

State of California
AIR RESOURCES BOARD

PROPOSED

CALIFORNIA MOTOR VEHICLE
EMISSION CONTROL AND SMOG INDEX LABEL SPECIFICATIONS

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Amended: March 24, 1994
Amended: June 28, 1995
Amended: _____

NOTE: The regulatory amendments proposed in this rulemaking are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions from the version of the test procedures as amended on June 28, 1995. On June 28, 1995, the Board adopted new label specifications for heavy-duty vehicles. Additions to the text, which were adopted on June 28, 1995, are identified in *italics*. (These modifications have not yet been approved by the California Office of Administrative Law.) Modifications to the originally noticed text (August,

1995) are designated by *bold italics* and ~~*bold*~~ *strikeout* to represent additions and deletions, respectively.

State of California
AIR RESOURCES BOARD

**California Motor Vehicle Emission Control and
Smog Index Label Specifications**

1. **Purpose.** The Air Resources Board recognizes that certain emissions-critical or emissions-related parts must be properly identified and maintained in order for vehicles and engines to meet the applicable emission standards. The purpose of these specifications is: (1) to require motor vehicle or motor vehicle engine manufacturers to affix a label (or labels) on each production vehicle in order to provide the vehicle owner and service mechanic with information necessary for the proper maintenance of these parts in customer use and (2) to require that smog index labels be affixed to motor vehicle windows as provided in Health and Safety Code section 43200.5. These Emission Control and Smog Index Label Specifications are incorporated by reference in Section 1965, Title 13, California Code of Regulations.

2. **Applicability.**

(a) These specifications for tune-up labels, vehicle emission configuration bar-code labels, and vehicle identification number bar-code labels shall apply to all new 1979 and subsequent model-year passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty engines, and to all new 1982 and subsequent model year motorcycles certified to the applicable emission standards pursuant to California Health and Safety Code Sections 43100 and 43107.

(b) The specifications for smog index labels shall apply to all new passenger cars and light-duty trucks. This labeling requirement shall apply 90 days after both of the following occur be effective starting with the 1998 model year.

~~(1) The system required by subdivision (b) of Section 44060 of the Health and Safety Code for the electronic filing of certificates of compliance or noncompliance is determined to be operational by the Department of Consumer Affairs and that fact is reported by the department to the California Secretary of State.~~

~~(2) Both the San Diego County Air Pollution Control District and the Ventura County Air Pollution Control District have sufficient funds available to implement the pilot program established pursuant to subdivision (b) of Section 43705 of the Health and Safety Code, as determined by each of those districts and reported by each district to the California Secretary of State.~~

~~The labeling requirement for smog index labels shall become inoperative five years from the date determined above.~~

~~(b)~~(c) Any vehicles or classes of vehicles exempt from exhaust emission standards pursuant to ~~Article 2, Subchapter 1, Chapter 3~~, Title 13 of the California Code of Regulations shall also be exempt from the requirements of these specifications except Zero-Emission Vehicles (ZEVs) certified by the Air Resources Board for use in California.

~~(c)~~(d) The responsibility for compliance with these specifications shall rest with the motorcycle, light-duty vehicle, medium-duty vehicle, or heavy-duty engine manufacturer who certified such vehicles or engines.

3. **Emission Control Labels Content and Location.** A plastic or metal tune-up label, and in accordance with Section b, a machine-readable vehicle emission configuration (VEC) bar-code label made of paper, plastic, metal, or other permanent material, shall be welded, riveted or otherwise permanently attached to an area within the engine compartment (if any) or to the engine in such a way that it will be readily visible to the average person after installation of the engine in a vehicle. In accordance with Section b, a machine-readable vehicle identification number (VIN) bar-code label made of paper, plastic, metal, or other permanent material shall be affixed in a readily visible location to either the door-latch post next to the driver's seating position, the door edge that meets this door-latch post, or above the instrument panel in a location clearly visible through the lower left corner of the windshield.

In selecting an acceptable location, the manufacturer shall consider the possibility of accidental damage (e.g., possibility of tools or sharp instruments coming in contact with the label) and accessibility for a bar-code scanner, as applicable. Each label shall be affixed in such a manner that it cannot be removed without destroying or defacing the label, and shall not be affixed to any part which is likely to be replaced during the vehicle's useful life. For motorcycles, passenger cars, light-duty trucks, and medium-duty vehicles, the label(s) shall not be affixed to any equipment which is easily detached from the vehicle.

(a) The tune-up label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

- i. The label heading shall read: "Vehicle Emission Control Information" for passenger cars and motorcycles; "Important Vehicle Information" for light-duty and medium-duty trucks; and "Important Engine Information" for heavy-duty engines.
- ii. Full corporate name and trademark of the manufacturer.
- iii. For 1993 and subsequent model-year vehicles and engines designed to be capable of operating on fuels other than gasoline, the statement "This _____"

_____ (specify vehicle or engine, as applicable) is certified to operate on _____
_____ (specify operating fuels[s])."

- iv. Engine family identification, model designation, engine displacement (in cubic centimeters or liters), and for all 1993 and subsequent model-year vehicles the statement, "_____ (specify OBFD I or OBFD II, as applicable) certified" or "OBFD Exempt" for all 1990 and subsequent model-year vehicles which do not have an Air Resources Board approved on-board diagnostic system. Motorcycles and ZEVs are exempt from these requirements.
- v. Identification of the Exhaust Emission Control System: Abbreviations used shall be in accordance with SAE J1930, ~~JUN 1988~~ JUN 1993, including the following nomenclature unless the Executive Officer approves a more current version of SAE J1930 (ZEVs are exempt from these requirements):

OC -	Oxidation Catalyst Only;
TWC -	Three-Way Catalyst;
TWC+OC -	Three-Way Catalyst + Oxidation Catalyst;
* EHOc -	Electrically Heated Oxidation Catalyst;
* EHTWC -	Electrically Heated Three-Way Catalyst;
WU-TWC -	Warm-Up Catalyst with Three-Way Catalyst;
WU-OC -	Warm-Up Catalyst with Oxidation Catalyst;
AIR -	Secondary Air Injection (Pump);
PAIR -	Pulsed Secondary Air Injection;
CAC -	Charge Air Cooler;
SC -	Supercharger;
TC -	Turbocharger;
DFI -	Direct <u>Fuel</u> Injection (Diesel);
IDFI -	Indirect Diesel Injection;
FOCTOX -	Continuous Trap Oxidizer Continuous ;
FOPTOX -	Periodic Trap Oxidizer Periodic ;
* FFS -	Flexible Fuel Sensor;
O2S -	Oxygen Sensor;
HO2S -	Heated Oxygen Sensor;
EGR -	Exhaust Gas Recirculation;
EM -	Engine Modification;
CIS <u>CEI</u> -	Continuous Fuel Injection;
MPI <u>MFI</u> -	Multipoint port (Electronic) Fuel Injection, (<u>Central</u>) <u>Multipoint Fuel Injection</u> ;
TBI -	Throttle Body (Electronic) Fuel Injection;
SMP <u>SFI</u> -	Sequential Multipoint (Electronic) Fuel Injection; and
SPL -	Smoke Puff Limiter; and

- * Pending confirmation as SAE protocol

The Executive Officer shall recommend abbreviations for components not listed in SAE J1930, ~~JUN1988~~ JUN 1993.

- vi. For otto-cycle engines the tune-up specifications and adjustments recommended by the manufacturer, including, if applicable: valve lash, ignition timing, idle air fuel mixture setting procedure and value (e.g., idle CO, idle speed drop), and high idle speed. For diesel engines the specifications and adjustments recommended by the manufacturer, including, if applicable: initial injection timing, and fuel rate (in mm³/stroke) at advertised horsepower. For the specifications listed above, which are not recommended by the manufacturer for adjustment, the manufacturer shall include in lieu of the "specifications" the single statement "no other adjustments needed." These specifications shall indicate the proper transmission position during tune-up and what accessories, if any (e.g., air conditioner), should be in operation, and what systems, if any (e.g., vacuum advance, air pump), should be disconnected during the tune-up. For all vehicles except ZEVs, the instructions for tune-up adjustments shall be sufficiently clear on the label so as to preclude the need for a mechanic or vehicle owner to refer to another document in order to correctly perform the adjustments.
- vii. For motorcycles only, any specific fuel or engine lubricant requirements (e.g., lead content, research octane number, engine lubricant type).
- viii. For heavy-duty engines, the date of engine manufacture (month and year). A manufacturer may, in lieu of printing the month of manufacture on the engine label, maintain a record of the month of engine manufacture. The manufacturer shall submit this record to the Executive Officer upon request.
- ix. An unconditional statement of compliance with the appropriate model-year California regulations; for example, "This vehicle (or engine, as applicable) conforms to California regulations applicable to ___ model-year new _____ (for 1992 and subsequent model years, specify TLEV, LEV, ULEV, SULEV, or ZEV, as applicable) (specify motorcycles, passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty otto-cycle engines, or heavy-duty diesel engines, as applicable)." For federally certified vehicles certified for sale in California the statement must include the phrase "conforms to U.S. EPA regulations and is certified for sale in California." For Class III motorcycles for sale in California, the statement must include the phrase "is certified to ___ HC

engine family exhaust emission standard in California." For incomplete light-duty truck and incomplete medium-duty vehicles the label shall contain the following statement in lieu of the above:

"This vehicle conforms to California regulations applicable to ___ model-year new ___ (for 1992 and subsequent model years specify LEV or ULEV as applicable) vehicles when completed at a maximum curb weight of ___ pounds and a maximum frontal area of ___ square feet."

For 1994 and later model year heavy heavy-duty diesel engines to be used in urban buses that are certified to the optional emission standards, the label shall contain the following statement in lieu of the above:

"This engine conforms to California regulations applicable to ___ model year new urban bus engines and is certified to a NOx emission standard of ___ g/bhp-hr (for optional emission standards specify between 0.5 and 3.5 at 0.5 g/bhp-hr increments for 1994 and 1995 model years and between 0.5 and 2.5 at 0.5 g/bhp-hr increments for 1996 and later model years)."

For 1995 and later model year heavy-duty engines, other than those for use in urban buses, that are certified to the optional emission standards, the label shall contain the following statement in lieu of the above:

"This engine conforms to California regulations applicable to ___ model-year new heavy-duty engines, other than those for use in urban buses, and is certified to a NOx emission standard of ___ g/bhp-hr (for optional emission standards specify between 0.5 and 3.5 at 0.5 g/bhp-hr increments for 1995 through 1997 model-year diesel engines, between 0.5 and 2.5 at 0.5 g/bhp-hr increments for 1998 and later model-year diesel engines, between 0.5 and 2.5 at 0.5 g/bhp-hr increments for 1995 through 1997 model-year Otto-cycle engines, and between 0.5 and 1.5 at 0.5 g/bhp-hr increments for 1998 and later model year Otto-cycle engines)."

Manufacturers may elect to use a supplemental label in addition to the original label if there is not sufficient space to include all the required information. The supplemental label must conform to all specifications as the original label. In the case that a supplemental label is used, the original label shall be number "1 of 2" and the supplemental label shall be numbered "2 of 2."

