

## PROPOSED REGULATION ORDER

Note: The regulatory amendments proposed in this rulemaking are show in underline to indicate additions and ~~strikeout~~ to indicate deletions compared to the version amended on July 24, 1996. The entry "[No Change]" following a section means that amendments to that section are not being proposed.

Amend Title 13, California Code of Regulations, sections 1960.1 and 2102 to read as follows:

### **Section 1960.1. Exhaust Emission Standards and Test Procedures - 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.**

(a) through (j) [No Change]

(k) The test procedures for determining compliance with these standards are set forth in "California Exhaust Emission Standards and Test Procedures for 1981 through 1987 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," adopted by the state board on November 23, 1976, as last amended May 20, 1987, and in "California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," adopted by the state board on May 20, 1987, as last amended ~~July 24, 1996~~ \_\_\_\_\_, both of which are incorporated herein by reference.

(l) through (p) [No Change]

(q) The Supplemental Federal Test Procedure (SFTP) exhaust emission levels from new 2001 and subsequent model passenger cars and light-duty trucks, other than low-emission vehicles, ultra-low-emission vehicles, and zero-emission vehicles, shall not exceed:

**SFTP EXHAUST EMISSION STANDARDS FOR 2001 AND SUBSEQUENT MODEL-YEAR PASSENGER CARS AND LIGHT-DUTY TRUCKS OTHER THAN LOW-EMISSION VEHICLES, ULTRA-LOW-EMISSION VEHICLES, AND ZERO-EMISSION VEHICLES**  
(grams per mile)<sup>4,5,6,7,8,9,10</sup>

<u>Vehicle Type<sup>1</sup></u>	<u>Loaded Vehicle Weight (lbs.)</u>	<u>Durability Vehicle Basis (mi)</u>	<u>Fuel Type</u>	<u>NMHC<sup>2</sup> + NOx<sup>1</sup> Composite<sup>3</sup></u>	<u>A/C<sup>1</sup> Test</u>	<u>CO<sup>1</sup></u>	
						<u>US06<sup>1</sup> Test</u>	<u>Composite Option<sup>3</sup></u>
<u>PC</u>	<u>All</u>	<u>50,000</u>	<u>Gasoline</u>	<u>0.65</u>	<u>3.0</u>	<u>9.0</u>	<u>3.4</u>
			<u>Diesel</u>	<u>1.48</u>	<u>NA</u>	<u>9.0</u>	<u>3.4</u>
		<u>100,000</u>	<u>Gasoline</u>	<u>0.91</u>	<u>3.7</u>	<u>11.1</u>	<u>4.2</u>
			<u>Diesel</u>	<u>2.07</u>	<u>NA</u>	<u>11.1</u>	<u>4.2</u>
<u>LDT</u>	<u>0-3750</u>	<u>50,000</u>	<u>Gasoline</u>	<u>0.65</u>	<u>3.0</u>	<u>9.0</u>	<u>3.4</u>
			<u>Diesel</u>	<u>1.48</u>	<u>NA</u>	<u>9.0</u>	<u>3.4</u>
		<u>100,000</u>	<u>Gasoline</u>	<u>0.91</u>	<u>3.7</u>	<u>11.1</u>	<u>4.2</u>
			<u>Diesel</u>	<u>2.07</u>	<u>NA</u>	<u>11.1</u>	<u>4.2</u>
<u>LDT</u>	<u>3751-5750</u>	<u>50,000</u>	<u>Gasoline</u>	<u>1.02</u>	<u>3.9</u>	<u>11.6</u>	<u>4.4</u>
			<u>Diesel</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
		<u>100,000</u>	<u>Gasoline</u>	<u>1.37</u>	<u>4.9</u>	<u>14.6</u>	<u>5.5</u>
			<u>Diesel</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>

(1) Abbreviations.

“PC” means passenger car.

“LDT” means light-duty truck.

“NMHC+NOx” means non-methane hydrocarbon plus oxides of nitrogen emissions.

“CO” means carbon monoxide emissions.

“A/C” means air-conditioning.

“US06” means the test cycle designed to evaluate emissions during aggressive and microtransient driving.

