

Recommendations for Diesel Vehicle Inspection Procedures

Based on the information gathered from the vehicle testing performed during the joint ARB/BAR study on diesel vehicles subject to the Smog Check Program, recommended test procedures were developed for visual checks of required emission control devices, an OBD check, and a visible smoke test. The following test procedures are recommended:

I. Visual Checks

Technicians shall conduct visual checks in accordance with the inspection procedures described in the Smog Check Inspection Procedures Manual and as prompted by the EIS.

Step 1: Technicians must use all available information necessary to determine the vehicle's emission control requirements, including but not limited to, the under-hood emission control label, a current emission control application guide, emission control repair manuals, emission component location guides, manufacturer emission control recalls, vacuum/pressure hose routing diagrams, Air Resources Board (ARB) aftermarket parts listings, the aftermarket part label, and any reliable vehicle manufacturer sources.

Step 2: If a vehicle is equipped with parts that modify the original emission control configuration, technicians must verify whether those parts are ARB approved or exempted. (Not all aftermarket parts modify the original emission control configuration and therefore do not require ARB approval or exemption. For more information, see the Aftermarket Parts Verification Guidelines included in the Smog Check Reference Guide, and/or the ARB website, as described below). If the installed parts are not ARB 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.

Step 3: To verify ARB approval or exemption, technicians must check the Aftermarket Parts Label affixed either directly to the part or near the part. This label contains an ARB Executive Order (EO) number that can be used to verify approval or exemption. With the EO number, reference the ARB EO parts listings and/or part manufacturer catalog. The ARB EO parts listings contain information about parts with ARB EO numbers, the part manufacturers and the applicable vehicles on which the parts can be installed. The ARB EO part listings can be found on the ARB website at www.arb.ca.gov then choose "Aftermarket Parts". The ARB aftermarket parts listings may also provide information about modifications that are necessary and acceptable for installation of a particular part, kit or system.

Step 4: If the Aftermarket Parts Label is missing or illegible, the technician may proceed with the inspection, provided the parts can be confirmed as ARB approved or exempted by comparing the part number marked on the part with the ARB EO parts listings, or the parts manufacturer's catalog.

Step 5: Technicians must inspect the emission control systems as listed in Table 1 and enter the inspection results as prompted by the EIS. Check that each system is complete and installed per the vehicle manufacturer's original configuration or, when applicable, an ARB-approved aftermarket configuration.

Step 6: If any required emission control systems are found to be tampered or defective, the vehicle shall fail the inspection.

Table 1
BAR-97 Diesel Inspection Components

Use the existing BAR-97 inspection prompts...	...to record the visual inspection results of these Diesel ECS
Positive Crankcase Ventilation (PCV)	Crankcase Depression Regulator (CDR) or PCV.
Catalytic Converter	Diesel Oxidation Catalyst (DOC) OR (OC)
	Diesel Particulate Filter (DPF)
	Periodic Trap Oxidizer (PTOX)
	NOx Adsorber Catalyst
Selective Catalytic Reduction (SCR – Urea Injection)	
Exhaust Gas Recirculation (EGR)	Diesel EGR
Fuel Injection	Diesel Fuel Injection (DFI)
Oxygen Sensor and Connectors	Pressure sensors, temperature sensors, and Lambda (Oxygen) sensors
Wiring of Sensors/Switches/Computer	Wiring of Sensors/Switches/Computer
Vacuum Line Connections to Sensors/Switches	Vacuum Line Connections to Sensors/Switches
Other Emission-Related Components	Other Diesel Emission-Related Components
	Turbocharger (TC)/Supercharger, Cylinder Heads, Exhaust Manifolds, Intake Manifolds, Charge Air Cooler (CAC) and any other emissions-related components
	Diesel Visible Smoke Test

II. OBD Test (including OBDII Scan)

Diesel vehicles will be subject to the OBD tests. As with gasoline-powered CAN vehicles, diesel vehicles with the CAN protocol will be temporarily excluded from the OBDII portion of the inspection. The BAR-97 cannot perform the OBD scan for any vehicles with the newer Controller Area Network (CAN) OBD communication protocol.

On 1998-2003 diesel vehicles, performance of the OBD scan will be controlled by the BAR-97 software and the Vehicle Lookup Table (VLT). To prevent the vehicles from falsely failing the OBD scan, this process will rely on the technician to correctly identify the Certification Type (e.g. Federal or California) from the Vehicle Emission Control Information (VECI) label.

When the OBD test is performed, the technician shall:

Step 1: Determine that the dashboard MIL is operational by turning the ignition key to the "ON" position with the engine turned off (i.e., not running). The MIL will illuminate if it is operational.

Step 2: The MIL then must be checked for a light "ON", indicating a failing condition. All OBDII-equipped vehicles that are compatible that can be checked by the BAR-97 must be connected to the EIS when prompted.

Step 3: Finally, MIL status, OBD readiness status codes, and DTCs will be downloaded to the BAR-97 and automatically evaluated by the software.

- o The vehicle shall fail Smog Check when failing any portion of the ODB test.