- x. For 1985 and subsequent model year heavy-duty diesel engines and 1987 and subsequent model year heavy-duty otto-cycle engines, if the manufacturer is provided an alternate useful life period under the provisions of 40 CFR 86.085-21(f), 86.087-21(f), 86.088-21(f), 86.090-21(f), or 86.091-21(f) the prominent statement: "This engine has been certified to meet California standards for a useful life period of ___ years or _____ miles of operation, whichever occurs first. This engine's actual life may vary depending on its service application." The manufacturer may alter this statement only to express the assigned alternate useful life in terms other than years or miles (e.g., hours, or miles only).
- xi. For 1985 and subsequent model year heavy-duty diesel engines, the prominent statement: "This engine has a primary intended service application as a _____ heavy-duty engine." (The primary intended service applications are light, medium, and heavy, as defined in 40 CFR 86.085-2.)
- xii. For 1987 and subsequent model year heavy-duty otto-cycle engines, one of the following prominent statements as applicable:
 - (1) For engines certified to the emission standards under 40 CFR 86.087-10(a)(1)(i), 86.088-10(a)(1)(i), 86.090-10(a)(1)(i), 86.090-10(a)(1)(iii), 86.091-10(a)(1)(i), and 86.091-10(a)(1)(iii) the statement: "This engine is certified for use in all heavy-duty vehicles."
 - (2) For engines certified under the provisions of 40 CFR 86.087-10(a)(3)(i), 86.088-10(a)(3)(i), 86.090-10(a)(3)(i), 86.090-10(a)(3)(ii), 86.091-10(a)(3)(i), or 86.091-10(a)(3)(ii) the statement, "This engine is certified for use in all heavy-duty vehicles. It is certified to the emission standards applicable to heavy-duty vehicles with a gross vehicle weight rating above 14,000 lbs. and to U.S. EPA regulations applicable in California."
 - (3) For engines certified to the emission standards under 40 CFR 86.087-10(a)(1)(ii), 86.088-10(a)(1)(ii), 86.090-10(a)(1)(ii), 86.090-10(a)(1)(iv), 86.091-10(a)(1)(ii), or 86.091-10(a)(1)(iv) the statement: "This engine is certified for use only in heavy-duty vehicles with a gross vehicle weight rating above 14,000 lbs."
- xiii. For 1988 model heavy-duty otto-cycle engines and vehicles for which nonconformance penalties are to be paid in accordance with 86.1113-87(b), the following prominent statement: "The manufacturer of this engine/vehicle will pay a nonconformance penalty to be allowed to introduce it into commerce at an emission level higher than the applicable emission standard. The compliance level (or new emission standard) for this engine/vehicle is _____." (The

manufacturer shall insert the applicable pollutant and compliance level calculated in accordance with 86.1112-87(a).)

(1) The above statement shall be printed on the label required in these specifications or on a separate permanent legible label in the English language and located in proximity to the label required in these specifications. The manufacturer shall begin labeling production engines or vehicles within ten days after the completion of the Production Compliance Audit (PCA).

(2) If a manufacturer introduces an engine or vehicle into commerce prior to the compliance level determination of 86.1112-87(a), it shall provide the engine or vehicle owner with a label as described above to be affixed in a location in proximity to the label required in these specifications within 30 days of the completion of the PCA.

Such statements shall not be used on labels placed on vehicles or engines which, in fact, do not comply with all applicable California regulations, including assembly-line test requirements, if any.

(b) The machine-readable VEC bar code and the machine-readable VIN bar code shall be designed in accordance with SAE standards J1892 (OCT 1993) and SAE J1877 (JUL 1994) as appropriate for the label material. These labeling requirements shall be applicable to 1990 and subsequent model-year vehicles and engines except ZEVs, motorcycles, and diesel-fueled vehicles and diesel engines not subject to inspection and maintenance requirements. The Executive Officer may, as necessary, specify new character codes for the VEC label (as part of the "ECS Component Combination" table, Section 4.1.3., SAE J1892 (OCT 1993)) to designate new emission control systems or components as they are introduced for use in motor vehicles subject to the label requirements. For ZEVs, and ZEVs certified as HEVs because the fuel-fired heater operates above 40°F, the first eight characters of the VEC bar code label shall be ZZZZZZZZ.

The eighth character of the VEC bar-code label is the code for the Emission Control System (ECS) Combination and the engine ignition frequency. Coding for this character is as follows:

Ignition Frequency	Label Code	Air Injection	EGR	OBD II
One ignition frequency per two engine revolutions	A	none	none	no
	B	yes	none	no
	C	none	yes	no
	D	yes	yes	no
	E	none	none	yes
	F	yes	none	yes
	G	none	yes	yes
	H	yes	yes	yes
One ignition frequency per one engine revolution	S	none	none	no
	T	yes	none	no
	U	none	yes	no
	V	yes	yes	no
	W	none	none	yes
	X	yes	none	yes
	Y	none	yes	yes
	Z	yes	yes	yes

The ninth character of the VEC bar-code label is the code for the emission standard to which the vehicle was certified. This character shall apply to all 1998 and subsequent model passenger cars, light-duty trucks, medium-duty vehicles and heavy-duty engines. Coding for this character is as follows:

<u>TLEV</u>	A
<u>LEV</u>	B
<u>ULEV</u>	C
<u>ZEV</u>	Z
<u>TLEV HEV</u>	D
<u>LEV HEV</u>	E
<u>ULEV HEV</u>	F
<u>SULEV</u>	G
<u>Federally-Certified Vehicles</u>	H
<u>Title 13, CCR, Section 1960.1(f)(2) Vehicles</u>	L
<u>Title 13, CCR, Section 1956.8(a) Vehicles</u>	M
<u>Title 13, CCR, Section 1956.8(c) Vehicles</u>	N

The ninth character shall not be necessary if the sixth character of the VEC bar-code label correctly identifies the California emission standard to which the vehicle is certified.

For label identification, the VEC and VIN labels shall include the heading "VEC" and "VIN", respectively, above the bar coded information. If the VEC or VIN label is incorporated as part of the tune-up label or the federal certification label required pursuant to the Federal Motor Vehicle Safety Regulations No. 567, respectively, or at

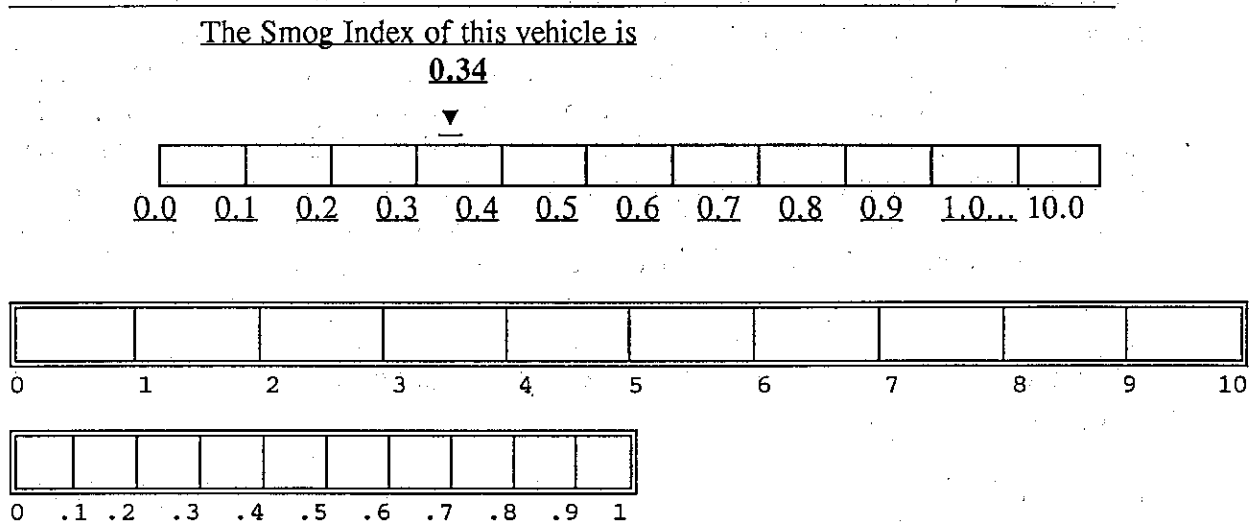
the location above the instrument panel, no heading shall be required. The heading shall be printed in block letters in the English language and printed pursuant to Section 5 of these procedures.

(c) The tune-up label shall include a vacuum hose routing diagram showing all emissions-related and emissions-critical parts that are actuated by vacuum and the correct routing of vacuum hoses if one or more vacuum hoses are employed. This diagram shall contain no more than two different vacuum hose routing patterns; if there are two routings on a single diagram each routing must be easily understandable. The hose diagram may be separated from the tune-up label provided that the vacuum hose diagram is placed in a visible and accessible position as provided in this section. If a separate label is used, it shall be of a permanent type; however the destruction limits in this section do not apply. ZEVs are exempt from these requirements.

(d) The manufacturer of any vehicle equipped with an emission control device which the Executive Officer has determined will be significantly impaired by the use of leaded gasoline shall:

- i. At the time of vehicle manufacture, affix two or more permanent legible labels specifying the appropriate operating fuel(s) (for example "Methanol Fuel or Unleaded Gasoline Only" for fuel-flexible vehicles) as follows:
 - (1) One label shall be located on the instrument panel so as to be readily visible to the operator of the vehicle: Provided, however, that the required statement may be incorporated into the design of the instrument panel rather than provided on a separate label; and
 - (2) One label shall be located immediately adjacent to each fuel tank filler inlet, outside of any filler inlet compartment, and shall be located so as to be readily visible to any person introducing fuel to such filler inlet: Provided, however, that the Executive Officer may, upon application from a motor vehicle manufacturer, approve other label locations that achieve the purpose of this paragraph.
 - (3) Such labels shall be in the English language in block letters which shall be of a color that contrasts with their background.
- ii. For purposes of this section a motor vehicle shall be deemed to be equipped with an emission control device which will be significantly impaired by the use of leaded gasoline if any alcohol fuel, unleaded gasoline, or a blend of these fuels was used in any testing or service accumulation relating to the emission certification of said motor vehicles or engines installed therein.

3.5 Smog Index Labels. A smog index label made of paper or plastic shall be securely affixed in a readily visible location *either on a side window to the rear of the driver or, if it cannot be so placed, to the windshield of the motor vehicle.* The smog index label shall include the smog index for the vehicle and information to inform purchasers of the significance of the smog index. This explanatory information *shall may* take the following form:



Note: The Smog Index (SI) indicates the relative level of pollutants emitted by the vehicle. The lower the SI, the lower the vehicle's emissions.

An alternative label may be used if shown to yield equivalent clarity and if approved in advance by the Executive Officer.

The following smog indices shall be apply to 1995 and subsequent model-year light-duty vehicles:

- (a) For passenger cars and light-duty trucks (0-3750 lbs. loaded vehicle weight)
 - i. Vehicles which certify to the following emission standards shall be assigned a smog index of 1.

<u>Exhaust Non-methane Hydrocarbons</u>	<u>0.25 g/mi at 50,000 miles</u>
<u>Exhaust Oxides of Nitrogen</u>	<u>0.4 g/mi at 50,000 miles</u>
<u>Exhaust Carbon Monoxide</u>	<u>3.4 g/mi at 50,000 miles</u>
<u>Evaporative Hydrocarbons</u>	
<u>Diurnal + Hot Soak</u>	<u>2.0 g/test at 50,000 miles</u>

ii. Vehicles which certify to the following emission standards shall be assigned a smog index of 0.70.

