then TSI shall be performed. TSI required in Basic and Change of Ownership Program areas.
[6] The EGR functional inspection is only performed in conjunction with a TSI tailpipe test.

Vehicle Identification

1.1.0 Inspector Access

Entering an Inspector's license number and use of a biometric device, as specified in the Required Equipment/Materials table in Section 1.8.0, provides access into the BAR-97 Emissions Inspection System (EIS) or OBD Inspection System (OIS) Smog Check inspection menu, as applicable. Follow the EIS or OIS prompts to access the Smog Check inspection mode.

BAR or a BAR authorized representative shall use a biometric device to collect inspector biometric data and for purposes of authorizing access to perform inspections using the EIS or OIS, shall verify the identity using two forms of identification. One must be a valid, government-issued photo identification, other than a BAR issued license badge (e.g., driver license, passport, or military identification). The second identification must have the enrollee's signature and legal name (e.g., social security card or credit card).

An access code is assigned by BAR and is unique to each licensed inspector. If, at the time of enrollment, the biometric system is unable to collect sufficient data necessary to create a uniquely identifiable profile from both hands, BAR shall allow access to the BAR-97 EIS or BAR-OIS using a BAR assigned access code. In such cases, each inspector must maintain the security of his or her access code. Disclosure of one's access code or use of another inspector's access code or license information is prohibited and such conduct will result in disciplinary action. If the security of your access code has been compromised, or you suspect another person is using your access code, you must contact your local BAR field office immediately.

1.1.1 Vehicle Identification Information

Inspectors must follow the EIS or OIS prompts to input the vehicle identification number (VIN), license plate number, and odometer reading. Typically, the remaining vehicle information populates via the Vehicle Information Database (VID) and/or the EIS Vehicle Look-Up Table. The chart on the next page provides details for entering vehicle information.

No person shall enter any vehicle identification information for any vehicle other than the one being tested. Nor shall any person knowingly enter any false information about the vehicle being tested.

- The bar code scanner must be used as the first method of entry. Manual entry must only be used in cases where the vehicle is not equipped with a bar code or the bar code is illegible, and the registration documents are unavailable or do not include a bar code. In these cases, you may proceed with the inspection and manually enter the vehicle identification information, as needed.

- When using the vehicle registration documents to scan vehicle information, you must first verify the VIN shown on the registration document matches the VIN on the vehicle. If the VIN does **not** match, the inspector shall use the VIN affixed to the vehicle and inform the customer of the mismatch and that it may cause the Department of Motor Vehicles (DMV) not to accept the test results.

- If VID communication failure occurs on the EIS, the inspector must enter all applicable information. However, for a California registered vehicle, inspectors must first verify that the VIN and license plate entries are correct, and check that the EIS is properly connected to the VID. If VIN and plate entries are correct, and communication failure continues, complete the inspection as prompted by the EIS. In these cases, DMV may request a copy of the VIR as proof of certification. Advise the motorist to retain a copy of the VIR throughout the registration process.

- The EIS and OIS will not function without a continuous Internet connection to the VID. Anytime the OIS fails to communicate with the VID, the problem must be fixed before performing an inspection.

- When inspecting a government fleet vehicle, enter the “Government Fleet BAR file number.” Get this number from the government fleet.

Accuracy is critical to ensure the appropriate test sequences and standards are applied. For all inspections, inspectors must verify that all vehicle information is complete and correct. If not, inspectors must make the necessary corrections.

Each inspector is responsible for the accuracy of the test. Once a certificate is issued it is impossible to void that certificate.

BAR-97/OIS Entries
Vehicle Identification Number
License Plate Number (If no plate, enter “NONE”)[7]
Current Odometer Reading[8]
Exhaust Configuration, when prompted (Single or Dual) - *BAR-97 only*
Model-Year
Vehicle Type Code (PC, TRK, MH, GOV, PFR) - *BAR-97 only*
Government Fleet BAR File number
Gross Vehicle Weight Rating (See section 1.7.1 for more information)
Vehicle Make
Body Type - *BAR-97 only*
Vehicle Model Name
Number of Cylinders - *BAR-97 only*
Engine Size - *BAR-97 only*
Transmission Type - *BAR-97 only*
Certification Type; (CA, FED, Referee)
BAR Referee Label Number[9]
Fuel Type[10]
Engine Make (Motor Homes, Referee) - *BAR-97 only*
Engine Year (Motor Homes, Referee) - *BAR-97 only*

Note: Inspectors must verify all applicable entries are complete and accurate and, if not, make the necessary corrections. If an error is found after changes no longer can be made, abort the inspection and start over using the correct information.

[7] For government vehicles do not enter “E” preceding the plate number; enter the last 7 digits.
[8] Enter the odometer reading as displayed. Do not attempt to estimate vehicle mileage or convert from kilometers to miles. If the odometer is missing or illegible, enter “None.”
[9] For the purposes of a Smog Check inspection, the BAR Referee Label provides the certification type and emission control requirements for kit cars – Specially Constructed (SPCNS) vehicles, grey market vehicles, and vehicles with engine changes. When inspecting a vehicle equipped with a Referee label, enter “R” for vehicle certification type. Do not inspect SPCNS, grey market vehicles or vehicles with an engine change unless equipped with a BAR Referee Label.
[10] Inspect a dual/bi-fuel vehicle using the fuel in which the vehicle was operating on when it arrived at the station.

1.2.0 Before Test Conditions

Before the tailpipe emissions inspection an inspector must:

- Check that there are no obvious safety hazards. Inspectors may reject a vehicle from testing that is unsafe to test. For more information, see section 1.2.3.

- Verify the vehicle is warmed up to normal operating temperature. If the vehicle is not at normal operating temperature, the vehicle may either be idled (low idle) or driven normally as necessary to achieve normal operating temperature. Normal operating temperature may be confirmed in one of the following ways:

    - The coolant temperature gauge shows normal operating temperature;

    - The upper and lower radiator hoses are hot and appropriately pressurized; and/or

    - When applicable, the electric cooling fan cycles on at idle.

Once at normal operating temperature, continuously operate the engine at low idle for at least 3 minutes immediately prior to the tailpipe emissions inspection.

Inspectors shall not attempt to superheat the catalyst. Do not increase the engine RPM or load during the 3-minute idle period or during the tailpipe emissions inspection sequences except as necessary to perform the initial visible smoke snap test as described in Appendix A. Any methods used to artificially increase catalyst temperature are prohibited.

- Turn off all vehicle accessories.

- (TSI only) Place the transmission in neutral or park, with the parking brake on and/or wheel chocks in place.

- (ASM only) Verify the vehicle can be tested on a dynamometer. See section 1.2.1 for incompatible examples.

- (ASM only) Verify that the tires are dry, inflated to proper pressure, and in a safe condition. If necessary, complete the tire drying sequence as prompted by the EIS.

- (ASM only) Disable traction control, when applicable.

- (ASM only) To prevent damage, verify that the vehicle safely fits on the dynamometer, and is compatible for operation on a 2WD dynamometer. Place the vehicle's drive wheels on the dynamometer. Vehicles that do not fit into your building or testing area must be returned to the customer for inspection at another station.

- (ASM only) Verify that the vehicle is restrained in accordance with the EIS manufacturer standards, and wheel chocks are in place.

- (ASM only) Verify that the vehicle cooling fan is positioned correctly. The fan must be used when the ambient temperature reaches 72º or above.

- As prompted by the EIS, connect or place the RPM pick-up device.

- As prompted by the EIS, insert the sample probe in the tailpipe.

- (ASM only) Lower the vehicle hood during the emissions test.

1.2.1 Acceleration Simulation Mode (ASM) Emission Inspection

Vehicle model-years 1976 - 1999 that are registered in the Enhanced Program area require an ASM inspection~~,~~ excluding motorhomes and heavy-duty vehicles meeting certain conditions. See examples below.

The ASM emission inspection includes two loaded mode sequences known as the 50/15 test and the 25/25 test.

Inspectors must ensure that all the applicable before-test-conditions specified in section 1.2.0 are met before beginning the ASM inspection. **Once the applicable before-test-conditions are met, follow the EIS prompts to conduct the ASM inspection.**

> **CAUTION!** Be aware that some vehicle designs are incompatible with a two wheel drive (2WD) dynamometer. Any attempt to operate such vehicles on a 2WD dynamometer could cause injury and/or may damage the vehicle. If the vehicle is not compatible with the ASM inspection, then a TSI inspection shall be performed.
>
> The following are examples of vehicle designs that are not compatible with the ASM test and therefore must receive the two-speed-idle test:
>
> - Full-time all wheel or four wheel drive;
> - Traction control that cannot be disabled;
> - Body or chassis modifications made for business purposes that make the vehicle incompatible with loaded mode testing;
> - Unable to safely fit on the dynamometer;
> - Motorhomes as classified by the Department of Motor Vehicles over 8,500 GVWR;
> - Heavy duty vehicles with GVWR between 8,501 and 9,999 and with an unloaded drive axle weight over 5,000 pounds.
> - Heavy duty vehicles with GVWR over 9,999.