- (2) *Non-Methane Hydrocarbon Emissions.* For PCs and LDTs certified to the FTP exhaust standards in section 1960.1(f)(2), hydrocarbon emissions shall be measured in accordance with the “California Non-Methane Hydrocarbon Test Procedures” as last amended May 15, 1990, which is incorporated herein by reference. For PCs and LDTs certified as transitional low-emission vehicles, hydrocarbon emissions shall be measured in accordance with Part B (Determination of Non-Methane Hydrocarbon Mass Emissions by Flame Ionization Detection) of the “California Non-Methane Organic Gas Test Procedures” as incorporated by reference in section 1960.1(g)(1), note (3). For alcohol-fueled vehicles certifying to these standards, including flexible-fuel vehicles when certifying on methanol or ethanol, “Non-Methane Hydrocarbons” shall mean “Organic Material Non-Methane Hydrocarbon Equivalent.”
- (3) *Composite Standards.* Compliance with the composite standards shall be demonstrated using the calculations set forth in the section 86.164-00, Title 40, Code of Federal Regulations, as adopted October 22, 1996, which is incorporated herein by reference.
- (4) *SFTP.* SFTP means the additional test procedure designed to measure emissions during aggressive and microtransient driving, as described in section 86.159-00, Title 40, Code of Federal Regulations, as adopted October 22, 1996, over the US06 cycle, and also the test procedure designed to measure urban driving emissions while the vehicle’s air conditioning system is operating, as described in section 86.160-00, Title 40, Code of Federal Regulations, as adopted October 22, 1996, over the SC03 cycle. These sections of the Code of Federal Regulations are incorporated herein by reference.
- (5) *Applicability to Alternative Fuel Vehicles.* These SFTP standards do not apply to vehicles certified on fuels other than gasoline and diesel fuel, but the standards do apply to the gasoline and diesel fuel operation of flexible-fuel vehicles and dual-fuel vehicles.
- (6) *Air to Fuel Ratio Requirement.* With the exception of cold-start conditions, warm-up conditions and rapid-throttle motion conditions (“tip-in” or “tip-out” conditions), the air to fuel ratio shall not be richer at any time than, for a given engine operating condition (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters), the leanest air to fuel mixture required to obtain maximum torque (lean best torque), with a tolerance of six percent of the fuel consumption. The Executive Officer may approve a manufacturer’s request for approval to use additional enrichment in subsequent testing if the manufacturer demonstrates that additional enrichment is needed to protect the vehicle, occupants, engine, or emission control hardware.

(7) A/C-on Specific Calibrations. A/C-on specific calibrations (e.g. air to fuel ratio, spark timing, and exhaust gas recirculation), may be used which differ from A/C-off calibrations for given engine operating conditions (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters). Such calibrations must not unnecessarily reduce the NMHC+NO<sub>x</sub> emission control effectiveness during A/C-on operation when the vehicle is operated under conditions which may reasonably be expected to be encountered during normal operation and use. If reductions in control system NMHC+NO<sub>x</sub> effectiveness do occur as a result of such calibrations, the manufacturer shall, in the Application for Certification, specify the circumstances under which such reductions do occur, and the reason for the use of such calibrations resulting in such reductions in control system effectiveness.

A/C-on specific “open-loop” or “commanded enrichment” air-fuel enrichment strategies (as defined below), which differ from A/C-off “open-loop” or “commanded enrichment” air-fuel enrichment strategies, may not be used, with the following exceptions: cold-start and warm-up conditions, or, subject to Executive Officer approval, conditions requiring the protection of the vehicle, occupants, engine, or emission control hardware. With these exceptions, such strategies which are invoked based on manifold pressure, engine speed, throttle position, or other engine parameters shall use the same engine parameter criteria for the invoking of this air-fuel enrichment strategy and the same degree of enrichment regardless of whether the A/C is on or off.

“Open-loop” or “commanded” air-fuel enrichment strategy is defined as enrichment of the air to fuel ratio beyond stoichiometry for the purposes of increasing engine power output and the protection of engine or emissions control hardware. However, “closed-loop biasing,” defined as small changes in the air-fuel ratio for the purposes of optimizing vehicle emissions or driveability, shall not be considered an “open-loop” or “commanded” air-fuel enrichment strategy. In addition, “transient” air-fuel enrichment strategy (or “tip-in” and “tip-out” enrichment), defined as the temporary use of an air-fuel ratio rich of stoichiometry at the beginning or duration of rapid throttle motion, shall not be considered an “open-loop” or “commanded” air-fuel enrichment strategy.

(8) “Lean-On-Cruise” Calibration Strategies. “Lean-on-cruise” air-fuel calibration strategies shall not be employed during vehicle operation in normal driving conditions, unless such strategies are also substantially employed during the SFTP. A “lean-on-cruise” air-fuel calibration strategy is defined as the use of an air-fuel ratio significantly greater than stoichiometry, during non-deceleration conditions at speeds above 40 mph, for the purposes of improving fuel economy or other purposes. A/C-on “lean-on-cruise” strategies which differ from A/C-off “lean-on-cruise” strategies for a given engine operating condition (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters) shall not be used.