<u>Exhaust Non-methane Hydrocarbons</u>	<u>0.25 g/mi at 50,000 miles</u>
<u>Exhaust Oxides of Nitrogen</u>	<u>0.4 g/mi at 50,000 miles</u>
<u>Exhaust Carbon Monoxide</u>	<u>3.4 g/mi at 50,000 miles</u>
<u>Evaporative Hydrocarbons</u>	
<u>Diurnal + Hot Soak</u>	<u>2.0 g/test at 100,000 miles</u>
<u>Running Loss</u>	<u>0.05 g/mi at 100,000 miles</u>

iii. TLEVs which certify to the following evaporative emission standards shall be assigned a smog index of 0.89.

<u>Evaporative Hydrocarbons</u>	
<u>Diurnal + Hot Soak</u>	<u>2.0 g/test at 50,000 miles</u>

iv. TLEVs which certify to the following evaporative emission standards shall be assigned a smog index of 0.59.

<u>Evaporative Hydrocarbons</u>	
<u>Diurnal + Hot Soak</u>	<u>2.0 g/test at 100,000 miles</u>
<u>Running Loss</u>	<u>0.05 g/mi at 100,000 miles</u>

v. LEVs which certify to the following evaporative emission standards shall be assigned a smog index of 0.67.

<u>Evaporative Hydrocarbons</u>	
<u>Diurnal + Hot Soak</u>	<u>2.0 g/test at 50,000 miles</u>

vi. LEVs which certify to the following evaporative emission standards shall be assigned a smog index of 0.37.

<u>Evaporative Hydrocarbons</u>	
<u>Diurnal + Hot Soak</u>	<u>2.0 g/test at 100,000 miles</u>
<u>Running Loss</u>	<u>0.05 g/mi at 100,000 miles</u>

vii. ULEVs which certify to the following evaporative emission standards shall be assigned a smog index of 0.64.

<u>Evaporative Hydrocarbons</u>	
<u>Diurnal + Hot Soak</u>	<u>2.0 g/test at 50,000 miles</u>

viii. ULEVs which certify to the following evaporative emission standards shall be assigned a smog index of 0.34.

Evaporative Hydrocarbons

<u>Diurnal + Hot Soak</u>	<u>2.0 g/test at 100,000 miles</u>
<u>Running Loss</u>	<u>0.05 g/mi at 100,000 miles</u>

ix. ZEVs shall be assigned a smog index of 0.00.

(b) For light-duty trucks (3751-5750 lbs. loaded vehicle weight)

i. Vehicles which certify to the following emission standards shall be assigned a smog index of 1.

<u>Exhaust Non-methane Hydrocarbons</u>	<u>0.32 g/mi at 50,000 miles</u>
<u>Exhaust Oxides of Nitrogen</u>	<u>0.7 g/mi at 50,000 miles</u>
<u>Exhaust Carbon Monoxide</u>	<u>4.4 g/mi at 50,000 miles</u>
<u>Evaporative Hydrocarbons</u>	
<u>Diurnal + Hot Soak</u>	<u>2.0 g/test at 50,000 miles</u>

ii. Vehicles which certify to the following emission standards shall be assigned a smog index of 0.77.

<u>Exhaust Non-methane Hydrocarbons</u>	<u>0.32 g/mi at 50,000 miles</u>
<u>Exhaust Oxides of Nitrogen</u>	<u>0.7 g/mi at 50,000 miles</u>
<u>Exhaust Carbon Monoxide</u>	<u>4.4 g/mi at 50,000 miles</u>
<u>Evaporative Hydrocarbons</u>	
<u>Diurnal + Hot Soak</u>	<u>2.0 g/test at 100,000 miles</u>
<u>Running Loss</u>	<u>0.05 g/mi at 100,000 miles</u>

iii. TLEVs which certify to the following evaporative emission standards shall be assigned a smog index of 0.89.

Evaporative Hydrocarbons

<u>Diurnal + Hot Soak</u>	<u>2.0 g/test at 50,000 miles</u>
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- iv. TLEVs which certify to the following evaporative emission standards shall be assigned a smog index of 0.67.

Evaporative Hydrocarbons

Diurnal + Hot Soak

2.0 g/test at 100,000 miles

Running Loss

0.05 g/mi at 100,000 miles

- v. LEVs which certify to the following evaporative emission standards shall be assigned a smog index of 0.65.

Evaporative Hydrocarbons

Diurnal + Hot Soak

2.0 g/test at 50,000 miles

- vi. LEVs which certify to the following evaporative emission standards shall be assigned a smog index of 0.43.

Evaporative Hydrocarbons

Diurnal + Hot Soak

2.0 g/test at 100,000 miles

Running Loss

0.05 g/mi at 100,000 miles

- vii. ULEVs which certify to the following evaporative emission standard shall be assigned a smog index of 0.62.

Evaporative Hydrocarbons

Diurnal + Hot Soak

2.0 g/test at 50,000 miles

- viii. ULEVs which certify to the following evaporative emission standard shall be assigned a smog index of 0.39.

Evaporative Hydrocarbons

Diurnal + Hot Soak

2.0 g/test at 100,000 miles

Running Loss

0.05 g/mi at 100,000 miles

- ix. ZEVs shall be assigned a smog index of 0.00.

4. The provisions of these specifications shall not prevent a manufacturer from also reciting on the label that such vehicle or engine conforms to any applicable federal emission standards for new motor vehicles or new motor vehicle engines or any other information that such manufacturer deems necessary for, or useful to, the proper operation and satisfactory maintenance of the vehicle or engine.

5. As used in these specifications, readily visible to the average person shall mean that the label shall be readable from a distance of eighteen inches (46 centimeters) without any obstructions from vehicle or engine parts (including all manufacturer available optional equipment) except for flexible parts (e.g., vacuum hoses, ignition wires) that can be moved out of the way without disconnection. Alternatively, information required by these specifications to be printed on the label shall be no smaller than 8 point type size provided that no vehicle or engine parts, (including all manufacturer available optional equipment), except for flexible parts, obstruct the label. For the VEC and VIN labels, sufficient clearance shall be provided to use a non-contact bar-code scanner.
6. For the tune-up label and vacuum hose routing diagram label, the labels and any adhesives used shall be designed to withstand, for the vehicle's total expected life, typical vehicle environmental conditions in the area where the label is attached. Typical vehicle environmental conditions shall include, but are not limited to, exposure to engine lubricants and coolants (e.g., gasoline, motor oil, brake fluids, water, ethylene glycol), underhood temperatures, steam cleaning, and paints or paint solvents. The manufacturer shall submit, with its certification application, a statement attesting that its labels comply with this requirement.

VEC and VIN machine-readable labels shall meet the applicable functional test specifications contained in SAE standards J1892 (OCT 1993) and J1877 (JUL 1994).

7. The manufacturer shall obtain approval from the Executive Officer for all label formats and locations prior to use. Approval of the specific tune-up settings is not required; however, the format for all such settings and tolerances, if any, is subject to review. If the Executive Officer finds that the information on the label is vague or subject to misinterpretation, or that the location does not comply with these specifications, he or she may require that the label or its location be modified accordingly.
8. Samples of all actual production labels used within an engine family shall be submitted to the Executive Officer within thirty days after the start of production.
9. The Executive Officer may approve alternate label locations or may, upon request, waive or modify the label content requirements provided that the intent of these specifications is met.
10. If the Executive Officer finds any motor vehicle or motor vehicle engine manufacturer using labels which are different from those approved or which do not substantially comply with the readability or durability requirements set forth in these specifications, the Executive Officer may invoke Section 2109, Article 2, ~~Subchapter 2, Chapter 3,~~ Title 13, California Code of Regulations.

State of California
AIR RESOURCES BOARD

PROPOSED

**CALIFORNIA ASSEMBLY-LINE TEST PROCEDURES FOR 1983 1998
AND SUBSEQUENT MODEL-YEAR PASSENGER CARS,
LIGHT-DUTY TRUCKS AND MEDIUM-DUTY VEHICLES**

_____ Adopted: November 24, 1981
_____ Amended: March 9, 1983
_____ Amended: May 25, 1983
_____ Amended: August 21, 1984
_____ Amended: September 22, 1993

Adopted: _____

Note: The regulatory amendments proposed in this rulemaking are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions from the version of the test procedures as amended on September 22, 1993. Modifications to the originally noticed

text are designated by *bold italics* and ~~*bold*~~ *strikeout* to represent additions and deletions, respectively.

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CALIFORNIA ASSEMBLY-LINE TEST PROCEDURES FOR ~~1983~~ 1998
AND SUBSEQUENT MODEL-YEAR PASSENGER CARS,
LIGHT-DUTY TRUCKS AND MEDIUM-DUTY VEHICLES

A. GENERAL PROVISIONS

1. APPLICABILITY

~~These test procedures, adopted pursuant to Section 43210 of the California Health and Safety Code (H & SC), are applicable to vehicle manufacturers of 1983 and subsequent model-year liquefied petroleum gas, compressed or liquefied natural gas, methanol, hybrid electric, gasoline, and diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles, except motorcycles, including all Transitional Low-Emission Vehicles (TLEVs), Low-Emission Vehicles (LEVs), and Ultra-Low-Emission Vehicles (ULEVs), subject to registration and manufactured for sale in California; provided that these Test Procedures shall not apply to zero-emission vehicles or medium-duty vehicles certified in accordance to the optional standards and test procedures established in Title 13, CCR, section 1956.8.~~

These test procedures, adopted pursuant to Section 43210 of the California Health and Safety Code (H & SC), are applicable to all new 1998 and subsequent model-year passenger cars, light-duty trucks, and medium-duty vehicles subject to certification and manufactured for sale in California, except for zero-emission vehicles and medium-duty vehicles certified according to the optional standards and test procedures of section 1956.8, Title 13, California Code of Regulations (CCR).

2. COMPLIANCE

The procedures specify two types of tests: (1) an inspection test to be applied to every vehicle before sale; and (2) a quality-audit test according to the ~~"CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1981 AND SUBSEQUENT MODEL PASSENGER CARS, LIGHT-DUTY TRUCKS AND MEDIUM-DUTY VEHICLES"~~ or "CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1988 AND SUBSEQUENT MODEL PASSENGER CARS, LIGHT-DUTY TRUCKS AND MEDIUM-DUTY VEHICLES," as applicable for vehicles selected in accordance with paragraph C.1. of these procedures. Demonstration of compliance with cold temperature carbon monoxide standards shall be exempt from quality-audit testing. A vehicle is in compliance with these assembly-line standards and test procedures when that vehicle is in compliance with the inspection test requirements and that vehicle's engine family is in compliance with the quality-audit test requirements. Since quality-audit evaluations occur less frequently than the inspection tests, a vehicle ~~which~~ that passes the inspection test may be

presumed to be in compliance with the full assembly-line procedures pending meeting the quality-audit evaluation of that vehicle's engine family.

3. ACCESS

Air Resources Board (ARB) personnel and mobile laboratories shall have access to vehicle assembly plants, distribution facilities, and test facilities for the purpose of vehicle selection, testing, and observation. Scheduling of access shall be arranged with the designated manufacturer's representative and shall not unreasonably disturb normal operations.

4. VARIATIONS AND EXEMPTIONS

Variations from these procedures which produce substantially equivalent results may be authorized by the Executive Officer. In extraordinary circumstances where compliance with these procedures is not possible or practicable, a manufacturer may appeal to the Air Resources Board for a temporary exemption.