Notes: For the purposes of a Smog Check inspection, the term “unloaded” shall mean that the vehicle is not currently transporting loads for delivery or is not carrying items of a temporary nature (bricks, sand, lumber, etc.). The GVWR includes items that have been welded, bolted or otherwise permanently affixed to the vehicle, and tools, supplies, parts, hardware, equipment or devices of a similar nature that are routinely carried in or on the vehicle in the performance of the work for which the vehicle is primarily used. **To ensure the appropriate test and emission standards are applied, always follow the EIS prompts.**

ASM Gear Selection:

- **Automatic transmission** – Conduct the ASM test in the gear selector's normal/default driving position. Do not use any alternative driving modes, e.g., "towing mode", "low traction", "performance", or "sport."

- **Manual transmission** – Conduct the ASM test for both modes of the test in second gear. Only select higher or lower gears to maintain the EIS specified RPM range.

1.2.2 Two Speed Idle Inspection (TSI)

The TSI inspection is only required in Basic and Change of Ownership Smog Check Program Areas and in Enhanced Smog Check Program Areas for vehicles that are incompatible with the ASM inspection.

The TSI inspection includes two test sequences; a 2500 RPM test and an idle test.

Inspectors must ensure that the applicable before-test-conditions specified in section 1.2.0 are met before beginning the TSI inspection. **Once the applicable before-test-conditions are met, follow the EIS prompts to conduct the TSI inspection**.

- The 2500 RPM test is first and runs for 30 seconds. Follow the EIS prompts to complete the 2500 RPM test.

- Upon completion of the 2500 RPM test, the EIS will transition to the idle test. Return the throttle to idle and complete the idle test as prompted by the EIS.

- The EIS may prompt special test sequences for vehicles with known test incompatibilities. These special test sequences accommodate unique vehicle designs and must be followed exactly. **Not following the sequence could result in vehicle damage**.

- Inspectors shall not artificially load the engine to achieve a testable idle RPM. This includes, but is not limited to, putting vehicle into gear and turning accessories on.

Note: If the vehicle fails the TSI emissions test, the EIS will automatically prompt for an additional conditioning procedure, and then transition to a second chance emissions test.

1.2.3 Emission Test Abort Conditions (ASM/TSI)

If an inspector determines the vehicle is unsafe, unfit, or incompatible with the tailpipe emissions inspection, they shall reject the vehicle from the inspection, or if the inspection has started, abort the inspection. Examples of unsafe, unfit, and incompatible conditions include, but are not limited to:

- Unsafe - gasoline leaks, large coolant leaks, faulty brakes, tire failure;

- Unfit - low oil pressure, overheating, idle RPM outside of required limits;

- Incompatible - traction control will not disengage.

The EIS will automatically abort the inspection for the following reasons:

- Test equipment failure;
- Test equipment power loss;
- The ASM test has been restarted more than twice; or
- Vehicle unable to achieve the required ASM speed.

In the case of an inspection abort, the EIS will display a list of abort codes. Select the code(s) that best describes cause of the inspection abort.

If “OTHER” is used as the reason for abort, the inspector must document the specific reason(s) for the aborted inspection on all copies of the Vehicle Inspection Report.

1.2.4 Exhaust Dilution/Sample Dilution

Sample dilution can be caused by an exhaust leak, but does not necessarily require exhaust system repair to inspect the vehicle.

- A Smog Check inspection is not intended to sell exhaust work on a testable vehicle. Of course, any time an inspector finds a potential safety hazard, such as an exhaust leak, the inspector should notify the customer and note the problem on all copies of the repair order.
- If there is an opening in the exhaust system that will allow the inspector to safely insert the probe properly without causing damage to the vehicle, the inspector may use it to obtain the sample **as long as the opening is downstream of all emission control components** (such as a catalytic converter).

Visual Inspection

1.3.0 Visual Inspection

Inspectors shall conduct the visual inspection in accordance with the inspection procedures described in this manual and as prompted by the EIS or OIS. No person shall enter any false emission control system information for the vehicle being tested. Nor shall any person enter any emission control information for any vehicle other than the one being tested. The visual inspection also includes a Liquid Fuel Leak inspection and Visible Smoke Test. (see sections 1.3.3 and 1.3.4.)

1.3.1 Visual Inspection Procedures

Vehicle Emission Control Requirements: Inspectors must use all available information necessary to determine the vehicle's emission control requirements, including but not limited to:

- the underhood emission control label (see section 1.3.2);
- a current emission control application guide;
- emission control repair manuals;
- emission component location guides;
- manufacturer emission control recalls;
- vacuum hose routing diagrams;
- California Air Resources Board (CARB) aftermarket parts listings;
- the aftermarket part label (see section 1.3.2);
- and any reliable vehicle manufacturer sources.

Note: Some diesel-powered vehicles are equipped with a second or additional emission control label affixed to the engine.

Pass/Fail Criteria: To pass inspection, the required emission control system(s) must be complete and installed in accordance with the vehicle manufacturer's original California or Federal certified configuration, or, when applicable, in accordance with a CARB aftermarket configuration. If any required emission control systems are found to be tampered or defective, the vehicle shall fail the inspection. For tampered and defective definitions, see section 1.3.5.

If a vehicle is equipped with parts that modify the original emission control configuration, inspectors must verify whether those parts are CARB approved or exempted. If the installed parts are not CARB approved or exempted, and the original emissions control configuration has been modified, the corresponding emission controls are considered "Modified" and the vehicle shall fail the inspection. For more information regarding verification of aftermarket parts, see Appendix C.

Not all aftermarket parts modify the original emission control configuration, and therefore do not require CARB approval. For more information, see the "Aftermarket Parts Verification Guidelines", located in Appendix C.

To verify CARB approval, inspectors must check the Aftermarket Parts Label affixed either directly to the part or near the part. This label contains a CARB Executive Order (EO) number that can be used to verify approval. Using the EO number, reference the CARB EO parts listings and/or part manufacturer catalog to verify approval. The CARB EO parts listings contain information about parts with CARB EO numbers, the part manufacturers and the applicable vehicles on which the parts can be installed. The CARB EO part listings and information about catalytic converters can be found on the CARB website: www.arb.ca.gov. Inspectors may also contact ARB at (800) 242-4450 if they need additional information. The CARB aftermarket parts listings may also provide information about modifications that are necessary and acceptable for installation of a particular part, kit or system.

Inspection: Inspectors must inspect all of the following emission control systems, as applicable to the vehicle being tested, and enter the inspection results as prompted by the EIS or OIS. Inspectors are prohibited from entering "Not Applicable" for an emission control system that is in fact required for the vehicle undergoing inspection.

Check that each system is complete and installed per the vehicle manufacturer's original configuration or, when applicable, a CARB approved aftermarket configuration. The inspection shall include, but is not limited to any required: component, computer, hose, module, motor, pump, seal, sensor, solenoid, switch, servo, transducer, tube, valve, and wire.

Emission Control Systems
Crankcase Emission Controls ➢ Positive Crankcase Ventilation (PCV) – Gasoline/Diesel ➢ Crankcase Depression Regulator (CDR) – Diesel ➢ Crankcase Ventilation (CCV) – Diesel ➢ Any other crankcase control system
Thermostatic Air Cleaner (TAC/ACL) – Gasoline
Fuel Evaporative System (EVAP) – Gasoline Inspectors are not required to perform disassembly of the vehicle to inspect the fuel evaporative system. Visual inspection of the fuel cap is considered part of the Fuel Cap Integrity Test detailed in Section 1.4.5, and therefore is not required on 1996 and newer model year vehicles.
Exhaust Gas After-Treatment System ➢ Catalytic Converter(s) – Gasoline/Diesel ➢ Diesel Oxidation Catalyst (DOC or OC) – Diesel ➢ NOx Adsorber – Diesel ➢ Periodic Trap Oxidizer (PTOX) – Diesel ➢ Diesel Particulate Filter(s) (DPF) – Diesel ➢ Selective Catalytic Reduction (SCR) – Diesel ➢ Any other exhaust gas after-treatment system Catalysts, filters and traps must be in original configuration with the same number of catalysts, filters and traps in place, unless changes are acceptable as part of a CARB EO approval/exemption.