(9) Phase-In Requirements. For the purposes of this section 1960.1(q) only, each manufacturer's PC and LDT fleet shall be defined as the total projected number of PCs and LDTs from 0-5750 pounds loaded vehicle weight certified to the FTP exhaust standards of section 1960.1(f)(2) and certified as transitional low-emission vehicles sold in California. As an option, a manufacturer may elect to have its total PC and LDT fleet defined, for the purposes of this section 1960.1(q) only, as the total projected number of the manufacturer's PCs and LDTs, other than zero-emission vehicles, certified and sold in California.

a. Manufacturers of PCs and of LDTs, except small volume manufacturers, shall certify a minimum percentage of their PC and LDT fleet according to the following phase-in schedule.

<i>Model Year</i>	<i>Percentage of PC and LDT Fleet</i>
<u>2001</u>	<u>25</u>
<u>2002</u>	<u>50</u>
<u>2003</u>	<u>85</u>
<u>2004 and subsequent</u>	<u>100</u>

b. Small volume manufacturers of PCs and LDTs shall certify 100% of their PC and LDT fleet in the 2004 and subsequent model years.

(10) Single-Roll Electric Dynamometer Requirement. For all vehicles certified to the SFTP standards, a single-roll electric dynamometer or a dynamometer which produces equivalent results, as set forth in the "California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" as incorporated by reference in section 1960.1(k), must be used for all types of emission testing to determine compliance with the associated emission standards.

(r) The Supplemental Federal Test Procedure (SFTP) standards in this section represent the maximum SFTP exhaust emissions at 4,000 miles +/- 250 miles or at the mileage determined by the manufacturer for emission-data vehicles in accordance with the “California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles” as incorporated by reference in section 1960.1(k). The SFTP exhaust emission levels from new 2001 and subsequent model low-emission vehicles and ultra-low-emission vehicles in the passenger car and light-duty truck class, and new 2003 and subsequent low-emission vehicles, ultra-low-emission vehicles, and super-ultra-low-emission vehicles in the medium-duty class, shall not exceed:

**SFTP EXHAUST EMISSION STANDARDS**  
**FOR LOW-EMISSION VEHICLES, ULTRA-LOW-EMISSION VEHICLES, AND**  
**SUPER-ULTRA-LOW-EMISSION VEHICLES IN THE PASSENGER CAR, LIGHT-**  
**DUTY TRUCK, AND MEDIUM-DUTY VEHICLE CLASSES**  
 (grams per mile)<sup>6,7,8,9,10,11</sup>

<u>Vehicle Type<sup>1</sup></u>	<u>Loaded Vehicle Weight (lbs.)<sup>2</sup></u>	<u>US06 Test<sup>1</sup></u>		<u>A/C Test<sup>1,5</sup></u>	
		<u>NMHC<sup>4</sup> + NOx<sup>1</sup></u>	<u>CO<sup>1</sup></u>	<u>NMHC<sup>4</sup> + NOx<sup>1</sup></u>	<u>CO<sup>1</sup></u>
<u>PC</u>	<u>All</u>	<u>0.14</u>	<u>8.0</u>	<u>0.20</u>	<u>2.7</u>
<u>LDT</u>	<u>0-3750</u>	<u>0.14</u>	<u>8.0</u>	<u>0.20</u>	<u>2.7</u>
<u>LDT</u>	<u>3751-5750</u>	<u>0.25</u>	<u>10.5</u>	<u>0.27</u>	<u>3.5</u>
<u>MDV</u>	<u>3751-5750</u>	<u>0.40</u>	<u>10.5</u>	<u>0.31</u>	<u>3.5</u>
<u>MDV</u>	<u>5751-8500<sup>3</sup></u>	<u>0.60</u>	<u>11.8</u>	<u>0.44</u>	<u>4.0</u>

- (1) Abbreviations.  
“PC” means passenger car.  
“LDT” means light-duty truck.  
“MDV” means medium-duty truck.  
“NMHC+NOx” means non-methane hydrocarbon plus oxides of nitrogen emissions.  
“CO” means carbon monoxide emissions.  
“US06” means the test cycle designed to evaluate emissions during aggressive and microtransient driving.  
“A/C” means air-conditioning.

- (2) For MDVs, “Loaded Vehicle Weight” shall mean “Test Weight,” which is the average of the vehicle’s curb weight and gross vehicle weight.