5. COMMUNICATIONS

All reports required by these procedures shall be sent to:

Chief, Mobile Source Division
California Air Resources Board
9528 Telstar Avenue
El Monte, CA 91731

~~Two copies of the report shall be submitted.~~

~~B. INSPECTION TEST PROCEDURES -- 1983 AND 1984 MODEL-YEAR VEHICLES~~

~~This inspection test shall be performed on all 1983 and 1984 model-year passenger cars, light-duty trucks and medium-duty vehicles subject to these test procedures.~~

~~1. INSPECTION TEST PROCEDURES~~

~~(a) Functional Test~~

~~Functional test of the engine components and control systems which affect emissions shall be made prior to the steady-state emissions tests. If a vehicle fails one or more functional tests, it must be repaired and pass a functional retest before it can be emissions tested.~~

~~— A list of the items to be functionally checked and a procedure for performing these checks shall be maintained by the manufacturer and may be requested for review at any time after production start-up by the chief, Mobile Source Division. When requested, the manufacturer has up to 30 days to submit a copy of these procedures. Within 60 days of receipt, the Chief, Mobile Source Division, may require revisions.~~

~~— (b) Steady-State Emissions Test~~

~~— The vehicle engine shall be adjusted to the manufacturer's specifications for delivery to the customer prior to the steady-state emissions test. This test shall consist of a determination of hydrocarbon (HC) and carbon monoxide (CO) exhaust concentrations with the engine operating in a normal idle condition. All tests, including those of control limit test vehicles, shall be conducted as follows:~~

~~— (1) Vehicles shall be tested in the normal "warmed-up" operating temperature range, i.e., after the choke is fully open and the engine is at curb idle speed, but before thermal override devices are actuated to prevent overheating. The test may be performed in any transmission gear, however the same gear shall be used for control limit test vehicles and production vehicles. For each engine family, the idle test may be performed without the air injection system (AIR) instead of with AIR, provided that the control limit vehicles are tested both with and without AIR. The requirements of section B (3)(g) must be met with AIR. The control limit test vehicles and all production vehicles should be warmed-up and tested in the same manner.~~

~~— (2) The sampling probes of the analytical system shall be inserted into the exhaust outlets far enough to avoid dilution with the outside air. When this is not possible, a tailpipe extension shall be used.~~

~~— (3) A vehicle which fails a steady-state emissions test shall be retested or repaired and shall pass on retest prior to sale.~~

~~— 2. EVALUATION~~

~~— Any vehicle tested by the steady-state emissions test showing emissions less than the control limits established for its engine family or subgroup and which had previously passed the functional tests will be considered to be in compliance with the inspection test requirements.~~

~~— 3. CONTROL LIMITS~~

~~— The control limits for each engine family or subgroup at the start of a model year will be determined as follows:~~

~~_____ (a) Measure the emissions from the first 100 vehicles of each engine family or subgroup tested by the steady-state assembly-line inspection test.~~

~~_____ (b) Determine the mean emission level and standard deviation for each pollutant (HC and CO).~~

~~_____ (c) The control limit for each pollutant is the sum of the mean plus two times the standard deviation for that pollutant.~~

~~_____ (d) Until the first control limits are established, the manufacturer shall use temporary control limits based on the first ten tests. These ten vehicles are deemed to meet the control limits so established.~~

~~_____ (e) (i) For control systems that do not use catalytic converters -- If the HC control limit value is determined in subparagraph (c) is less than 100 ppm, the HC control value may be increased by up to 50 ppm, not to exceed 100 ppm. If the CO control limit determined in subparagraph (c) is less than 1.0 percent, the CO control limit may be increased by up to 0.5 percent, not to exceed 1.0 percent.~~

~~_____ (ii) For control systems that use catalytic converters -- If the HC control limit value determined in subparagraph (c) is less than 50 ppm, the control limit value may be increased by up to 30 ppm, not to exceed 50 ppm.~~

~~_____ If the CO control limit determined in subparagraph (c) is less than 0.5 percent, the CO control limit may be increased by up to 0.3 percent, not to exceed 0.5 percent.~~

~~_____ (f) Idle control limit values may be rounded to the nearest 10 ppm HC and 0.1 percent CO in conformance to ASTM E29-67, except where this would result in a zero value.~~

~~_____ (g) The maximum allowable steady-state control limits for HC and CO are those values used as the idle mode standard shown in Title 13, California Administrative Code (C.A.C.) Section 2176 for the applicable model-year or, where applicable model-year standards are not yet adopted, the latest previous model-year values in effect at the time the vehicle is manufactured. An exemption to this requirement will be granted providing the manufacturer submits emission data with each quarterly report listed in one of the following options:~~

~~_____ (1) Submit with each quarterly assembly-line report HC and CO emission values measured at engine idle speed for each quality audit vehicle tested and the computed mean and standard deviation of HC and CO emission results for the total number of vehicles tested, by engine family. Measurements of HC and CO shall be conducted immediately following completion of the dynamometer run and vehicles shall be in a state described~~

~~under B.1 (b)(1) above. If less than 30 vehicles were quality-audit tested during the reporting quarter, the computation of the means and standard deviations are not required.~~

~~(2) Submit quarterly HC and CO emission values measured at engine idle speed for a minimum of 30 vehicles in the engine family or sub-group immediately after these vehicles have complied with the assembly-line inspection procedures and have either been run-in a distance of 50 miles (on the road or dynamometer) or after other appropriate engine break-in has been performed and the engine is operating at a fully warmed-up condition as described in b.1 (b)(1) above. In addition to emission results of individual vehicles, the mean and standard deviation shall be computed and submitted.~~

~~(3) The manufacturer may propose other methods to achieve results equivalent to the two operations above. These emission data shall be obtained from stabilized vehicles which have emission control systems with no defects and are properly adjusted to manufacturer's specifications.~~

~~(h) Control limits with AIR operating shall be calculated and reported for information purposes for those engine families that are tested without AIR in operation.~~

~~Control limit values shall be recalculated for each production quarter based on the measured emissions from at least 100 vehicles produced during the last half of the preceding quarter of production for each engine family or subgroup tested by the steady-state emissions test. When production levels do not permit compliance with the above, data from vehicles produced during the first half of the preceding quarter may be used. If the quarterly production of any engine family is less than 100 vehicles, the manufacturer shall use the test results from all vehicles produced during that quarter in determining the control limit values for the next quarter.~~

~~The Executive officer shall be notified within one week if control limit values are recalculated following running changes which affect idle emissions levels. The new control limit values and the date they first went into effect shall be part of the notification.~~

~~All testing, reports, evaluations, etc., shall be by engine family except when the Executive Officer has approved a breakdown by subgroups (e.g., different carburetors, engine displacements, control systems, transmissions, and inertia weights), by assembly plant, or both.~~

Note:

~~Data from any vehicle indicating gross engine malfunction, and/or failure or disconnection of any emission control component, shall be excluded from that used for generating control~~

~~limits. Retest data on vehicles exceeding the control limits shall not be used in determining control limits for subsequent quarters.~~

~~4. REPORTS~~

~~Reports shall be submitted to the Air Resources Board within 45 calendar days of the end of each calendar quarter and within 45 calendar days of the end of the manufacturer's model production year. Results for two different model years shall not be combined statistically.~~

~~The report shall include:~~

~~(a) The temporary quarterly control limit values obtained for the first quarter of production.~~

~~(b) The mean and standard deviation of the steady-state emissions test used to determine the quarterly control limits.~~

~~(c) The steady-state control limit values for the next quarter's production.~~

~~(d) From a representative sample of vehicles approved by the Executive Officer, the number and percentage of vehicles:~~

~~(1) failing the test~~

~~(2) repaired or adjusted~~

~~All HC values should be stated as hexane equivalents for NDIR measurement and ppm carbon if a flame ionization detector is used. The hexane equivalent conversion value shall be supplied for each different model of flame ionization detector used and for each engine family.~~

~~CB. INSPECTION TEST PROCEDURES --1985 AND SUBSEQUENT MODEL-YEAR VEHICLES~~

~~This inspection test shall be performed on all 1985 1998 and subsequent model-year passenger cars, light-duty trucks and medium-duty vehicles subject to these assembly-line test procedures. However, for 1985 model-year vehicles only, the inspection test procedures set forth in Section B. of these test procedures may be performed in lieu of the inspection test procedures set forth in this Section C. In such a case, a manufacturer may change to the procedures set forth in this Section C. at the start of any calendar quarter in which the manufacturer starts performing the inspection test set forth in this Section C.~~

1. INSPECTION TEST PROCEDURES

This inspection test is a Ffunctional tests of the emission control components and systems used on the vehicle and shall be conducted in accordance with a plan approved by the Executive Officer. At least 90 days prior to the start of production, the manufacturer shall submit to the Executive Officer a plan for functional testing which lists the emission control components and systems to be tested and specifies the testing procedures to be used. This plan shall include, but not be limited to, the list of components and systems contained in Appendix B, which sets forth typical types of components and systems for inclusion in the functional test plan. If an on-board emission control diagnostic system of any type, either completely self-contained or requiring external peripheral equipment, is installed on a vehicle, it must be included in the components to be functionally tested and the on-board diagnostic system must be used to the fullest extent practical in functionally testing the vehicle emission control system. In appropriate instances, functional tests may be conducted during the vehicle assembly process before the end of the assembly line. For components which that cannot practically be functionally checked on every vehicle, a statistically valid sampling test may be used as the functional tests. The Executive Officer shall approve the plan unless he or she determines that the tests are not designated for the appropriate control components and systems or that the tests will be inadequate to reasonably assure that the components and systems are correctly installed and are functioning properly. Approval of the test plan applies to subsequent model years until changes are made to the emission control components or systems being used, or to the approved test plan. The manufacturer may at any time submit proposed changes to the plan for functional testing. Once a plan is approved, for subsequent model-years, a manufacturer must submit a plan only if changes are made to the emission control components or systems on the vehicle, or to the proposed functional test. In the case of such changes, only the portion of the plan covering the changed components or systems, or changes in tests, must be submitted for approval. An update to an approved plan or resubmittal of a new plan is required when changes are made to the emission control components or systems necessitating a change in the functional tests, or changes are proposed to the test plan. In order for a vehicle to satisfy the inspection test requirements, each of the emission control components and systems identified in the approved plan for testing must be found, pursuant to the specified approved test, to be correctly installed and functioning properly.

2. EVALUATION

Any Only vehicles which that passes every test sequence in the approved functional test plan will be considered to be in compliance with the inspection test requirements. In order for a vehicle to satisfy the inspection test requirements, each of the emission control components and systems identified in the approved plan for testing must be correctly installed and functioning properly pursuant to the specified approved test.

3. REPORTING

Each manufacturer shall submit quarterly a statement that the functional tests included in the approved test plan have been conducted on all vehicles produced for sale in California. The statement shall be signed by an official of the manufacturer who has verified the accuracy of the statement and shall accompany the assembly-line quality quarterly audit test report for each production quarter.

DC. QUALITY-AUDIT TEST PROCEDURES

1. VEHICLE SAMPLE SELECTION

The vehicle manufacturer shall randomly select vehicles from each engine family for quality-audit testing. Each ~~selected~~ selected vehicle ~~selected~~ for quality-audit testing must pass the inspection test, be equipped with emission control systems certified by the ARB, and be representative of the ~~manufacturer's California sales vehicles certified for sale in California.~~ The procedure for randomly selecting vehicles must be submitted to the Chief, Mobile Source Division, El Monte, California and an approved plan must be on file with the ARB prior to production.