Emission Control Systems
Exhaust Gas Recirculation (EGR) – Gasoline/Diesel
Ignition Spark Controls (SPK) – Gasoline Ignition spark controls are mechanical or electronic devices, mechanisms or systems that control ignition timing. All computer controlled vehicles are equipped with spark controls.
Fuel Metering System – Gasoline/Diesel Carburetion and Fuel Injection Inspection includes: Air Flow Meters, Injectors, Throttle Bodies, Throttle Positioners, Anti-"Dieseling" Solenoids, Early Fuel Evaporative, Choke Controls, Deceleration Controls, and Dashpots.
Air Injection System – Gasoline
Computers, Sensors, and Switches (Computer-controlled vehicles only) – Gasoline/Diesel Examples include: pressure, temperature, and oxygen sensors.
Other Emission Related Components/System The Other Emissions Related Components category encompasses emission control systems that are required by the vehicle manufacturer but not otherwise addressed in the visual inspection menu. Other Emission Related Components include, but are not limited to: ➢ *Add-On Aftermarket Parts* ➢ *Cylinder Heads* ➢ *Exhaust Manifolds* ➢ *Intake Manifolds* ➢ *Superchargers* ➢ *Thermal Reactors* ➢ *Timing Gears and Pulleys* ➢ *Turbochargers* ➢ *Ozone Reducing Radiators* If a vehicle fails the Other Emissions Related Components category of the visual inspection, inspectors must document on the VIR what emissions system failed. Note: For BAR-97 only the Other Emissions Related Components field is also used to capture failed test results for the Visible Smoke Test. For more information, see section 1.3.4.

1.3.2 Emission Control System Labels

Underhood Emission Control Label: Each vehicle's underhood emission control label serves as the primary source for emissions control requirements and to indicate the vehicle's certification type (California and Federal). It is important to review emission control components on this label, since emission control system technology changes and varies between vehicle manufacturers. A missing or illegible emission control label does not constitute an inspection failure. In cases where the emission control label is missing or illegible, the inspector may proceed with the inspection provided that the required emission controls can be determined using other sources as described in section 1.3.1. Note: Some diesel-powered vehicles are equipped with a second or additional emission control label affixed to the engine.

BAR Referee Label: When inspecting a SPCNS, grey market vehicle, vehicle with an engine change, or vehicle with a fuel conversion change look for a BAR Referee Label. The BAR Referee Label serves as the primary emission control information source for these vehicles. If a BAR Referee Label is not present, inform the customer to contact the BAR Referee for inspection information. When equipped with a BAR Referee Label, these vehicles may be inspected and certified by a licensed Smog Check station. Inspectors must inspect the vehicle using the emission control requirements listed on the BAR Referee label.

BAR Referee Labels are typically affixed to the driver's side door post or, in some cases, located under the hood. In some cases, the BAR Referee Label may provide special or additional instructions. An SPCN, gray market, or vehicle with an engine change without a BAR Referee Label must be first inspected at the Referee.

Aftermarket Parts Label: CARB approved or exempted parts are subject to CARB aftermarket parts labeling requirements. These requirements specify that Aftermarket Parts Labels (APL) must be affixed or stamped on approved/exempted parts or, if not practical, installed near the approved/exempted parts. The labels are required to contain an EO number that can be used to verify CARB approval or exemption, as outlined in section 1.3.1. Note: A missing or illegible APL does not constitute an inspection failure. In cases where the label is missing or illegible, the inspector may proceed with the inspection, provided the parts can be confirmed as CARB approved or exempted by comparing the part number marked on the part with the CARB EO parts listings or the parts manufacturer catalog.

1.3.3 Liquid Fuel Leak Inspection (Gasoline Only)

The liquid fuel leak inspection shall be conducted with the engine running. **Use extreme caution when working around moving parts and ensure the transmission is in "park" or "neutral" with the parking brake on.**

Definition: For the purpose of conducting this inspection, a "liquid fuel leak" is defined as any fuel coming from a vehicle's fuel delivery, metering, or evaporative systems, (1) in liquid form that has created a visible drop of fuel (or more) on a component of a vehicle's fuel delivery, metering or evaporative system, or (2) has created a fuel puddle on, around, or under a component of a vehicle's fuel delivery, metering, or evaporative system.

Inspection: With the engine running, the inspector shall visually inspect the following components of the vehicle, if they are exposed and visually accessible, for liquid fuel leaks:

- Gasoline fuel tanks
- Carburetors
- Fuel injectors
- Gasoline fill pipes – associated hoses, tanks, connections
- Gas caps
- Fuel pressure regulators
- External fuel pump
- Charcoal canisters
- Fuel delivery and return lines
- Any valves connected to any other fuel evaporative component
- Fuel vapor hoses
- Fuel Filters

For gasoline-powered hybrid vehicles and those vehicles with stop-start systems, the inspector shall visually inspect for liquid fuel leaks with the vehicle in the key on, engine off (KOEO) position or “Ready” state (so that the vehicle’s fuel system is at its operating pressure).

Pass/Fail Criteria: If no liquid leak is found, the vehicle shall pass inspection and the inspector shall enter “P” (pass) in the EIS or OIS “Fuel Leaks” prompt. If a liquid fuel leak is detected, the vehicle shall fail inspection and inspector shall enter “F” (defective) in the EIS or OIS “Fuel Leaks” prompt. Inspectors must indicate on the vehicle inspection report (VIR) the location of any liquid fuel leak.

The liquid fuel leak procedure is a visual inspection only. Inspectors are not required to perform disassembly of the vehicle to inspect for liquid fuel leaks. No special tools or equipment, other than a flashlight and mirror, are required and no raising, hoisting, or lifting of the vehicle is required.

An inspector shall refuse to inspect or abort an inspection if a liquid fuel leak presents a safety hazard.

The liquid fuel leak shall not apply to vehicles fueled exclusively by diesel, compressed natural gas (CNG), liquefied natural gas (LNG) or liquefied petroleum gas (LPG).

1.3.4 Visible Smoke Test

Gasoline and diesel vehicles, excluding hybrids, which are subject to a Smog Check inspection, must be tested for visible smoke. Other than the time when the snaps are performed and the EIS/ OIS data entry prompts, the Visible Smoke Test procedures are the same for gasoline and diesel vehicles. However, the pass/fail standards are different. The full procedures are located in Appendix A (Gasoline) and Appendix B (Diesel).

Summary of Test Procedures:

- Idle Test - Observe the tailpipe exhaust plume of the vehicle for 10 seconds.
- Crankcase Test - Observe the engine crankcase for 10 seconds.
- BAR Snap Test - Quickly push-and-release the accelerator pedal from idle position to between 2,000 and 3,000 RPM, then immediately allow the engine to return to idle.
- Enter the test result into the EIS or OIS.
- Document any failure on the Vehicle Inspection Report, and the customer’s invoice.

1.3.5 Visual Inspection Result Definitions

Tampered

An emissions control system or component that is missing, modified, or disconnected.

Reference: California Code of Regulations (CCR) § 3340.41.5

Missing

All or part of an emissions control system or component which has been removed from the vehicle or engine.

Reference: CCR § 3340.41.5 (a)

Modified

- An emission control system or component has been modified if:
- It has been disabled even though it is present and properly connected to the engine and/or vehicle;
- It has been replaced with a component not marketed by its manufacturer for street use on the vehicle;
- An emissions related component of the system has been changed such that there is no capacity for connection with or operation of other emissions control components or systems.

Reference: CCR § 3340.41.5 (b)

Disconnected

Any hose, wire, belt or component, which is required for the operation of the emission control system is present, but has been disconnected.

Reference: CCR § 3340.41.5 (c)

Defective

Any normal wear, deterioration, or unintentional disturbance that will affect the operation of an emissions control component or system. It is not a condition that occurs as a result of tampering. An unintentional disturbance includes, but is not limited to, a hose, wire, cap, or thermal valve or switch, disturbed and not reconnected or corrected when the vehicle was serviced.

Not Applicable

This entry may only be used when the vehicle is not originally equipped with the particular emissions control component being inspected, or when a particular test cannot be performed due to vehicle incompatibility with inspection equipment. For example, a vehicle did not originally come with an EGR valve from the factory, or a fuel cap adapter does not exist for the vehicle.

Emission Control Functional Tests

1.4.0 Functional Test Application

Inspectors shall complete the functional tests in accordance with the inspection procedures described in this manual and as prompted by the EIS or OIS. Inspectors shall not falsely enter “Not Applicable,” “No,” or otherwise skip a functional test required for the vehicle being tested.