- (3) Vehicles with a gross vehicle weight rating over 8,500 pounds are exempted from the requirements of this subsection.
- (4) *Non-Methane Hydrocarbon Emissions.* Hydrocarbon emissions shall be measured in accordance with Part B (Determination of Non-Methane Hydrocarbon Mass Emissions by Flame Ionization Detection) of the “California Non-Methane Organic Gas Test Procedures” as incorporated by reference in section 1960.1(g)(1), note (3). For alcohol-fueled vehicles certifying to these standards, including flexible-fuel vehicles when certifying on methanol or ethanol, “Non-Methane Hydrocarbons” shall mean “Organic Material Non-Methane Hydrocarbon Equivalent.”
- (5) *A/C-on Specific Calibrations.* A/C-on specific calibrations (e.g. air to fuel ratio, spark timing, and exhaust gas recirculation), may be used which differ from A/C-off calibrations for given engine operating conditions (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters). Such calibrations must not unnecessarily reduce the NMHC+NOx emission control effectiveness during A/C-on operation when the vehicle is operated under conditions which may reasonably be expected to be encountered during normal operation and use. If reductions in control system NMHC+NOx effectiveness do occur as a result of such calibrations, the manufacturer shall, in the Application for Certification, specify the circumstances under which such reductions do occur, and the reason for the use of such calibrations resulting in such reductions in control system effectiveness.

A/C-on specific “open-loop” or “commanded enrichment” air-fuel enrichment strategies (as defined below), which differ from A/C-off “open-loop” or “commanded enrichment” air-fuel enrichment strategies, may not be used, with the following exceptions: cold-start and warm-up conditions, or, subject to Executive Officer approval, conditions requiring the protection of the vehicle, occupants, engine, or emission control hardware. With these exceptions, such strategies which are invoked based on manifold pressure, engine speed, throttle position, or other engine parameters shall use the same engine parameter criteria for the invoking of this air-fuel enrichment strategy and the same degree of enrichment regardless of whether the A/C is on or off.

“Open-loop” or “commanded” air-fuel enrichment strategy is defined as enrichment of the air to fuel ratio beyond stoichiometry for the purposes of increasing engine power output and the protection of engine or emissions control hardware. However, “closed-loop biasing,” defined as small changes in the air-fuel ratio for the purposes of optimizing vehicle emissions or driveability, shall not be considered an “open-loop” or “commanded” air-fuel enrichment strategy. In addition, “transient” air-fuel enrichment strategy (or “tip-in” and “tip-out” enrichment), defined as the temporary use of an air-fuel ratio rich of stoichiometry at the beginning or duration of rapid throttle motion, shall not be considered an “open-loop” or “commanded” air-fuel enrichment strategy.

- (6) SFTP. SFTP means the additional test procedure designed to measure emissions during aggressive and microtransient driving, as described in section 86.159-00, Title 40, Code of Federal Regulations, as adopted October 22, 1996, over the US06 cycle, and also the test procedure designed to measure urban driving emissions while the vehicle's air conditioning system is operating, as described in section 86.160-00, Title 40, Code of Federal Regulations, as adopted October 22, 1996, over the SC03 cycle. These sections of the Code of Federal Regulations are incorporated herein by reference.
- (7) Applicability to Alternative Fuel Vehicles. These SFTP standards do not apply to vehicles certified on fuels other than gasoline and diesel fuel, but the standards do apply to the gasoline and diesel fuel operation of flexible-fuel vehicles and dual-fuel vehicles.
- (8) Air to Fuel Ratio Requirement. With the exception of cold-start conditions, warm-up conditions and rapid-throttle motion conditions ("tip-in" or "tip-out" conditions), the air to fuel ratio shall not be richer at any time than, for a given engine operating condition (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters), the leanest air to fuel mixture required to obtain maximum torque (lean best torque), with a tolerance of six percent of the fuel consumption. The Executive Officer may approve a manufacturer's request for approval to use additional enrichment in subsequent testing if the manufacturer demonstrates that additional enrichment is needed to protect the vehicle, occupants, engine, or emission control hardware.
- (9) "Lean-On-Cruise" Calibration Strategies. "Lean-on-cruise" air-fuel calibration strategies shall not be employed during vehicle operation in normal driving conditions, unless such strategies are also substantially employed during the SFTP. A "lean-on-cruise" air-fuel calibration strategy is defined as the use of an air-fuel ratio significantly greater than stoichiometry, during non-deceleration conditions at speeds above 40 mph, for the purposes of improving fuel economy or other purposes. A/C-on "lean-on-cruise" strategies which differ from A/C-off "lean-on-cruise" strategies for a given engine operating condition (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters) shall not be used.
- (10) Phase-In Requirements. For the purposes of this 1960.1(r) section only, each manufacturer's PC and LDT fleet shall be defined as the total projected number of low-emission and ultra-low-emission PCs and LDTs from 0-5750 pounds loaded vehicle weight sold in California. Each manufacturer's MDV fleet shall be defined as the total projected number of low-emission, ultra-low-emission, and super-ultra-low-emission MDVs less than 8501 pounds gross vehicle weight rating sold in California.  
a. Manufacturers of PCs, LDTs, and MDVs, except small volume manufacturers, shall certify a minimum percentage of their PC and LDT fleet, and a minimum percentage of their MDV fleet, according to the following phase-in schedule.