A continuous random sample rate shall be chosen by the manufacturer to provide a sample which is representative of the total engine family production. The manufacturer shall select a sample rate which he or she determines will be satisfactory for use by the ARB in determining the number of vehicles in the entire population of a particular engine family which do not meet Board-established emission standards by extrapolation from the percentage of the sample not meeting the standards. The results from the sample may be extrapolated to the entire population subject to the provisions relating to vehicle exclusion contained in paragraph C.3 ~~which follows.~~ The sample rate so chosen shall not be less than 2.0 percent except for fuel-flexible and dual-fuel vehicles where the sample rate chosen shall not be less than 1.0 percent. A vehicle manufacturer may use, as an alternate to the above vehicle selection procedure, the optional procedure outlined in Appendix A. The manufacturer shall notify the Executive Officer of any change to the sample rate and the date of implementation of such change in the quarterly audit test report. ~~The date of such change shall be reported in accordance with paragraph 6 which follows.~~

~~A vehicle manufacturer may use, as an alternate to the above vehicle selection procedure, the optional procedure outlined in Appendix A.~~

Four-wheel drive vehicles ~~which~~ that can be manually shifted to a two-wheel drive mode will be tested in the normal on-highway two-wheel drive mode of operation. If full-time four-wheel drive vehicles are selected, substitutions may be made with comparable two-wheel drive vehicles of the same engine family. If comparable two-wheel drive vehicles are not available, selected full-time four-wheel drive vehicles will be tested on a four-wheel drive.

dynamometer, or alternatively, on a two-wheel drive dynamometer, by having after the front wheels temporarily disengaged or the front end of the vehicle elevated.

The Executive Officer may, upon notice to the manufacturer, require the sample rate to be increased to a maximum of ten percent of production (not to exceed 30 additional vehicles) of the calendar quarterly production of any engine family by invoking CCR, Title 13, Section 2110 Chapter 3, Title 13 of the C.A.C.

2. VEHICLE PREPARATION AND PRECONDITIONING

(a) After the inspection tests, no emissions tests may be performed on a quality-audit vehicle prior to the first quality-audit test, except where such tests are run on all vehicles manufactured certified for sale in California.

(b) The vehicle shall begin the test sequence as received from the inspection test, except for mileage accumulation or engine run-in. The schedule for mileage accumulation or engine run-in and any changes to the schedule for an engine family must be submitted to the Executive Officer with each quarterly audit test report. This schedule must be adhered to for all vehicles quality-audit testing tested within an engine family and subgroup or engine family and at all assembly plants as appropriate. An acceptable plan for accelerated mileage accumulation/engine break-in schedules (high engine rpm for an extended period of time or other abnormal driving conditions) and special preparation (e.g., disabling the traction control) for an engine family or subgroup must be submitted to the Executive Officer for approval prior to the planned implementation. The plan will be deemed acceptable if the manufacturer demonstrates that the plan does not alter the emission control effectiveness of a vehicle under conditions that may reasonably be expected to be encountered in normal operation and use.

(c)(1) For vehicles which are certified to the running loss and useful life standards for evaporative emissions contained in Title 13, California Code of Regulations CCR, Section 1976(b)(1), and the incorporated "California Evaporative Emissions Standards and Test Procedures for 1978 and Subsequent Model Motor Vehicles," as last amended November 20, 1991, the vehicle preparation and preconditioning procedure shall be conducted in accordance with the evaporative emissions test procedures contained in section 4.g.i., "Test Procedure, General Requirements," subsections A.-F., as codified in subsections 4.g.ii.(c), 4.g.ii.(d), and 4.g.iii., with the exception that: (1) the cold soak prior to the preconditioning, and the fuel drain and fuel fill following the vehicle preconditioning, as described in subsections 4.g.i.B. and 4.g.i.C., respectively, may be omitted at the discretion of the manufacturer and (2) the vehicle canister loading procedure contained in subsection 4.g.iii. shall be conducted using one of the following options:

(i) The vehicle canister loading procedure shall be conducted in accordance with subsections 4.g.iii.C. and 4.g.iii.D., except that prior to the canister loading, the canister shall be cycled no less than 2 times ~~using the method specified in subsection 4.c.iii~~, utilizing the fuel used in normal operation (bench test procedures), or utilizing a 50/50 mixture by volume of butane and nitrogen in order to place a heel on the canister. Alternative methods of loading the original canister may be used, provided such a method is approved in advance by the Executive Officer on the basis of achieving canister loading comparable to the prescribed method.

OR

(ii) The vehicle canister loading procedure described in subsections 4.g.iii.C. and 4.g.iii.D. shall be employed for a canister which is loaded separate from the vehicle, and then attached prior to the exhaust tests, with the original canister disabled. Such a canister loaded separate from the vehicle shall be identical in nominal working bed capacity, charcoal bed volume and configuration to the original canister present on the vehicle. The loading procedure for this canister shall be as described in subsections 4.g.iii.C. and 4.g.iii.D., except for the following: (1) the rate of butane loading shall not exceed 40 grams/hour, and (2) prior to the loading, the canister shall be cycled at least 2 times ~~according to the method specified in subsection 4.c.iii~~ utilizing the fuel used in normal operation (bench test procedure), or utilizing a 50/50 mixture by volume of butane and nitrogen. If the canister has been cycled for use in a previous exhaust test, this step may be omitted. An alternative to this option (ii) may be used provided such a method is approved in advance by the Executive Officer on the basis of whether the flow of vapor from the canister to the engine is comparable to the prescribed method.

OR

(iii) Data shall be submitted to the Executive Officer demonstrating the difference or lack of difference in exhaust emissions, for hydrocarbons, OMNMFCE and carbon monoxide, between vehicles possessing a canister(s) loaded in accordance with subsections 4.g.iii.C. and 4.g.iii.D. and cycled no less than 2 times ~~according to the method specified in subsection 4.c.iii~~ utilizing the fuel used in normal operation (bench test procedure) or utilizing a 50/50 mixture by volume of butane and nitrogen, and vehicles possessing an unloaded canister(s). For the purposes of this section, the preparation and preconditioning of vehicles with an unloaded canister shall be conducted in an identical manner as described in 2.(c)(1) of this procedure for vehicles equipped

with a loaded canister, except that canister loading requirements contained in subsections 4.g.iii.C. and 4.g.iii.D. shall be omitted.

OR

(iv) As an alternative to loading the on-board canister in option (iii), a surrogate canister may be used as in option (ii); however, the surrogate canister may not be used more than once, and the loading procedure shall be as specified in section 4.g.iii.C. and 4.g.iii.D. except that prior to the canister loading, each canister shall be cycled no less than two times utilizing the fuel used in normal operation, or utilizing a 50/50 mixture by volume of butane and nitrogen, in order to place a heel on each canister.

A test plan for generation of such the data requested in option (iii) and (iv) shall be submitted to the Executive Officer for approval prior to testing. Such testing shall involve a minimum of ten (10) vehicles for each engine family chosen to use this option (iii) or (iv), tested both with loaded and unloaded canisters. This testing shall be conducted during the first calendar quarter of production for a given model-year in order to properly apply the results to each quality-audit vehicle which is tested. Such testing shall establish a measured exhaust emissions difference for each vehicle, for hydrocarbons, OMNMFCE, and carbon monoxide. For each pollutant these differences shall be averaged to generate average exhaust emissions differences (referred to below as "D"). These differences shall be applied, as an additive factor, to the applicable exhaust emissions results of each quality-audit vehicle that is not tested with a canister loaded in accordance with 2.(c)(1)(i) or 2.(c)(1)(ii). Compliance with the applicable exhaust emission standards shall be based on the sum of D and the measured quality-audit emission data for each vehicle. However, in no case shall this additive factor be applied when its value is less than zero.

~~(c)(2) For all other vehicles, the following procedure shall apply. A new carbon canister may be installed on the vehicle at the start of the test sequence. The test sequence shall consist of one Urban Dynamometer Driving Schedule (UDDS) test procedure, followed by a cold soak and constant volume sample (CVS) test. The federal test procedure requirement, consisting of heating the fuel before the CVS test, is to be omitted. The manufacturer may request permission to use an alternate preconditioning procedure provided the manufacturer demonstrates that it will not affect the loading of the carbon canister when compared with the Urban Dynamometer Driving Schedule (UDDS).~~

(d) Except as provided in paragraph ~~D.2.(f)~~ C.2.(e) below, no vehicle selected for quality-audit testing shall be repaired or adjusted after passing the inspection test, except for a vehicle that: (1) is not testable, e.g., cannot be started,

transmission or brakes lock-up; (2) is not reasonably operative, e.g., some transmission gears not functioning; (3) is unsafe to test; or (4) would be damaged by testing. All adjustments, preparations or repairs performed on vehicles prior to each test shall be reported to the Executive Officer by inclusion in the quarterly audit test report. The vehicle condition, symptoms and reason(s) for each repair or adjustment shall be listed. A fault condition indicated by a fault code in the memory of the on-board computer may be repaired according to manufacturer's published service procedures and shall be reported as noted before.

~~(c) If a vehicle is shipped to a remote facility for quality-audit testing, correction of damage or maladjustment, which is found to have resulted from shipment of the vehicle, is permitted only after the initial test of the vehicle, except as provided in paragraph (d) above.~~

~~All adjustments or repairs performed on vehicles prior to each test shall be reported to the Executive Officer by inclusion in the quarterly report. The vehicle condition and symptoms and reason(s) for each repair or adjustment shall be listed. In the event a retest is performed, application may be made to the Executive Officer for permission to substitute the after-repair test results for the original test results. The Executive Officer will either affirm or deny the application. When requested by the manufacturer, no more than ten days after the production quarter, response from the Executive Officer will be within ten working days.~~

~~(f) If a vehicle is shipped to a remote facility for quality-audit testing, no pre-delivery type inspection, adjustment, or repair of vehicles selected for quality-audit is allowed, except as follows: if subsequent to shipping from the assembly-line, the manufacturer performs the particular inspection and correction of damage or maladjustment at designated preparation facility locations for all vehicles produced and the manufacturer's written inspection instructions are approved by the Executive Officer, then these specific inspections and corrections will be allowed prior to testing quality-audit vehicles.~~

~~(g) If the emission test results of a vehicle are determined to be invalid by the manufacturer, the vehicle must be retested. Emission results from all tests shall be reported. A detailed report on the reasons for each invalid test shall be included in the quarterly report.~~

(e) If a vehicle is shipped to a remote facility for quality-audit testing, no pre-delivery type inspection, adjustment, or repair of vehicles selected for quality-audit is allowed, except as provided in C.2.(d) and as follows: if, subsequent to shipping from the assembly-line, the manufacturer performs the particular inspection and correction of damage or maladjustment at designated preparation facility locations for

all vehicles produced, and the manufacturer's written inspection instructions are approved by the Executive Officer, then these specific inspections and corrections will be allowed prior to testing quality-audit vehicles.

(f) If a test is aborted, or the emission test results of a vehicle are determined to be invalid by the manufacturer, the vehicle must be retested. Emission results from all tests shall be reported. A report on the reasons for each invalid test shall be included in the quarterly audit test report.

(g) Testing may be aborted if the MIL illuminates and, before retesting, the manufacturer may perform any repairs necessary to extinguish the MIL using the manufacturer's published service procedures. All repairs must be reported in the quarterly audit test report.

(h) In the event a retest is performed after an initial valid test, application may be made to the Executive Officer for permission to substitute the retest results for the initial valid test results. The Executive Officer will either approve or deny the application. When requested by the manufacturer, no more than ten days after the production quarter, the response from the Executive Officer shall be within ten working days.

3. STANDARDS AND TEST PROCEDURES

The emission standards and the exhaust sampling analytical procedures shall be those described in the "~~CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1981 AND SUBSEQUENT MODEL PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES~~" or "CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1988 AND SUBSEQUENT MODEL PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES", as applicable, for vehicles tested for exhaust emissions only, with exceptions or additions as shown in paragraph DC.2.