III. Visible Smoke Test

Technicians shall use the following recommended visible smoke test procedure when testing diesel-powered vehicles. The Visible Smoke Test procedure consists of the following parts:

General Test Procedure

1. The Idle Test – With the engine at normal operating temperature, and running at idle. Observe the tailpipe exhaust plume of the vehicle for 10 seconds.
2. The Idle PCV/CDR Test – The technician shall get out of the vehicle with the engine idling, and look for visible smoke from the PCV/CDR system for 10 seconds.
3. The Snap Test – The technician shall push the accelerator pedal quickly from the idle position to between 2000 and 3000 RPM, then immediately release the accelerator pedal, allowing the engine to return to idle. For many vehicles, you will be able to quickly push the accelerator pedal all the way to the floor and stay within the designated RPM range.
4. Enter Test Result into the EIS.
5. Document any failure on the Vehicle Inspection Report and the consumers invoice.

Specific Test Procedures

When the technician performs the test, the following steps shall be followed:

Step 1 - Vehicle Preparation:

- o Position the vehicle to ensure that there are no drafts that can disturb the exhaust plume that could artificially disperse smoke from the exhaust.
- o Turn off all auxiliary engine cooling fans that are used for ASM testing.
- o Verify the engine is at normal operating temperature.
- o Verify that all vehicle accessories, including air conditioning, are OFF.
- o Ensure that the transmission is in "Park" (Automatic Transmission) or "Neutral" (Manual Transmission) with the parking brake set, and the wheels chocked.

Step 2 - Test Preparation and familiarization with the vehicle:

- o Setup any means necessary such as adjust the seating position and the mirror position to observe the exhaust plume during the snap test, and become familiar with the accelerator pedal and engine response.
- o Perform the first of three snap tests as defined above in #3. "The Snap Test".
- o Check the vehicle's engine RPM during the first snap test. If it does not fall between 2,000 and 3,000 RPM, 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.
- The technician shall ensure that the vehicle's engine speed does not exceed 3000 RPM.
- The technician shall not check for smoke during the first snap test and, any visible smoke observed during the first snap test will not result in a failure.

Step 3 – Perform the Idle Test and Observe Tailpipe Smoke:

- With the engine at normal operating temperature and running at idle.
- Go around to the vehicle's tailpipe.
- Observe the tailpipe exhaust plume of the vehicle for 10 seconds.

Step 4 - Idle Test of Crankcase (PCV/CDR) Smoke:

- Leave the vehicle's engine running at idle and go around to the vehicle engine compartment.
- Open the hood to the engine compartment, and locate any crankcase areas of concern.
- Continuously watch the crankcase (PCV/CDR) system for 10 seconds.

Step 5 – Perform the Snap Test and Observe Tailpipe Smoke:

- When prompted by the EIS for the "Other Emissions Related Components".
- Using means necessary such as looking out the rear window of the vehicle or using the vehicle's rear view mirrors, watch for visible smoke coming from the tailpipe(s) exhaust plume each time the engine RPM is increased.
- Perform the second of three snap tests as defined above in #3. "The Snap Test", while watching for visible smoke.
- Return to Idle, and wait for at least one second, and no more than five seconds.
- Perform the third (and final) snap test as defined above in #3. "The Snap Test", while watching for visible smoke.

Step 6 – PASS/FAIL Determination:

- **PASS** the vehicle for the visible smoke test portion of the inspection if the vehicle Passes all three smoke tests (Idle, Snap and PCV/CDR).
- **FAIL** the vehicle if
 - There is **any** visible smoke during the idle test
 - **OR** there is **any** visible smoke coming from the PCV/CDR system
 - **OR** there is a visible smoke plume coming from the vicinity of the tailpipe(s) exhaust plume on either of the last two Snap Tests **AND** the plume lingers for more than **3 seconds**.
- Smoke from any area other than the vehicle's tailpipe(s) or PCV/CDR system, regardless of the cause, does not constitute a failure of the Visible Smoke Test.
- No vehicle will be failed for steam. Steam is always white and usually evaporates quickly or condenses, while smoke may dissipate but never evaporates.

Step 7 - Entering Test Results into the EIS:

- For vehicles that meet the passing criteria above, enter "P" (Pass) in the "Other Emission Related Controls" category of the visual inspection portion of the Smog Check, when prompted by the EIS.

- For vehicles that fail the visible smoke check according to the criteria above, enter "F" (Defective) in the "Other Emission Related Controls" category of the visual inspection portion, when prompted by the EIS.
- Note: The 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 the visible smoke test but fails a visual check of any component covered under the "Other Emission Related Controls" category, enter the appropriate failure code: "D" (Disconnected), "M" (Modified) or "S" (Missing). However, if the vehicle passes the visual inspection for components including in the "Other Emission Related Controls" category but fails the visible smoke test, enter "F" (Defective) into the EIS.

Step 8 - Documentation Provided to Consumer: If the vehicle fails the Visible Smoke Test, the technician shall:

- Document the failure on the customer'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 for visible smoke," or "Failed visible smoke test." Write down what part of the visible smoke test the vehicle failed, such as "Failed Crankcase Smoke," "Failed Idle Tailpipe Smoke," or "Failed Snap Tailpipe Smoke".
- Document the failure on the customer's invoice with "Failed for visible smoke," or "Failed visible smoke test." Write down what part of the visible smoke test the vehicle failed, such as "Failed Crankcase Smoke," "Failed Idle Tailpipe Smoke," or "Failed Snap Tailpipe Smoke".
- Provide to the customer the Bureau's Diesel Test Consumer Information Sheet, with the applicable items completed on the checklist.

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