All stations (including Test-Only stations) must follow the procedures specified by the vehicle manufacturer necessary to perform required Smog Check functional tests. Example: To check the base ignition timing, an underhood emission control label specifies that the engine speed must be set (raised) to 1000 RPM and then returned to 700 RPM upon completion.

1.4.2 Malfunction Indicator Light (OBD I and OBD II)

When applicable, the malfunction indicator light (MIL), or “Check Engine Light”, shall be checked on all vehicles equipped with either a first generation (OBD I) or second generation (OBD II) on-board diagnostics system. Enter “N” when not applicable.

To check MIL function, the inspector shall turn the ignition to the “key on engine off” (KOEO) position, observe the MIL operation and then start the engine “key on engine running” (KOER). The MIL should illuminate in the KOEO position and extinguish when the engine is started and in the KOER position. A brief period of illumination during start up is normal. Always follow the EIS or OIS prompts to enter test results.

Pass/Fail Criteria:

- A “Pass” entry indicates that the MIL properly operates, and service or repairs are not needed.
- A “Fail” entry indicates that the MIL does not illuminate at all in the KOEO position, or the MIL illuminates continuously or flashes with the engine running during the functional test of the MIL.

The KOEO/KOER procedures may vary for keyless ignition systems and some conventional key systems. In these cases, use the vehicle manufacturer procedure to complete the “KOEO/KOER” sequences.

> Note: Maintenance reminders are not part of the Smog Check inspection. Do not confuse a maintenance reminder, based on time and mileage, with the MIL.

1.4.3 OBD II Functional Test

Vehicles without an OBD II system, as determined by the underhood emission control label, shall not receive an OBD II functional test. Most vehicles with a GVWR greater than 14,000 lbs. are not equipped with an OBD II system.

The OBD II functional test evaluates and reports the status and/or results of the readiness indicators, system faults, and MIL.

- Inspectors must use all available information necessary to determine the vehicle’s OBD II requirements, including but not limited to, the underhood emission control label (see section 1.3.2), a current emission control application guide, emission control repair manuals, emission component location guides, manufacturer emission control recalls, BAR OBD technical advisements, and any reliable vehicle manufacturer sources.

- Follow the EIS or OIS test prompts to connect the EIS or OIS test lead to the Diagnostic Link Connector (DLC).

DLC Location: Most DLCs are located on the dashboard between the driver's side of the instrument panel and the middle of the passenger side. Some manufacturers, however, chose other locations. If you are unable to find the DLC, refer to the appropriate electronic component location manual or emission control diagnostic and repair manual. The DLC provides an RPM signal that in most cases can be used during Smog Check emissions test sequences.

Pass/Fail Criteria: The EIS or OIS may include an assessment of the OBD II system's ability to communicate, the readiness of system monitors, diagnostic trouble codes, vehicle identification, existence of system modifications and the MIL command status.

1.4.4 Ignition Timing Test

The Ignition Timing Test applies to 1976 to 1995 model-year vehicles equipped with adjustable timing. If the underhood emissions control label, an emissions application guide, or other reliable manufacturer derived references indicates timing is not adjustable, then the Ignition Timing Test is not required.

Inspectors shall check the base ignition timing using the vehicle manufacturer procedures. Many underhood emission control labels provide procedures and specifications for checking the ignition timing. If the procedures are not on the label, refer to an emission control application guide or an appropriate service manual. If no manufacturer's engine speed tolerance is given for the timing check, the idle speed shall be within 100 RPM of the manufacturer's specified idle speed

Pass/Fail Criteria: To pass inspection, the base ignition timing must be within 3 degrees (± 3 degrees) of the manufacturer specification. If it is more than 3 degrees from manufacturer specification, the vehicle shall fail the functional test. Note: If the manufacturer specification provides a range, the 3 degree additional tolerance described above is not allowed.

Mechanical Defect(s): If the timing cannot be measured due to a mechanical defect, such as a slipped harmonic balancer, the vehicle shall fail the timing test. The EIS includes a provision to account for mechanical defect. Follow the EIS prompts and document the mechanical defect on the Vehicle Inspection Report.

1.4.5 EGR System Functional Test

All 1995 model-year and older vehicles equipped with EGR and subject to a two-speed idle test shall undergo the EGR functional test.

Inspectors must follow the functional test procedures prescribed by the vehicle manufacturer.

1.4.6 Fuel Cap Integrity Test

As prompted by EIS, perform the fuel cap integrity test on all 1976 to 1995 vehicles, equipped with evaporative controls that can operate on gasoline, including dual/bi-fueled vehicles.

The fuel cap integrity test is a two part test.

Visual inspection: As prompted by the EIS, inspect the fuel cap(s) for proper fit and installation. The inspection result entries are “P” for Pass, “F” for Fail and “S” for Missing. If the fuel cap threads are stripped or the fuel cap seal is missing or damaged, or the fuel cap is not designed for the vehicle, the fuel cap shall fail the visual inspection.

Functional check: This check applies only to vehicles equipped with evaporative emission control systems. Check the fuel cap tester application manual to determine the correct cap adapter. Following the EIS and cap tester prompts, attach the fuel cap(s) to the adapter and perform the test. The test results are automatically captured by the EIS. If no adapter is available from the tester manufacturer (for the vehicle being tested), enter “No adapter available” as prompted by the EIS. For vehicles newer than 1995 do not perform the functional test, enter “No Adapter is available” as prompted by the EIS.

Fill Pipe Restrictor Functional Test – REPEALED (MARCH 2015)

The fill pipe restrictor test no longer applies. The EIS may prompt for the fill pipe restrictor test for vehicles undergoing an initial Smog Check inspection. If so, enter “N” into the EIS fill pipe test prompt.

1.4.7 Low Pressure Fuel Evaporative Test

Test Application: The Low Pressure Fuel Evaporative Test (LPFET) shall be performed on all 1976-1995 model-year vehicles (based on chassis model year) with the exception of the following:

- Vehicles not originally equipped, and not required by state or federal law to be equipped, with a fuel evaporative control system;
- Vehicles with two or more fully operational fuel tanks;
- Vehicles powered exclusively by diesel, compressed natural gas (CNG), liquefied natural gas (LNG), or liquefied petroleum gas (LPG);
- Vehicles for which there are no fuel LPFET filler neck adapters;
- Vehicles in their original factory configuration, with a fuel evaporative canister and fuel vapor hoses that are not accessible or would require the partial dismantling of the vehicle in order to gain access to them for testing. The inspector shall note the vehicle’s canister location on the Vehicle Inspection Report for these vehicles.
- Vehicles with single fuel tanks greater than 50 gallon capacity.

Inspectors shall enter “N” at the EIS Fuel Evaporative Test prompt when inspecting any of the vehicles listed above.

Inspection: Smog Check stations and Smog Check inspectors shall perform the low pressure test of a vehicle's fuel evaporative systems, using a BAR certified low pressure fuel evaporative tester (LPFET). The test shall be performed in accordance with the test procedures and specifications contained in the LPFET instruction manual provided by the tester manufacturer, and the following, as applicable:

- If components related to the vehicle's fuel evaporative system *tank side* are missing, modified, disconnected, or defective enter "N" (not applicable) at the EIS Low Pressure Fuel Evaporative Test prompt. If the vehicle's *tank side* fuel evaporative system components are not missing, modified, disconnected, or defective proceed with the test. *Tank side* means the portion of the fuel evaporative system between the canister pinch or seal point and the fuel tank filler neck. (*Tank side* visual inspection failures can affect the LPFET. Therefore, in cases where a *tank side* visual inspection failure exists, the LPFET does not apply). Note: Evaporative system visual inspection results must be entered at the EIS Evaporative System Visual Inspection prompt; see section 1.3.1.

- At the conclusion of the test, the LPFET displays a P (pass), enter P in the EIS at the Fuel Evaporative Test prompt.

- At the conclusion of the test, the LPFET displays an F (fail), perform a seal check in accordance with the procedures and specifications contained in the LPFET instruction manual provided by the tester manufacturers.

    - If, after completion of the appropriate seal check, the system is found to be properly sealed, enter F (fail) in the EIS at the Fuel Evaporative Test prompt.

    - If, after completion of the appropriate seal check, the system is found not to be properly sealed follow the applicable procedures and specifications contained in the LPFET instruction manual provided by the tester manufacturers to correct the leaks and effect proper seals.

- After all leaks have been corrected, a verification test shall be performed in accordance with the procedures and specifications contained in the LPFET instruction manual provided by the tester manufacturers.