4. EVALUATION

The evaluation shall be performed on sample sizes containing 30 or more vehicles. ~~If a sample size for a particular production quarter is less than 30 vehicles, the data from that quarter shall be combined with all the data from each successive quarter until data from at least 30 vehicles have been quality-audit tested is included in the quarterly evaluation.~~ Each vehicle manufacturer shall review the test results of the first 30 test vehicles of each engine family for each calendar quarter of production. Once 30 vehicles have been tested and evaluated in a quarter(s), the manufacturer must conduct evaluations at the end of each month for the rest of the quarter. If a sample size for a particular production quarter is less than 30 vehicles, the

data from that quarter shall be combined with all the data from the previous each successive quarter until data from at least 30 vehicles have been quality-audit tested is are included in the quarterly evaluation. If the sample size for the last final quarter's production for a model year does not contain at least 30 vehicles, the data from the last final quarter shall be combined with all the data from each preceding quarter until the sample size contains at least 30 vehicles. For an engine family which contains both light-duty trucks and medium-duty vehicles, all references in this test procedure to engine family shall mean light-duty truck subgroup or medium-duty vehicle subgroup. All subgroups in an engine family (e.g., two- and four-wheel drive vehicles) shall be included in the emissions evaluation of the engine family.

~~Based upon additional information submitted by a manufacturer, the Executive Officer may allow rejection of any data from vehicles if they are considered to be not representative of production.~~ *Based upon additional information submitted by a manufacturer, the Executive Officer may allow rejection of any data from vehicles if they are considered to be not representative of production.*

~~For each production quarter, if 30 or more vehicles are tested, If the sample size is 30 or more vehicles, the Chief, Mobile Source Division, shall be notified in writing within ten working days whenever an engine family exceeds an emission standard. the ARB shall consider that p Probable cause exists for finding a violation by any engine family if the average emissions of any pollutant, after multiplying the emission data of each vehicle by applying the appropriate certification deterioration factor (DF) to the emission data of each vehicle, exceeds the applicable year exhaust emission standards, when rounded to the same number of significant digits as the standard.~~

The Executive Officer may invoke Section 2109, ~~Chapter 3~~, Title 13 of the CCR, if probable cause is found for a full or combined production quarter. The Executive Officer may invoke Section 2110, ~~Chapter 3~~ Title 13 of the CCR, if probable cause is found for a short start-up production period (less than a full calendar quarter), for the first 30 vehicles quality-audit tested during any production quarter or from the start of production, or for vehicles evaluated in accordance with the monthly evaluation required ~~above by paragraph 6 below~~. In addition, the ARB may seek statutory penalties pursuant to H & SC Sections 43211 and 43212 at the end of each full or combined calendar quarter of production. If the Executive Officer invokes CCR Section 2109 or 2110, an evaluation will be made on vehicles produced subsequent to the invocation of a plan adopted pursuant to Section 2109 or 2110 as long as the sample size contains at least 30 vehicles.

A manufacturer shall submit the following information within 30 days iff more than 1.0 percent (at least 2 vehicles) of the sample within an engine family has (a) projected emissions which exceed the applicable standards by more than 2.33 standard deviations at the time of any evaluation of that family's average emissions; within 30 working days, the manufacturer shall submit: (b) undeteriorated emissions which exceed the applicable emission standards by more

than 1.5 times and the MIL does not illuminate; or (c) the MIL illuminates during vehicle break-in, preconditioning or testing for the malfunction of a specific component or system:

- (a1) an analysis of the projected average emissions for each engine code/transmission type/inertia weight combination within that family;
- (b2) an engineering evaluation of the cause of failure for each vehicle;
- (c3) the manufacturer's opinion as to the nature of the problem; and
- (d4) any corrective action proposed by the manufacturer.

The Executive Officer shall review the report, and may require that the proposed corrective action be taken. If, after review of the report, the Executive Officer finds the proposed corrective action inadequate, the Executive Officer may invoke Section 2109 or 2110, as appropriate.

5. HYDROCARBON (HC) MEASUREMENTS

- (a) For an engine family certified to non-methane hydrocarbon (NMHC) standards, the manufacturer shall measure the NMHC content *which shall be multiplied by and apply the NMHC DF to the result.*
- (b) For an engine family certified to total hydrocarbon (THC) standards, the measured THC values shall be multiplied by the THC DF.
- (c) For an engine family certified to ~~organic material hydrocarbon equivalent (OMHCE)~~ or organic material non-methane hydrocarbon equivalent (OMNMHCE) standards, the manufacturer shall measure the ~~OMHCE~~ or OMNMHCE content which shall be multiplied by the ~~OMHCE~~ or OMNMHCE DF. As an alternative to measuring the ~~OMHCE~~ or OMNMHCE content, the Executive Officer may approve, upon submission of supporting data by a manufacturer, the use of ~~OMHCE~~ or OMNMHCE to NMHC ratios. To request the use of ~~OMHCE~~ or OMNMHCE to NMHC ratios, the manufacturer shall establish during certification testing the ratio of measured ~~OMHCE~~ or OMNMHCE exhaust emissions to measured NMHC exhaust emissions for each certification test data vehicle for the applicable engine family. The average of the individual test ratios of measured ~~OMHCE~~ or OMNMHCE to NMHC emissions for the engine family shall be submitted to the Executive Officer in the application for certification. Following approval of the application for certification, the manufacturer may conduct quality-audit testing on the engine family by measuring NMHC exhaust emissions rather than ~~OMHCE~~ or OMNMHCE exhaust emissions. The measured NMHC exhaust emissions shall be multiplied by the ~~OMHCE~~ or OMNMHCE to NMHC ratio submitted in the application for certification for the engine family to determine the equivalent ~~OMHCE~~ or OMNMHCE exhaust emission values for the quality audit test vehicle. The equivalent

~~OMHCE~~ or OMNMHCE exhaust emission values shall be compared to the ~~OMHCE~~ or OMNMHCE exhaust emission standard applicable to the engine family.

(d) For an engine family certified to non-methane organic gas (NMOG) standards, the manufacturer shall measure the NMOG content which shall have be multiplied by the NMOG DF and the reactivity adjustment factor and ozone DF applied, if applicable. As an alternative to measuring the NMOG content, the Executive Officer may approve, upon submission of supporting data by a manufacturer, the use of NMOG to NMHC ratios. To request the use of NMOG to NMHC ratios, the manufacturer shall establish during certification testing the ratio of measured NMOG exhaust emissions to measured NMHC exhaust emissions for each certification test data vehicle for the applicable engine family. The average of the individual test ratios of measured NMOG to NMHC emissions for the engine family shall be submitted to the Executive Officer in the application for certification. Following approval of the application for certification, the manufacturer may conduct quality-audit testing on the engine family by measuring NMHC exhaust emissions rather than NMOG exhaust emissions. The measured NMHC exhaust emissions shall be multiplied by the NMOG to NMHC ratio submitted in the application for certification for the engine family to determine the equivalent NMOG exhaust emission values for the quality audit test vehicle. The equivalent NMOG exhaust emission value shall be used in place of the measured NMOG exhaust emission value in determining the reactivity adjusted exhaust NMOG results. The equivalent reactivity adjusted NMOG exhaust emission values shall be compared to the NMOG exhaust emission standard applicable to the vehicle emission category (TLEV, LEV, or ULEV or SLEV) in which the engine family was certified.

(e) For fuel-flexible vehicles certified to either organic material non-methane hydrocarbon equivalent (OMNMHCE) or non-methane organic gas (NMOG) standards, the manufacturer may request from the Executive Officer the use of a methanol (M85) or ethanol (E85) exhaust emission to gasoline NMHC exhaust emission ratio which shall be established during certification testing for each certification test data vehicle for the applicable engine family. The average of the individual test ratios of measured M85 NMOG to gasoline NMHC emissions for the engine family shall be submitted to the Executive Officer in the application for certification. Following approval of the application for certification, the manufacturer may conduct quality- audit testing on the engine family by measuring gasoline NMHC exhaust emissions rather than M85 NMOG exhaust emissions. The measured gasoline NMHC exhaust emissions shall be multiplied by the M85 NMOG to gasoline NMHC ratio submitted in the application for certification for the engine family to determine the equivalent NMOG exhaust emission values for the quality audit test vehicle. The equivalent NMOG exhaust emission value shall be used in place of the measured NMOG exhaust emission value in determining the reactivity adjusted exhaust NMOG

results. The equivalent reactivity adjusted NMOG exhaust emission values shall be compared to the NMOG exhaust emission standard applicable to the vehicle emission category (TLEV, LEV, or ULEV, or SLEV) in which the engine family was certified. Manufacturers which choose this option shall test the full two percent of the vehicles selected for quality-audit testing.

(f) ~~For 1993 and 1994 model-year vehicles, the manufacturer has the option of using the fuel meeting the specifications set forth in Section 9.a(1), 9.a(1)(i), or 9.a(1)(ii) of the California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles for purposes of quality-audit testing. All 1995 1998 and subsequent conventional and low-emission vehicles which that certify with fuel meeting the specifications set forth in Section 9.a(1) of the California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles must use that fuel for purposes of quality audit testing. All 1995 1998 and subsequent conventional and low-emission vehicles which that certify with fuel meeting the specifications set forth in Section 9.a(1)(ii) of the California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles must use that fuel for purposes of quality audit testing.~~

6. FORMALDEHYDE (HCHO) MEASUREMENTS

For an engine family certified to HCHO standards, the manufacturer shall measure the HCHO content which shall be multiplied by the HCHO DF. As an alternative to measuring the HCHO content, the Executive Officer may approve, upon submission of supporting data by a manufacturer, the use of HCHO to NMHC ratios. To request the use of HCHO to NMHC ratios, the manufacturer shall establish during certification testing the ratio of measured HCHO exhaust emissions to measured NMHC exhaust emissions for each certification test data vehicle for the applicable engine family. The average of the individual test ratios of measured HCHO to NMHC emissions for the engine family shall be submitted to the Executive Officer in the application for certification. Following approval of the application for certification, the manufacturer may conduct quality-audit testing on the engine family by measuring NMHC exhaust emissions rather than HCHO exhaust emissions. The measured NMHC exhaust emissions shall be multiplied by the HCHO to NMHC ratio submitted in the application for certification for the engine family to determine the equivalent HCHO exhaust emission values for the quality audit test vehicle. The equivalent HCHO exhaust emission values shall be compared to the HCHO exhaust emission standard applicable to the engine family.

7. REPORTS

Each vehicle manufacturer shall submit a quality audit test report to the ARB within 45 calendar days after the end of each calendar quarter and 45 calendar days after the end of the production year. More frequent reports may be required if the Executive Officer invokes Title 13 CCR Section 2109 or 2110, Chapter 3, Title 13. ~~Each vehicle manufacturer shall review the test results of the first 30 test vehicles of each engine family for each calendar quarter of production or from the start of production, and the quarter's cumulative test results of each engine family at the end of each month. If the sample size is 30 or more vehicles, the Chief, Mobile Source Division, shall be notified in writing within ten working days whenever an engine family exceeds an emission standard.~~

The quarterly quality audit test report shall include the following:

~~(a) The total production and sample size for each engine family, and the total number of vehicles certified to TLEV, LEV, ULEV or zero-emission vehicle (ZEV) standards and produced and delivered for sale in California in each of the following vehicle classifications: 1) passenger cars and light-duty trucks 0-3750 lbs. loaded vehicle weight, 2) light-duty trucks 3751-5750 lbs. loaded vehicle weight, and 3) medium-duty vehicles.~~

(a) A description of the engine family that includes the total engine family quarterly production of vehicles produced and delivered for sale in California for the quarter, the vehicle class, the standards to which the engine family is certified, the production start date, the sampling option being used (2%, alternate or other) and, for the final quarter, the final production date.