<u>Model Year</u>	<u>Percentage</u>	
	<u>PC, LDT1</u>	<u>MDV</u>
<u>2001</u>	<u>25</u>	<u>NA</u>
<u>2002</u>	<u>50</u>	<u>NA</u>
<u>2003</u>	<u>85</u>	<u>25</u>
<u>2004</u>	<u>100</u>	<u>50</u>
<u>2005 and subsequent</u>	<u>100</u>	<u>100</u>

b. Manufacturers may use an “Alternative or Equivalent Phase-in Schedule” to comply with the phase-in requirements. An “Alternative Phase-in” is one that achieves at least equivalent emission reductions by the end of the last model year of the scheduled phase-in. Model-year emission reductions shall be calculated by multiplying the percent of vehicles (based on the manufacturer’s projected California sales volume of the applicable vehicle fleet) meeting the new requirements per model year by the number of model years implemented prior to and including the last model year of the scheduled phase-in. The “cumulative total” is the summation of the model-year emission reductions (e.g., a four model-year 25/50/85/100 percent phase-in schedule would be calculated as: (25%\*4 years) + (50%\*3 years) + (85%\*2 years) + (100%\*1 year) = 520). Any alternative phase-in that results in an equal or larger cumulative total than the required cumulative total by the end of the last model year of the scheduled phase-in shall be considered acceptable by the Executive Officer under the following conditions: 1) all vehicles subject to the phase-in shall comply with the respective requirements in the last model year of the required phase-in schedule and 2) if a manufacturer uses the optional phase-in percentage determination in section 1960.1(q) note (9), the cumulative total of model-year emission reductions as determined only for PCs and LDTs certified to this section 1960.1(r) must also be equal to or larger than the required cumulative total by end of the 2004 model year. Manufacturers shall be allowed to include vehicles introduced before the first model year of the scheduled phase-in (e.g., in the previous example, 10 percent introduced one year before the scheduled phase-in begins would be calculated as: (10%\*5 years) and added to the cumulative total).

c. Small volume manufacturers of PCs, LDTs, and MDVs shall certify 100% of their PC and LDT fleet in 2004 and subsequent model years, and 100% of their MDV fleet in 2005 and subsequent model years.

(11) Single-Roll Electric Dynamometer Requirement. For all vehicles certified to the SFTP standards, a single-roll electric dynamometer or a dynamometer which produces equivalent results, as set forth in the “California Exhaust Emission Standards and Test

Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles” as incorporated by reference in section 1960.1(k), must be used for all types of emission testing to determine compliance with the associated emission standards.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104, and 43105, Health and Safety Code. Reference: Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43103, 43104, 43105, 43106, 43107, and 43204 - 43205.5, Health and Safety Code.

**Section 2101. Compliance Testing and Inspection - New Vehicle Selection, Evaluation, and Enforcement Action.**

(a) [No Change]

(b) If the vehicles are selected for compliance testing, the selection and testing of vehicles and the evaluation of data shall be made in accordance with the "California New Vehicle Compliance Test Procedures," adopted by the state board on June 24, 1976 and last amended June 24, 1996. Testing of passenger cars and light-duty-trucks certified to the low-emission and ultra-low-emission exhaust standards to determine compliance with the Supplemental Federal Test Procedure emission standards shall commence in the 2002 model year. Motorcycles scheduled for compliance testing shall be selected, tested, and evaluated in accordance with the "California New Motorcycle Compliance Test Procedures," adopted by the state board on June 30, 1977, and amended November 24, 1981.

(c) through (d) [No Change]

NOTE: Authority cited: Sections 39600, 39601 and 43104, Health and Safety Code. Reference: Sections 39002, 39003, 39500, 43000, 43106, 43202, 43210, 43211 and 43212, Health and Safety Code.