    - If, at the conclusion of the verification test, the LPFET displays a P (pass), enter P in the EIS at the Fuel Evaporative Test prompt.

    - If, at the conclusion of the verification test the LPFET displays an F (fail), enter F in the EIS at the Fuel Evaporative Test prompt.

Depressurization: At the completion of the test and any necessary verification test, follow the procedures and specifications contained in the manufacturer's LPFET instruction manual, to depressurize the evaporative system, remove the tester and return the fuel evaporative system to its original configuration.

Nothing in the LPFET procedures shall excuse a station or an inspector from completing the Visual Inspection described in section 1.3.0 or the Liquid Fuel Leak inspection described in section 1.3.3.

Smog Check Inspection Results

1.5.0 Vehicle Inspection Report

Print at least two copies of the Vehicle Inspection Reports (VIR) for each Smog Check inspection. The licensed station shall give a copy of the VIR to the customer and keep a copy for the station's records. The VIR shall be attached to the customer's invoice.

- If the EIS or OIS does not print the VIR, the station will need to correct the malfunction and reprint the VIR.
- The licensed inspector must sign all copies of the VIR acknowledging that the inspection was conducted in accordance with all Smog Check requirements and that the information on the VIR is true and correct.
- When applicable, inspectors must document special circumstances on the VIR, including, but not limited to:
  - The location of a Liquid Fuel Leak
  - The emissions system or component that failed the "Other Emissions Related Component" category of the visual inspection
  - The reason for an "Other" inspection abort
  - The type of visible smoke test failure (tailpipe or crankcase)
  - CARB approved aftermarket parts and associated EO number

1.5.2 Vehicle Passes Smog Check

The EIS or OIS will issue a certificate of compliance when a vehicle passes all applicable portions of a Smog Check inspection. The certificate of compliance will electronically transmit to DMV and record in the VID.

Inform customers, whose vehicles pass their Smog Check inspection, that they must follow the instructions on the DMV paperwork they received to complete their registration renewal.

If the DMV paperwork has been lost or misplaced, inform the customer to contact the DMV Telephone Service Center at 1-800-777-0133.

1.5.3 Vehicle Fails Smog Check

A vehicle that fails any portion of the Smog Check inspection, but does not exceed the gross polluter emission standards, can be repaired and obtain a Smog Check certificate at any Test and Repair station. However, if the vehicle was originally *directed* (as shown on the DMV registration renewal notice), or exceeded the gross polluter standards, it may only receive after repair certification from a STAR Certified station or a BAR Referee.

Repair Data

1.6.0 Repair Information Entry

All repairs performed before, during, or after the Smog Check inspection at any station must be entered into the EIS or OIS, including any state subsidized repair, like the Consumer Assistance Program (CAP).

As applicable, inspectors shall enter accurate repair information as prompted by the EIS or OIS in either the Smog Check Inspection Mode or the Repair-Only Menu. If the retest is performed at your station, enter the repair information during the retest Smog Check inspection, as prompted. If the retest will not be conducted at your station, use the Repair-Only Menu to enter the repair information. Note: Accurate repair data provides a valuable source of information that can be used by other stations and that BAR uses for program evaluation.

Repair Costs

As prompted by the EIS or OIS, enter the repair parts and labor costs in whole dollars (no cents); round up or down to the nearest dollar.

For customer paid costs, enter all parts and labor charges, including any customer co-payments made for state subsidized repairs, tax and diagnosis costs.

For state subsidized repairs, enter all parts and labor costs to be paid by state, including tax and diagnosis costs.

Miscellaneous

1.7.0 Test Restrictions for Directed Vehicles

Directed Vehicles - Before conducting an inspection, stations not authorized to certify *directed* vehicles must check the DMV registration documents (when available) for a STAR station directed designation. If the vehicle is *directed*, the station/inspector shall inform the motorist of this certification restriction. *Directed vehicles* can only receive certification from a STAR certified Test-Only station, a STAR certified Test and Repair station, or BAR Referee station.

Gross Polluters - Vehicles found to exceed the gross polluter emission standards (*identified gross polluters*) are also restricted to certification from a STAR certified Test-Only station, a STAR certified Test and Repair station, or BAR Referee station. Stations not authorized to certify *identified gross polluters* shall inform the motorist of this certification restriction. Since the gross polluting vehicle certification restriction does not apply to government fleet vehicles, any station may inspect government fleet vehicles.

Note: When attempting to inspect a *directed vehicle or an identified gross polluter* at a station that is not authorized to certify *directed vehicles or identified gross polluters*, the EIS or OIS will prohibit the inspection, provided VID communication occurs. If VID communication does not occur, stations not authorized to certify *directed vehicles or identified gross polluters* must inform the customer that the vehicle could be *directed* or an *identified gross polluter* and, if so, a certificate issued by their station may be invalid.

When repairing *directed vehicles* or *identified gross polluters*, Test and Repair stations may use the EIS or OIS pre-inspection mode to verify repairs.

1.7.2 Gross Vehicle Weight Rating (GVWR) for Trucks and Motor Homes

When testing trucks and motor homes, the EIS or OIS will prompt the inspector to enter the gross vehicle weight rating (GVWR). Check the vehicle information label for the GVWR (label is typically found on driver door jamb). Note: Some labels list multiple “as equipped” GVWRs. In these cases, use the GVWR that corresponds to the vehicle as originally equipped by the vehicle manufacturer; e.g., Ford label on a Crown bus. If the GVWR cannot be determined, enter “NONE” and follow the EIS or OIS prompts to select a GVWR based on weight classification.

1.7.3 Pre-Inspection Mode

The pre-inspection mode provides an option to assess the vehicle’s OBD, emission controls and tailpipe emissions before undergoing the official Smog Check inspection. The pre-inspection procedure is identical to the official Smog Check inspection except that no certificate is generated and the vehicle is not subject to the gross polluter requirements, regardless of the emissions results. Pre-inspection test results are transmitted to the vehicle information database (VID) but a certificate is not transmitted to the DMV. The station shall provide the customer a copy of the pre-inspection vehicle inspection report (VIR).

If a customer chooses to authorize a partial pre-inspection, the licensed inspector or an authorized representative of the licensed Smog Check station shall inform the motorist that the partial pre-inspection will not fully indicate the likelihood of the vehicle passing a subsequent official inspection. An example of a partial pre-inspection is using the analyzer in manual mode to check tailpipe emissions only. The limitations of a partial pre-inspection must be fully disclosed to the customer both orally and in writing on the estimate and invoice.

1.7.4 Pre-Inspection Repair

With customer authorization and an estimate provided, licensed technicians may perform repairs on vehicles before or during the Smog Check inspection. Any repair must be appropriately documented on the invoice and entered into the EIS or OIS when prompted.

Any repair conducted during the inspection shall be limited to the following: replacement of the fuel cap(s) (EIS provides a mid-inspection fuel cap replacement opportunity upon a failed cap test), minor repairs of components damaged by the station personnel during the inspection at the station, or minor repairs such as the reconnection of hoses or vacuum lines. Any repair performed during the inspection must be completed before starting the emissions test portions of the Smog Check inspection, aside from the EIS prompted fuel cap replacement provision.

1.7.5 Virtual Hands-On Inspection

BAR or its designee may remotely interrupt a BAR-97 EIS or BAR-OIS inspection and ask the user to permit access to the computer and web camera, as specified in the Required Equipment/Materials table in Section 1.8.0, to perform a virtual hands-on inspection for purposes of observing the inspection process. During the virtual hands-on inspection, BAR may record screen shots, still images, video, text chat, and audio.

Equipment and Reference Material Requirements

1.8.0 Equipment and Reference Materials

STAR certified stations must possess all inspection related equipment to inspect all vehicle types, including directed vehicles. These stations must also possess the tools, and reference materials for the types of vehicles being inspected and/or repaired.

Non-STAR stations are only required to possess the equipment, tools and reference materials for the types of vehicles being inspected and/or repaired at a particular station.

Inspection equipment example: If your station is not STAR certified and only inspects 2000 and newer model-year gasoline powered, diesel-powered, and/or hybrid powered vehicles, then only the OIS inspection equipment is required.

Repair equipment example: When repairing diesel vehicles, a tachometer/dwell meter, propane enrichment kit, an ignition analyzer and timing light are not required.

- A dynamometer and NOx cell / bench are required to inspect enhanced area vehicles requiring an ASM test. Stations that only inspect heavy duty vehicles or stations in Basic and Change of Ownership program areas are not required to have a dynamometer and NOx cell / bench.