(b) A description of each test vehicle (i.e., date of test, engine family, engine size, vehicle identification number, fuel system (e.g., number of venturi, fuel injection, etc.); transmission type, test weight used, dynamometer power absorber setting in horsepower, engine code or calibration number, build date or month, and test location).

(c) The CVS exhaust emission data and carbon dioxide emission data for each test vehicle. For methanol vehicles not certified as TLEVs, LEVs, or ULEVs, ~~OMHCE~~ or OMNMHCE data shall be substituted for NMHC or THC data, and formaldehyde (HCHO) data shall also be submitted. For vehicles certified as TLEVs, LEVs, or ULEVs, NMOG data shall be substituted for NMHC or THC data, and HCHO data shall also be submitted. If the MIL illuminates during the test, the fault code must be reported.

The data reported shall be rounded to one significant figure beyond the number of significant figures in the applicable standard. DF's (for 50,000, 100,000 or 120,000 miles), canister loading factors, conversion ratios (OMNMHCE to NMHC, NMOG to

~~NMHC, M85 to gasoline NMHC, HCHO to NMHC~~ shall be stated, then applied to the data. ~~The data reported~~ After the DF's are applied, ~~the data shall be reported and~~ shall be rounded using the rounding off method specified in ASTM E29-67 to the number of places to the right of the decimal point indicated below, in accordance with the emission standards to which the vehicle was certified:

THC, NMHC, or OMNMHCE	NMOG	CO	NO _x	HCHO	CO ₂	PM ₁₀
.XXX	.XXXX	.XX	.XX or .XXX	.XXXX	.X	.XXX

(d) The retest emissions data, as described in paragraph ~~Z~~(c) above, for any vehicle failing the initial test, and description of the corrective measures taken, including specific components replaced or adjusted.

(e) A statistical analysis of the quality-audit test results for each engine family stating:

(1) Number of vehicles tested.

(2) Average emissions and standard deviations of the sample for HC, NMHC, ~~or OMHCE~~ or OMNMHCE or NMOG, as applicable, CO, NO_x, PM₁₀ and HCHO, as applicable, both before and after applying DF's, reactivity adjustment factors, and ozone DF's, as applicable. In the latter case, the individual test points results shall be multiplied by or added to the DF's (for 50K, 100K or 120K, where applicable), reactivity adjustment factors, canister loading factors, conversion ratios (OMNMHCE to NMHC, NMOG to NMHC, M85 to gasoline NMHC, or HCHO to NMHC) and ozone DF's, as applicable, prior to computing the average and standard deviation. The average emissions and standard deviation of the sample for carbon dioxide shall also be listed.

(3) The applicable exhaust emission standards to be met by listing specific options selected, designating when 100,000 or 120,000 mile standards apply, and designation where NMHC, THC, ~~OMHCE~~, OMNMHCE, or NMOG standards apply.

(f) Every aborted test and reason for abort shall be reported.

(g) If both four-wheel and two-wheel drive vehicles are included in an light-duty truck engine family under 4,000 pounds inertia weight, the quality-audit test

data from four-wheel drive vehicles shall be distinguished from and summarized separately from two-wheel drive vehicles.

~~(h) The final report shall include the date of the end of the manufacturer's model production year for each engine family.~~

~~(hi) If vehicles from different model-years are produced in any production quarter, separate reports shall be submitted for each model-year.~~

~~(i) For federally certified light-duty vehicles produced under the provisions of H & SC 43102(b), the emissions data and other information required in the quarterly reports shall be included in a separate section of the report. Where such federally certified light-duty vehicles are in the same engine family as medium-duty vehicles, all data from these medium-duty vehicles shall be deleted from the separate section. The separate section shall include the statistical summary required by Section (e)(2). The separate section of the report shall also include identical data for California engine families used for offsetting emissions of federally certified light-duty vehicles.~~

~~(j) The quarterly reports shall be submitted electronically (i.e., 3.5" diskette or electronic submission) in a format specified by the Executive Officer. In addition, a summary of the quarterly report shall be submitted in hard copy in a format specified by the Executive Officer.~~

~~8. SPECIAL REQUIREMENTS FOR SMALL VOLUME MANUFACTURERS~~

~~The following requirements apply only to those vehicle manufacturers who were granted relief by the Executive Officer under Title 13, C.A.C., Section 1960.4, Special Standards for 1982 and Subsequent Model Passenger Cars and 1983 and Subsequent Model Light-Duty Trucks and Medium-Duty Vehicles, 0-3999 Pound Equivalent Inertia Weight:~~

~~The requirements listed below are to be followed as supplemental to and when contrary to other requirements specified in part D. "Quality-Audit test Procedures", Sections "4. Evaluation", and "6. Reports". These requirements are listed to implement, define, and clarify the Board requirements of C.A.C. Section 1960.4:~~

~~(a) Additional Reporting Requirements for NOx Emissions~~

~~(1) The cumulative average of NOx emissions from the entire quality-audit light-duty trucks (LDT) plus medium-duty vehicles (MDV) 0-3999 lbs. equivalent inertia weight, shall be reported both before and after applying DF's for the 1983 model-year to:~~

~~(i) All 1983 models tested during each calendar quarter.~~

~~(ii) All 1983 models tested to date by the end of each calendar quarter.~~

~~(iii) All 1983 models tested to date by December 31, 1982, by June 30, 1983, and by December 31, 1983.~~

~~(2) The combined averages from the entire passenger car (PC) line and, separately, LDT and MDV lines, 0-3999 lbs. equivalent inertia weight, shall be reported both before and after applying DF's for:~~

~~(i) All 1983 model PC's tested during each calendar quarter.~~

~~(ii) All 1984 model PC's and, separately, LDT's plus MDV's tested during each calendar quarter.~~

~~(iii) All 1985 model LDT's plus MDV's tested during each calendar quarter.~~

~~(3) Subgroups~~

~~The NOx emission results shall be averaged and reported by engine family subgroup in each regular quarterly assembly-line report.~~

~~(b) Semi-Annual Evaluations~~

~~Joint ARB - manufacturer evaluations will be made each six months to determine compliance with the 0.7 g/mi NOx production level based on test results by engine families separately for 1983 and 1984 model PC's and 1984 and 1985 model LDT's plus MDV's tested and on a cumulative basis for 1983 model LDT's plus MDV's. The first evaluation will be made based on averaged NOx test data accumulated through December 31, 1982. Subsequent evaluations will be made semiannually for data accumulated through each June 30 and December 31 periods until December 31, 1984 for PC's and December 31, 1985, for LDT's plus MDV's model year productions.~~

~~If the NOx value exceeds the 0.7 g/mi level, but the manufacturer shows that unanticipated technical problems caused the 0.7 g/mi NOx production average to be exceeded, then appropriate relief will be made available. The relief will be made provided the manufacturer shows reasonable effort was made and will continue to be made towards meeting the 0.7 g/mi NOx levels for future production periods. This includes incorporating into production improved technology as soon as it becomes available.~~

~~After the evaluation, the Executive Officer can revoke Section 2109, Title 13 of the C.C.R, if combined test results exceed the 0.7 g/mi NOx level separately for 1983 and 1984 model PC's and 1984 and 1985 model LDT's plus MDV's, and on a cumulative basis for 1983 model LDT's plus MDV's provided that the manufacturer has not taken appropriate action.~~

8. RETENTION OF DATA

All vehicle emissions test data shall be retained for three calendar years from the end of model-year production.

DEFINITIONS

The definitions in CCR Title 13 Section 1900 (b) shall apply with the following additions:

1. Calendar Quarter is defined as those three month period of time which start on the first days of January, April, July and October.

2. First or Final Calendar Quarter Production is defined as the calendar quarter in which the production of an engine family begins or ends.

3. End of Assembly-Line is defined as that place where the final inspection test or quality-audit test is performed.

4. Assembly-Line Tests are those tests or inspections which are performed on or at the end of the assembly-line.

5. Assembly-Line Quality Audit-Test is defined as the test performed on a minimum sample of 2.0 percent (or other approved sample) of the production vehicles produced and delivered for sale in California.

6. Assembly-Line Inspection Tests are those tests performed pursuant to Section B of these procedures.

7. Functional Test is defined as a type of test or inspection which is performed on engines or vehicles to detect if the emission control system is operating properly.

8. Subgroup means a set of vehicles within an engine family distinguishable by characteristics contained in the manufacturer's application for certification.

9. Vehicles certified for sale in California means all vehicles certified to California emission requirements and all federally certified vehicles legal for sale in California.

APPENDIX A

ALTERNATE QUALITY-AUDIT VEHICLE SELECTION CRITERIA

This appendix sets forth the alternative procedure for selection of Quality-Audit vehicles. It includes the flow diagram in Figure A-1.

1. Vehicles shall be randomly selected at a rate of 2.0 percent of engine family production at the beginning of production. When test results of 30 vehicles have been accumulated, an evaluation as indicated below shall be made.

2. Calculate the family mean and standard deviation of each pollutant (HC, CO, NOx). Identify vehicles which have emission levels greater than three standard deviations above the mean. Eliminate these emission data points and recalculate the mean and standard deviation. Continue the calculation until there are no values greater than three standard deviations above the mean. Count the number of these data points greater than the standard (outliers). If the number of outliers is equal to or less than the allowable number in Table A-1 for each pollutant, the engine family is eligible to continue to a second evaluation shown in paragraph 3 below. Otherwise, sampling must continue at a rate of 2.0 percent of production for the rest of the month.

3. If the allowable outlier criteria is met, the family mean, standard deviation, and sample size determined for each contaminant before excluding any outliers, is substituted in the following expression:

$$\frac{(\text{emission standard} - \text{mean}) (N^{1/2})}{(\text{standard deviation})}$$

If the expression is greater than C in Table A-2 below, and the manufacturer reasonably estimates that the quarterly engine family production will exceed 5,000 vehicles, the sampling rate for the remaining portion of the calendar month following the date of selection of the last of the 30 vehicles shall be 30 per month, applied on a prorated basis. If the expression is greater than C in Table A-2 below, and the manufacturer reasonably estimates that the quarterly engine family production will be 5,000 vehicles or less, the sampling rate for the remaining portion of the calendar month following the date of selection of the last of the 30 vehicles shall be 17 per month, applied on a prorated basis. If the expression is equal to or less than C in Table A-2, the sampling rate shall continue to be 2.0 percent of production for the remaining portion of the month in which selection of the 30 vehicles is completed. The value of C is a function of the coefficient of variation (standard deviation/mean). The coefficient of variation and "C" shall be rounded to the number of decimal places shown in Table A-2.