- If a station lacks the equipment, tools, and reference materials necessary to inspect and/or repair a particular vehicle, the station must reject the vehicle before starting an inspection or repair.

- If, as a matter of policy, a station does not inspect certain types of vehicles and/or repair certain types of inspection failures, the station must reject the vehicle before starting an inspection or repair.

- All station types must possess equipment in accordance with the “Equipment and Reference Material Requirements” table. Additional equipment may be required to inspect and/or repair certain vehicles in accordance with accepted trade standards.

- Reference materials may be in electronic or hardcopy format and must be provided in hardcopy format to BAR upon request.

Required Equipment/Materials	STAR Test Only	Test Only	STAR Test and Repair	Test and Repair	Repair Only
BAR Certified Equipment: BAR-97 Emissions Inspection System (EIS) with most current hardware and software.	✓	[11]	✓	[11]	
OBD Inspection System (OIS) with hardware and software necessary to conduct OBD inspections.	✓	[12]	✓	[12]	
BAR Certified Equipment: Data Acquisition Device (DAD) with hardware and software necessary to conduct OIS inspections.	✓	[12]	✓	[12]	
BAR Certified Equipment: Low Pressure Fuel Evaporative Tester (LPFET) and Operator’s Manual.	✓	[13]	✓	[13]	

[11] Required when performing a tailpipe emission inspection on vehicles.
[12] Required when performing the OBD test on model-year 2000 and newer vehicles.
[13] Required when inspecting 1976-1995 model-year vehicles with evaporative control systems.

Required Equipment/Materials	STAR Test Only	Test Only	STAR Test and Repair	Test and Repair	Repair Only
BAR Certified Equipment: Fuel cap, tester, adapters, and adapter guide.	✓	[13]	✓	[13]	
Web Camera: For every OIS and EIS, an external web camera hardwired to the OIS computer that meets the following requirements: autofocus, automatic light correction, built-in noise canceling microphone, USB 3.0 compliant, full HD (1920 x 1080 pixels) video recording and video calling at a minimum of 30 frames per second (FPS), H.264 video compression. Note: a single USB 3.0 extension cable is permitted to extend the camera's cable up to an additional 15 feet.	✓	✓	✓	✓	
Biometric Device: For every OIS and EIS, Fujitsu palm vein scanner sensor model FAT13FPS01 or newer with 2 meter long USB 2.0 (A) Male to (B) Micro - USB Cable.	✓	✓	✓	✓	
Ignition Timing Light capable of measuring ignition advance.	✓	[14]	✓	[14,15]	[15]
Hand vacuum pump and gauge	✓	[16]	✓	✓	✓
Tire pressure gauge	✓	✓	✓	✓	✓
Tools necessary to inspect vehicle ignition, fuel delivery, and emission control systems.	✓	✓	✓	✓	
Smog Check Manual & Reference Guide	✓	✓	✓	✓	✓
BAR ET Blasts dated after January 1, 2012, relevant to any vehicle inspection procedures.	✓	✓	✓	✓	
Emission control application guides	✓	✓	✓	✓	
Vacuum routing and electronic component location guides.	✓	✓	✓	✓	✓
Technical Service Bulletins and manufacturer recall notices.	✓	✓	✓	✓	✓

[14] Required when inspecting 1976-1995 model-year vehicles with adjustable timing.
[15] Required when inspecting and repairing vehicles with spark ignition engines.
[16] Required when inspecting 1976-1995 model-year vehicles.

Required Equipment/Materials	STAR Test Only	Test Only	STAR Test and Repair	Test and Repair	Repair Only
Diagnostic and repair information that may be printed or electronic form and may be nationally distributed and periodically updated references that contain repair and emissions procedures.			✓	✓	✓
Diagnostic and repair tools for ignition, fuel, emission control, computer engine control systems, and other related components for each vehicle type that the station diagnoses and repairs.			✓	✓	✓
Hand tools necessary to adjust maintain and repair vehicle ignition, fuel, and emission control systems			✓	✓	✓
Compression tester			✓	✓	✓
Tachometer/dwell meter			✓	✓	15
Fuel pressure gauge			✓	✓	✓
Propane enrichment kit			✓	✓	15
An ignition analyzer or ignition oscilloscope that displays at least: primary ignition system voltage and coil oscillations, and firing voltage and spark duration of the secondary ignition system. For distributor equipped vehicles, the device shall display this information for all cylinders at the same time.			✓	✓	15
A high impedance digital volt/ohm meter, and ammeter that measures amps and milliamps.			✓	✓	✓
A device capable of retrieving vehicle computer trouble codes, with its operating instructions. This device shall display and store live streaming OBD data, and shall have bi-directional capability. Hardware and software in the device shall be updated to the current available calendar year.			✓	✓	✓
An electronic device capable of graphically displaying electrical signals, with adjustable voltage and time scales. The device shall capture and display a high frequency abnormal signal, regardless of time scale or screen refresh rate.			✓	✓	✓
An electronic device capable of accessing the BAR's Web page for the purposes of entering repair data.			✓	✓	✓

1.8.1 Required Equipment Maintenance

All required equipment shall be up-to-date, maintained in good working condition, and calibrated in accordance with the manufacturer standards and applicable BAR specifications.

The BAR-97 Emissions Inspection System (EIS) shall be maintained and calibrated per the current BAR-97 EIS Specifications. The BAR-97 EIS shall be calibrated only with BAR approved gases from a BAR certified gas vendor.

The BAR-97 EIS and the OIS shall have the most current software and hardware updates required by BAR.

Only BAR authorized representatives or authorized manufacturer representatives shall have access to the locked areas of the BAR-97 EIS or to the components or software located within the OBD Data Acquisition Device (DAD) for service, inspection, or replacement, as necessary.

The LPFET shall be maintained and calibrated per the current LPFET Specification.

1.8.2 Required Equipment Electronic Transmission

Vehicle data and test results from the BAR-97 EIS and from the OIS shall be transmitted to the Vehicle Information Database (VID) via an Internet connection.

The OIS shall be connected to BAR's Web page through an Internet connection. The Internet connection may be shared with other devices, but must remain connected at all times.

1.8.3 Required Equipment Location

The BAR-97 EIS and the OIS shall be used within a building. The BAR-97 EIS and the OIS shall not be used in an environment that would subject them to excessive heat, cold, dust, or moisture.

The LPFET may be used either within or outside a building, but shall not be stored outdoors.

APPENDIX A

Visible Smoke Test Procedures for GASOLINE powered vehicles:

Step 1 - Vehicle Preparation

- Check that there are no obvious safety hazards (abnormal engine noise, overheating, leaking fluids, etc.). Inspectors may reject a vehicle that is unsafe to test.
- Place the transmission in “Neutral” or “Park,” with the parking brake on and/or wheel chocks in place.
- Turn off all accessories (including air conditioning).
- Ensure the vehicle is at normal operating temperature.
- Position the vehicle to ensure there are no drafts that can disturb the exhaust plume.
- Ensure there is nothing in the shop environment, such as equipment or tool boxes, which prevents the inspector from clearly observing the exhaust plume. In general, this will require clearing the line-of-sight as much as 15 feet from the tailpipe(s).

Step 2 - Test Preparation and Vehicle Familiarization

- Use any means necessary to enable observation of the vehicle’s exhaust plume, including but not limited to, adjusting the seat and mirror positions.
- Perform the first of three BAR Snap Tests:

  Gasoline: If using the BAR-97 EIS, the first snap shall be performed at the beginning of the inspection when the EIS screen enables you to stabilize the RPM. If using the OIS, perform the first snap when prompted.

- Ensure the vehicle’s engine RPM falls between 2,000 and 3,000 while performing the first BAR Snap Test. If it does not, you can do one of the following:
  - Press-and-release the accelerator pedal more quickly or more slowly as needed to stay within the designated RPM range; or Quickly press the pedal only part way to the floor before releasing it.
  - Do not check for smoke during the first BAR Snap Test. Any visible smoke observed during the first BAR Snap Test shall not result in a failure.

Step 3 - Perform the Idle Test

- Have the engine running at idle and go to the vehicle’s tailpipe.
- Perform the Idle Test:

  Gasoline: If using the BAR-97 EIS, the idle test shall be performed immediately after performing the ASM/TSI test, if these tests are performed. If using the OIS, perform the idle test when prompted.

- Observe the tailpipe(s) exhaust plume of the vehicle for 10 seconds.

Step 4 - Perform the Crankcase (PCV) Test

- After performing the Idle Test (Step 3), continue to leave the vehicle's engine running at idle and go to the vehicle engine compartment. Open the hood to the engine compartment and determine whether any smoke is coming from the crankcase (PCV) system.