Table A-1

Sample Size	Allowable Outliers	Sample size	Allowable Outliers
1- 32	1	430-478	11
33- 68	2	479-528	12
69-107	3	529-578	13
108-149	4	579-629	14
150-193	5	630-680	15
194-238	6	681-731	16
239-285	7	732-783	17
286-332	8	784-835	18
333-380	9	836-887	19
381-429	10	888-939	20

Table A-2

Coefficient of Variation	C
0.1	0.5
0.2	1.2
0.3	1.8
0.4	2.5
0.5	3.1
0.6	3.8
0.7	4.4
0.8	5.1
0.9	5.7

4. For each remaining calendar month in the quarter, both mathematical procedures set forth in paragraph 2 and 3 shall be repeated at the end of the preceding month, using all of the test data accumulated in the quarter. The sampling rate for each remaining calendar month in the quarter shall be 30 vehicles per month, 17 vehicles per month, or 2.0 percent of the production as determined under the standards in paragraph 3.

5. At the end of the quarter, all of the data accumulated during the quarter is evaluated, and the compliance of the family with emission standards is determined.

6. For each subsequent quarter, the preceding sample selection method shall be followed. The sample rate determination for the first month of each subsequent quarter shall be based on the accumulated data from the previous quarter. The sample rate for the succeeding months of the quarter shall be determined as previously set forth.

7. If the start of production does not coincide with the first of a quarter, the sequence for sample rate determination shall be followed, but references to remaining calendar months may not be appropriate.

8. Where a manufacturer has sampled vehicles at a rate of 17 per month following a reasonable estimate that the quarterly engine family production will be 5,000 vehicles or less, and subsequently determines, or reasonably should determine based on information available to the manufacturer, that the quarterly engine family production will exceed 5,000 vehicles, the manufacturer shall increase the sampling rate for the quarter such that the requirements of paragraph 3 applicable to families reasonably estimated to exceed a quarterly production of 5,000 vehicles are satisfied.

FIGURE A-1

FIRST QUARTER OF PROD.

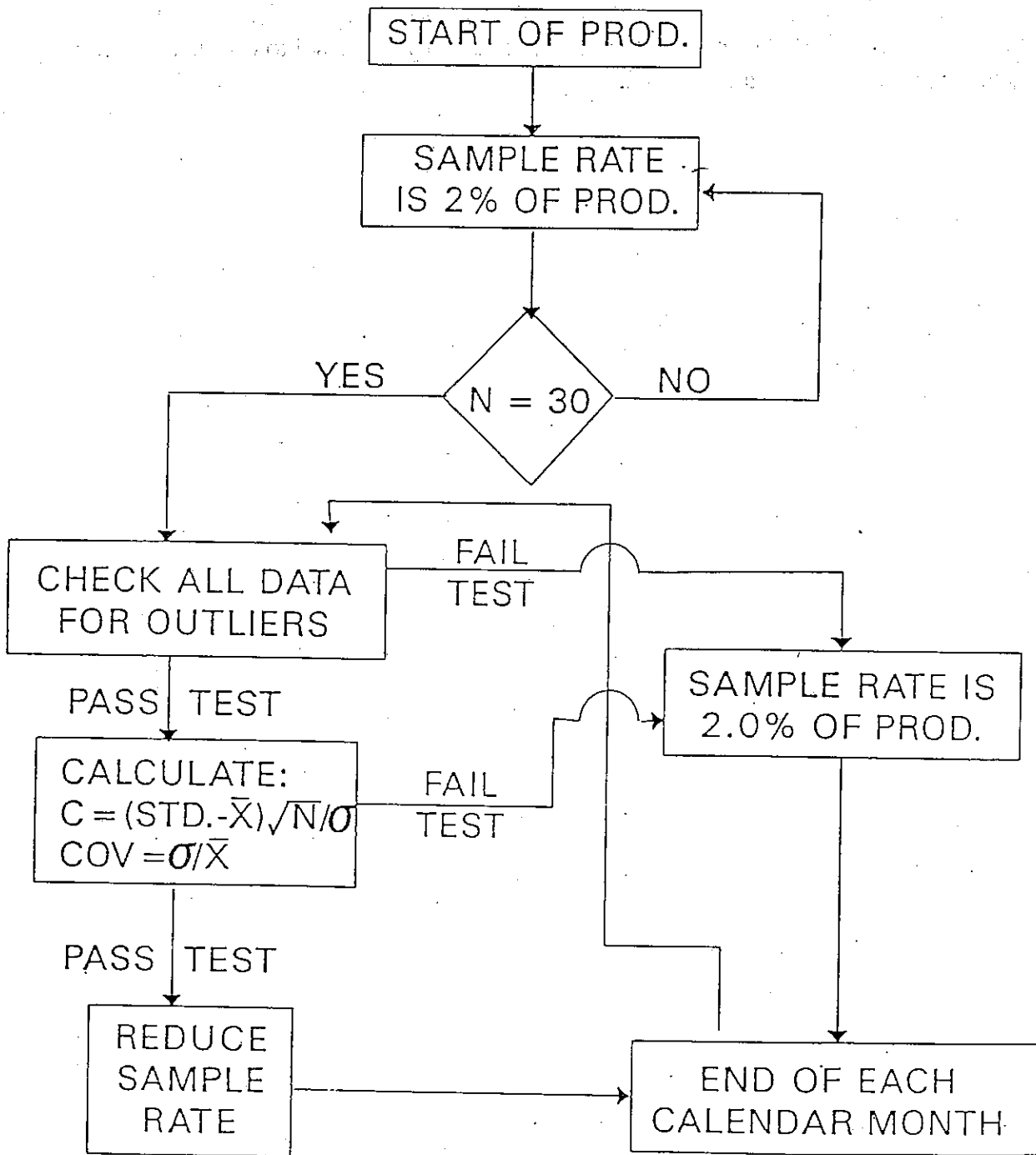


FIGURE A-1

SUBSEQUENT QUARTERS

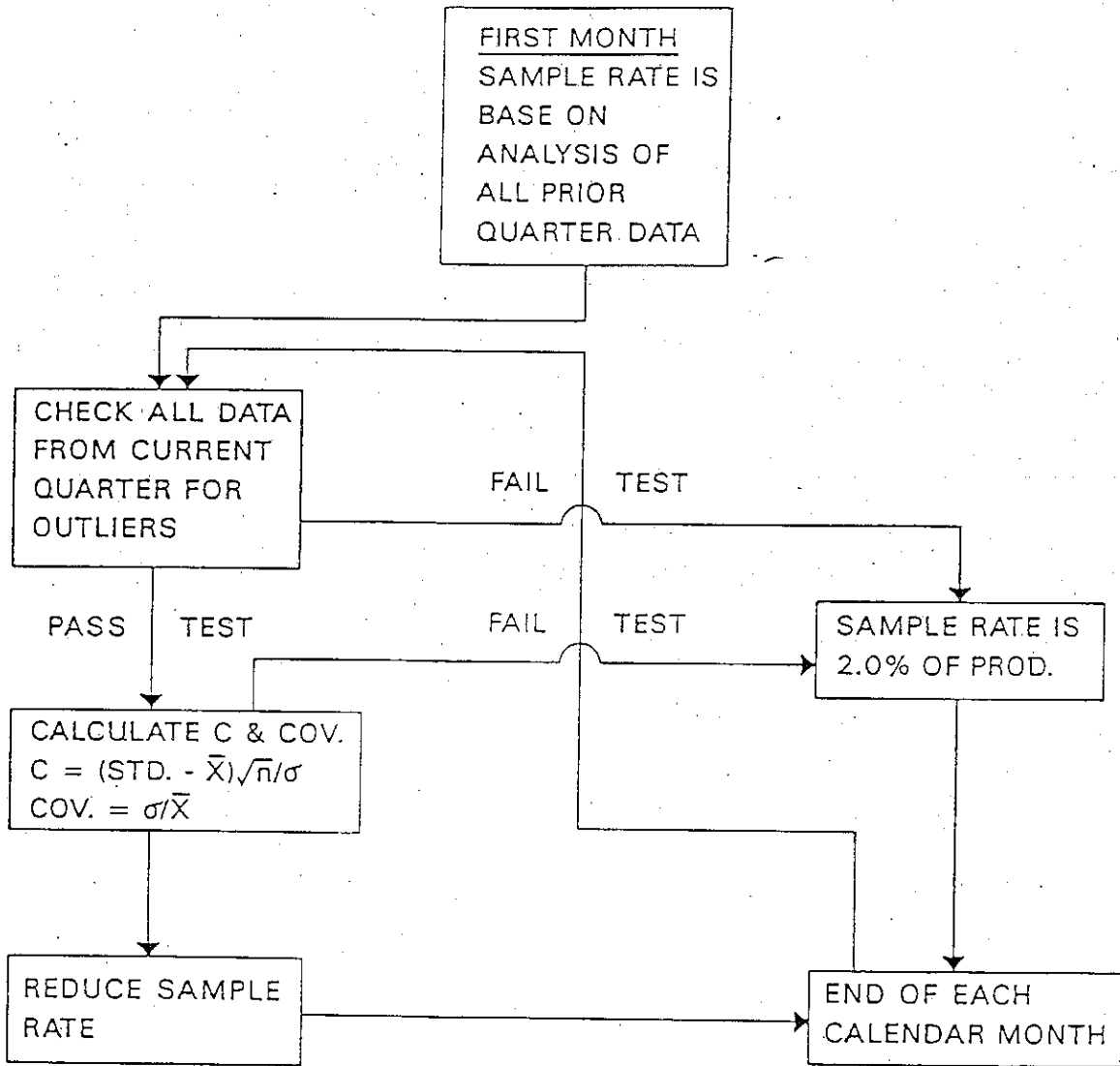


FIGURE A-1
OUTLIER CALCULATION PROCEDURE

1. CALCULATE THE MEAN AND STANDARD DEVIATION FOR EACH POLLUTANT WITH DF APPLIED.
2. CALCULATE THE MEAN PLUS THREE STANDARD DEVIATIONS.
3. IDENTIFY ALL EMISSION DATA GREATER THAN $X + 3\sigma$ STANDARD DEVIATIONS.
4. REMOVE THE OUTLIERS FROM THE DATA AND RECALCULATE THE MEAN AND STANDARD DEVIATION.
5. REPEAT STEPS 2, 3, 8, 4.
6. REPEAT STEPS 2, 8, 3
7. IDENTIFY ALL OUTLIERS THAT EXCEED APPLICABLE CERTIFICATION STANDARD AND COUNT THE NUMBER.
8. COMPARE THE NUMBER OF OUTLIERS WITH THE MAXIMUM ALLOWED BY THE OUTLIER TABLE. IF THE NUMBER OF OUTLIERS EXCEEDS THE MAXIMUM, SAMPLE RATE IS 2.0% OF PRODUCTION. IF THE NUMBER IS LESS THAN THE MAXIMUM ALLOWED, CALCULATE "C".

APPENDIX B

EMISSION CONTROL COMPONENTS AND SYSTEMS

Air Diverter Valve
Air/Fuel Control System
Air Injection Control Valves
Air Injection Pump
Camshaft Position Sensor
Canister Purge Valve
Carburetor or Fuel Injection System
Catalyst
Choke
Controlled Air Intake System
Coolant Temperature Sensor
Crankshaft Position Sensor
Diesel Particulate Control System
Distributor
EGR Control System Components
Electronic (Computer) Control System
Emissions Related Hoses, Tubing, Clamps, Belts, Fittings, Wiring,
Connectors, Sensors and Switches.
Evaporative System
Exhaust Gas Recirculation
Ignition Coil & Wires
Ignition Control Module
Intake Air Temperature Sensor
Malfunction Indicator Light (MIL)
Mass Air Flow Sensor
Misfire Detection System
On-Board Diagnostic System
Oxygen Sensor
Positive Crankcase Ventilation
Power Train Control Module (Built-in test, BIT)
Throttle Position Sensor
Vacuum Hose Connections