- Observe the vehicle's crankcase system for 10 seconds.

Step 5 - Complete the BAR Snap Test

- Continue to leave the vehicle's engine running at idle.

- Perform the final two BAR Snap Tests just before starting the under-hood visual inspection.

- Perform the second BAR Snap Test while watching for visible smoke.

- Return the engine to idle and wait for at least 3 seconds to allow the engine to stabilize.

- Perform the third (and final) BAR Snap Test while watching for visible smoke.

Step 6 - PASS/FAIL Determination

- **PASS** the vehicle for the Visible Smoke Test portion of the Smog Check inspection if the vehicle does not emit smoke during the Idle Test, Crankcase Test, and both of the final two BAR Snap Tests.

- **FAIL** the vehicle if:

  - There is **any** visible smoke observed during the Idle Test;

  - ***OR*** there is **any** visible smoke coming from the crankcase (PCV) system;

  - ***OR*** there is:

    - **Gasoline - any** visible smoke observed between the tailpipe and 10 feet from the tailpipe(s) on either of the final two BAR Snap Tests.

    - Smoke from any area other than the vehicle's tailpipe(s) or crankcase (PCV) system, regardless of the cause, does not constitute a failure of the Visible Smoke Test.

    - No vehicle shall be failed for condensation or steam.

Step 7 – Enter the Test Results into the EIS or OIS

- Results must be entered in the visual inspection's "Other Emission Related Controls" category on the EIS or at the "Enter Result of the Exhaust System Smoke Check" and "Enter Result of the Crankcase System Smoke Check" OIS prompts.
- For vehicles that pass all portions of the Visible Smoke Test, enter "P" (Pass).

- For vehicles that fail any portion of the Visible Smoke Test, enter "F" (Defective).

The BAR-97 EIS currently allows only one entry for the visual inspection of all components covered under the "Other Emission Related Controls" category. Therefore, if the vehicle passes all portions of the Visible Smoke Test but fails a visual check of any other component covered under the "Other Emission Related Controls" category, enter the appropriate failure code. However, if the vehicle passes the visual inspection for components covered under the "Other Emission Related Controls" category, but fails any portion of the Visible Smoke Test, enter "F" (Defective) into the EIS.

Step 8 - Documentation Provided to the Customer

If the vehicle fails the Visible Smoke Test, the inspector shall:

- Document the failure on both the customer's and station's copy of the Vehicle Inspection Report (VIR) in the "Other Emission Related Components" section. Make a clear notation on the VIR, such as "Failed Visible Smoke Test". Document what portion of the Visible Smoke Test the vehicle failed, such as "Crankcase Smoke," "Idle Smoke," and/or "BAR Snap Smoke."

- Document the failure on the customer's invoice with "Failed Visible Smoke Test". Document what portion of the Visible Smoke Test the vehicle failed, such as "Crankcase Smoke," "Idle Smoke," or "BAR Snap Smoke."

APPENDIX B

Visible Smoke Test Procedures for DIESEL powered vehicles:

Step 1 - Vehicle Preparation

- Check that there are no obvious safety hazards (abnormal engine noise, overheating, leaking fluids, etc.). Inspectors may reject a vehicle that is unsafe to test.
- Place the transmission in “Neutral” or “Park,” with the parking brake on and/or wheel chocks in place.
- Turn off all accessories (including air conditioning).
- Ensure the vehicle is at normal operating temperature.
- Position the vehicle to ensure there are no drafts that can disturb the exhaust plume.
- Ensure there is nothing in the shop environment, such as equipment or tool boxes, which prevents the inspector from clearly observing the exhaust plume. In general, this will require clearing the line-of-sight as much as 15 feet from the tailpipe(s).

Step 2 - Test Preparation and Vehicle Familiarization

- Use any means necessary to enable observation of the vehicle’s exhaust plume, including but not limited to, adjusting the seat and mirror positions.
- **Do not** check for smoke during the first BAR Snap Test. Any visible smoke observed during the first BAR Snap Test shall not result in a failure.

Step 3 - Perform the Idle Test

- Have the engine running at idle and go to the vehicle’s tailpipe.
- Perform the Idle Test:
  - **Diesel** the idle test shall be performed at the appropriate OIS prompt.
- Observe the tailpipe(s) exhaust plume of the vehicle for 10 seconds.

Step 4 - Perform the Crankcase (PCV) Test

- After performing the Idle Test (Step 3), continue to leave the vehicle’s engine running at idle and go to the vehicle engine compartment. Open the hood to the engine compartment and determine whether any smoke is coming from the crankcase (PCV) system.
- Observe the vehicle’s crankcase system for 10 seconds.

  Note: do not perform this test on vehicles originally equipped with an open crankcase.

Step 5 - Complete the BAR Snap Test

- Perform the first of three BAR Snap Tests:
- Ensure the vehicle's engine RPM falls between 2,000 and 3,000 while performing the first BAR Snap Test. If it does not, you can do one of the following:
  - Press-and-release the accelerator pedal more quickly or more slowly as needed to stay within the designated RPM range; or
  - Quickly press the pedal only part way to the floor before releasing it.
- Continue to leave the vehicle's engine running at idle.
- Perform the final two BAR Snap Tests.
- Perform the second BAR Snap Test while watching for visible smoke.
- Return the engine to idle and wait for at least 3 seconds to allow the engine to stabilize.
- Perform the third (and final) BAR Snap Test while watching for visible smoke.

Step 6 - PASS/FAIL Determination

- **PASS** the vehicle for the Visible Smoke Test portion of the Smog Check inspection if the vehicle does not emit smoke during the Idle Test, Crankcase Test, and both of the final two BAR Snap Tests.
- **FAIL** the vehicle if:
  - There is **any** visible smoke observed during the Idle Test;
  - **OR** there is **any** visible smoke coming from the crankcase (PCV) system;
  - **OR** there is:
    - **Diesel** - a visible smoke plume observed 5 to 15 feet from the tailpipe(s) that lingers for more than 3 seconds on either of the final two BAR Snap Tests.
    - Smoke from any area other than the vehicle's tailpipe(s) or crankcase (PCV) system, regardless of the cause, does not constitute a failure of the Visible Smoke Test.
    - No vehicle shall be failed for condensation or steam.

Step 7 – Enter the Test Results into the OIS

- Results must be entered at the "Enter Result of the Exhaust System Smoke Check" and "Enter Result of the Crankcase System Smoke Check" OIS prompts.
- For vehicles that pass a portion of the Visible Smoke Test, enter "P" (Pass) at the appropriate prompt.
- For vehicles that fail a portion of the Visible Smoke Test, enter "F" (Defective) at the appropriate prompt.

Step 8 - Documentation Provided to the Customer

If the vehicle fails the Visible Smoke Test, the inspector shall:

- Document the failure on both the customer's and station's copy of the Vehicle Inspection Report (VIR) in the "Other Emission Related Components" section. Make a clear notation on the VIR, such as "Failed Visible Smoke Test". Document what portion of the Visible Smoke Test the vehicle failed, such as "Crankcase Smoke," "Idle Smoke," and/or "BAR Snap Smoke."

- Document the failure on the customer's invoice with "Failed Visible Smoke Test". Document what portion of the Visible Smoke Test the vehicle failed, such as "Crankcase Smoke," "Idle Smoke," or "BAR Snap Smoke."

APPENDIX C

Aftermarket Parts Verification Requirements

As part of the Smog Check inspection, inspectors shall verify whether an exemption issued by the California Air Resources Board (ARB) is required for modified or add-on parts affecting emissions that have been installed on the vehicle undergoing inspection.

California Vehicle Code Section 27156, in part, prohibits modifications to emission control devices or systems without an exemption from ARB. This means aftermarket parts that modify or affect the original emission controls must be exempted through an ARB Executive Order (EO). In general, Modified Parts and Add-on Parts require an EO exemption, while Replacement Parts and Consolidated Parts do not require an exemption. For more information, see the definitions at the end of this appendix.

The Aftermarket Parts Verification table on the next page identifies which parts and emission control changes do and do not require verification of whether an applicable Executive Order is in effect. For the purpose of a Smog Check inspection, inspectors are only required to verify the EO as listed in this table. Any add-on or modified part not otherwise addressed on this table must have an EO and be verified during inspection. This document is not intended for manufacturers, distributors, or dealers of aftermarket parts.

Refer to any of the following for more information regarding ARB Executive Orders (EO):

- Part manufacturer's catalog
- ARB's Aftermarket Parts webpage, which can be found by searching ARB's website at http://www.arb.ca.gov.
- Call ARB at (800) 242-4450

Emission Control System	Aftermarket Parts Verification Add-on/Modified Part(s)/ECS Changes (Check marks in Gasoline/Diesel columns indicate verification of EO required during inspection)	Gasoline[1]	Diesel
Air Induction	**Air Cleaner/Assembly** – 1995 model-year and older without Thermostatic Air Cleaner. Changes are acceptable provided all required emission controls are connected.		
Air Induction	**Air Cleaner/Assembly** – 1996 model-year and newer and all years equipped with Thermostatic Air Cleaner.	✓	
Air Induction	**Air Flow Sensor**	✓	✓
Air Induction	**Intake Manifold[2]** – including diesel air horn or elbow		
Air Induction	**Intercooler** – Equipped with the original equipment turbocharger /supercharger.		✓
Air Induction	**Turbocharger/Supercharger** - Wastegate, pulleys, etc.	✓	✓

[1] Includes Hybrid Powered Vehicles.
[2] See Intake Manifolds in this Appendix for more information.

Emission Control System	Aftermarket Parts Verification Add-on/Modified Part(s)/ECS Changes (Check marks in Gasoline/Diesel columns indicate verification of EO required during inspection)	Gasoline[1]	Diesel
Computer Management	**Variable or Alternate Tuning Devices** – "Modules," "Chips," "PROMs" "Tuners," "Pods," or any device that modifies or conditions ECU inputs or outputs. Including but not limited to devices that plug into the ECU, wiring harness, or the OBD connector. (DLC plug-in telemetry or read-only devices are allowed without EO).	✓	✓
Exhaust	**Air Injection rails –** Minor configuration changes allowed		
Exhaust	**EGR system modifications.** (Aftermarket replacements do not require EO).	✓	✓
Exhaust	**Diesel Engine Exhaust Brake**		
Exhaust	**After Treatment Control(s) –** Catalyst[3], Diesel Particulate filers (DPF), sensors (O_2, NO_x, pressure, temp.), Diesel Exhaust Fluid (DEF) system, etc.	✓	✓
Exhaust	**Customized Exhaust** on vehicles without after treatment components, or installed after last required "Cat-Back" – Crossover pipes, Oversized pipes, etc.		
Exhaust	**Customized Exhaust** before last required after treatment component – Header[4] Heat Risers, Oversized pipes, etc.	✓	✓
Fuel	**Added or Alternative Fuel Kits** – Nitrous, propane, methanol, hydrogen, natural gas Biodiesel[5], etc.	✓	✓
Fuel	**Carburetor** – Changes not originally offered for the specific vehicle application, i.e. changing 2 to 4 barrel, 4 to 2 barrel, single to multiple carb, carb to fuel inj. Replacement carbs are okay when identified as such by the manufacturer.	✓	✓
Fuel	**Carburetor Related –** Choke Heat Stove for Headers, Under carburetor screen.		
Fuel	**Fuel System** – Adjustable fuel pressure regulators, Injectors, Injection pump.	✓	✓
Fuel	**Fuel System** – Diesel Lift Pump, Fuel Filters, Separators, fuel line magnets.		
Fuel	**Fuel Tank(s)** – Additional, Oversized.	✓	
Fuel	**Water Injection** – Vapor/Steam.		
Ignition (Gasoline)	**Ignition Bridge**		
Ignition (Gasoline)	**Ignition System Modification** – *Performance distributors, control modifications, etc*.	✓	
Other	**Air Conditioner Cut Out**		

[3] See Catalytic Converters in this Appendix for more information.

[4] Be aware that some vehicles are factory equipped with tubular exhaust manifolds that appear similar to aftermarket headers. Note: Any add on or modified part not otherwise addressed in this table must have an EO and be verified during inspection.

[5] See Biodiesel in this Appendix for more information.

Emission Control System	Aftermarket Parts Verification Add-on/Modified Part(s)/ECS Changes (Check marks in Gasoline/Diesel columns indicate verification of EO required during inspection)	Gasoline[1]	Diesel
Other	**Anti-theft System** – Primary ignition changes including engine start / stop controls.		
Other	**Camshaft –** Performance camshafts, adjustable gears, etc.	✓	✓
Other	**Engine Modifications** – Performance kits, cylinder head swaps, etc.	✓	✓
Other	**Governor**		
Other	**Hybrid Battery Enhancements** – Plug-in charger kits, added batteries, etc.		
Other	**Hose(s)** – Minor configuration changes are acceptable. Universal replacement hose in place of performed hose, etc.		
Other	**Oil Separator/Filter –** Crankcase gas filter.		
Other	**Throttle lockout system.**		

Emission Systems Inspection Details

Bio Diesel Conversion Kits

For the purposes of a Smog Check inspection, biodiesel kits installed on 1998-2003 model year vehicles are acceptable without an ARB EO exemption. ARB EO exemption is required for 2004 and newer vehicles.

Catalytic Converters

Smog Check Inspectors must check that all required catalytic converters (CATs) are present and appear to be properly installed. This includes making sure there are the correct number of CATs, that they are installed in the original location(s), and that they have no tampers or defects. A change in the number of converters is only acceptable when it is allowed pursuant to an EO exemption.

Since January 1, 2009, ARB has required that all aftermarket catalytic converters installed in California bear an EO number. If an EO number is not present and/or the wrong converter(s) is installed, the vehicle shall fail the catalyst visual inspection.

For OBDII Equipped Vehicles, inspectors shall use the EO number and corresponding part number to verify the part is approved for use on that specific vehicle configuration (e.g., year, make, model, engine, GVWR, fuel type, etc.). To conduct this verification, inspectors must check the ARB EO Aftermarket Catalytic Converter Database located on the ARB Web site. Each EO contains a catalog listing the applicable vehicles.

For Pre-OBDII Vehicles, inspectors shall use the EO number to verify the CAT falls within the correct vehicle category- PC-1, PC-2, T-1, T-2. Refer to ARB's Web site for a separate Pre-OBDII EO Listing containing the EO numbers and corresponding vehicle categories. Inspectors are not required to check specific vehicle application using the series or part numbers.

For older CATs without an EO label, use the general procedure described in the first paragraph above.

The ARB EO Aftermarket Catalytic Converter Database, Pre-OBDII EO Listing, and the ARB Installer's Checklist for New Aftermarket Catalytic Converters are located on ARB's Aftermarket Parts webpage, which can be found by searching ARB's website at http://www.arb.ca.gov.

The catalyst label format is as follows:

D-XXX-XX YYYYYY ZZZZ

D-XXX-XX: This is the ARB EO number.

YYYYYY: The manufacturer part number.

ZZZZ: The date of manufacture. The first two digits indicate the month, and the last two the year.

Intake Manifolds

For the purposes of a Smog Check inspection, an aftermarket intake manifold that includes provisions for the original equipment emission controls (EGR, TAC, fuel injection, carburetor, thermal switches, heat stove, exhaust cross-over etc.) is acceptable, provided the manufacturer markets the manifold as a replacement for the factory original. The replacement manifold may be made of a different material than the original, for example aluminum instead of cast iron.

ARB Definitions of Aftermarket Parts

"Add-on Part" means any aftermarket part which is not a modified part or a replacement part. (California Code of Regulations (CCR) Title 13 § 1900 (b) (1)).

- Some examples: Add-on supercharger, turbocharger and nitrous oxide kits.

"Consolidated Part" means a part which is designed to replace a group of original equipment parts and which is functionally identical to those original parts in all respects which in any way affect emissions (including durability). (CCR Title 13 § 1900 (b) (2)).

- Some examples: A parts manufacturer markets a replacement EGR assembly that consolidates the valve and backpressure transducer that were originally two separate components. (Note: A manufacturer may also consolidate part numbers to make the part application more universal).

"Modified Part" means any aftermarket part intended to replace an original equipment emission-related part and which is not functionally identical to the original equipment part in all respects which in any way affect emissions, excluding a consolidated part. (CCR Title 13 § 1900 (b) (14)).

- Some examples: Performance camshafts, adjustable camshaft gears, performance cylinder heads, performance engine kits, performance engine management components, and performance fuel injection components.

"Replacement Part" means any aftermarket part intended to replace an original equipment emissions-related part and which is functionally identical to the original equipment part in all respects which in any way affect emissions (including durability) or a consolidated part. (CCR Title 13 § 1900 (b) (20)).

- Some examples: Replacement air filter elements, spark plugs, spark plug wires, distributor caps, chromed valve covers, replacement EGR valves, and replacement carburetors. (Note: A replacement EGR valve or carburetor must be specified as replacement, by the part manufacturer, for the vehicle on which it is installed).