

(i) Shall not in its operation or function cause the emission into the ambient air of any noxious or toxic substance that would not be emitted in the operation of such vehicle (or engine) without such system, except as specifically permitted by regulation; and

(ii) Shall not in its operation, function or malfunction result in any unsafe condition endangering the motor vehicle, its occupants, or persons or property in close proximity to the vehicle.

(2) In establishing the physically adjustable range of each adjustable parameter on a new motor vehicle (or new motor vehicle engine), the manufacturer shall ensure that, taking into consideration the production tolerances, safe vehicle driveability characteristics are available within that range, as required by section 202(a)(4) of the Clean Air Act.

(3) Every manufacturer of new motor vehicles (or new motor vehicle engines) subject to any of the standards imposed by this subpart shall, prior to taking any of the actions specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicles (or motor vehicle engines) in accordance with good engineering practice to ascertain that such test vehicles (or test engines) will meet the requirements of this section for the useful life of the vehicle (or engine).

[54 FR 14460, Apr. 11, 1989, as amended at 61 FR 58106, Nov. 12, 1996]

§ 86.090-8 Emission standards for 1990 and later model year light-duty vehicles.

(a)(1) Exhaust emissions from 1990 and later model year light-duty vehicles shall not exceed (compliance with these standards is optional for 1990 model year methanol-fueled vehicles):

(i)(A) *Hydrocarbons (for petroleum-fueled Otto-cycle and diesel vehicles)*. 0.41 gram per vehicle mile (0.26 gram per vehicle kilometer).

(B) *Total Hydrocarbon Equivalent (for methanol-fueled Otto-cycle and diesel vehicles)*. 0.41 gram per vehicle mile (0.26 gram per vehicle kilometer).

(ii) *Carbon monoxide*. 3.4 grams per vehicle mile (2.1 grams per vehicle kilometer).

(iii) *Oxides of nitrogen*. 1.0 gram per vehicle mile (0.63 gram per vehicle kilometer).

(iv) *Particulate (for diesel vehicles only)*.

(A) 0.20 gram per vehicle mile (0.12 gram per vehicle kilometer).

(B) A manufacturer may elect to include all or some of its diesel light-duty vehicle engine families in the appropriate particulate averaging program (petroleum or methanol), provided that vehicles produced for sale in California or in designated high-altitude areas may be averaged only within each of these areas. Averaging is not permitted between fuel types. If the manufacturer elects to average light-duty vehicles and light-duty trucks together in the appropriate particulate averaging program, its composite particulate standard applies to the combined set of light-duty vehicles and light-duty trucks included in the average and is calculated as defined in § 86.090-2.

(2) The standards set forth in paragraph (a)(1) of this section refer to the exhaust emitted over a driving schedule as set forth in subpart B of this part and measured and calculated in accordance with those procedures.

(b) Fuel evaporative emissions from 1990 and later model year light-duty vehicles shall not exceed (compliance with these standards is optional for 1990 model year methanol-fueled engines):

(1) *Hydrocarbons (for gasoline-fueled vehicles)*. 2.0 grams per test.

(2) *Total Hydrocarbon Equivalent (for methanol-fueled vehicles)*. 2.0 grams carbon per test.

(3) The standards set forth in paragraphs (b) (1) and (2) of this section refers to a composite sample of the fuel evaporative emissions collected under the conditions set forth in subpart B of this part and measured in accordance with those procedures.

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any 1990 and later model year Otto-cycle or methanol-fueled diesel light-duty vehicle.

(d)-(f) [Reserved]

(g) Any 1990 and later model year light-duty vehicle that a manufacturer wishes to certify for sale shall meet the

emission standards under both low- and high-altitude conditions as specified in § 86.082-2, except as provided in paragraphs (h) and (i) of this section. Vehicles shall meet emission standards under both low- and high-altitude conditions without manual adjustments or modifications. Any emission control device used to meet emission standards under high-altitude conditions shall initially actuate (automatically) no higher than 4,000 feet above sea level.

(h) The manufacturer may exempt 1990 and later model year vehicles from compliance at high altitude with the emission standards set forth in paragraphs (a) and (b) of this section if the vehicles are not intended for sale at high altitude and if the requirements of paragraphs (h) (1) and (2) of this section are met.

(1) A vehicle configuration shall only be considered eligible for exemption under paragraph (h) of this section if the requirements of either paragraph (h) (1) (i), (ii), (iii), or (iv) of this section are met.

(i) Its design parameters (displacement-to-weight ratio (D/W) and engine speed-to-vehicle-speed ratio (N/V)) fall within the exempted range for that manufacturer for that year. The exempted range is determined according to the following procedure:

(A) The manufacturer shall graphically display the D/W and N/V data of all vehicle configurations it will offer for the model year in question. The axis of the abscissa shall be D/W (where (D) is the engine displacement expressed in cubic centimeters and (W) is the equivalent vehicle test weight expressed in pounds), and the axis of the ordinate shall be N/V (where (N) is the crankshaft speed expressed in revolutions per minute and (V) is the vehicle speed expressed in miles per hour). At the manufacturer's option, either the 1:1 transmission gear ratio or the lowest numerical gear ratio available in the transmission will be used to determine N/V. The gear selection must be the same for all N/V data points on the manufacturer's graph. For each transmission/axle ratio combination, only the lowest N/V value shall be used in the graphical display.

(B) The product line is then defined by the equation, $N/V=C(D/W)^{-0.9}$, where

the constant, C, is determined by the requirement that all the vehicle data points either fall on the line or lie to the upper right of the line as displayed on the graphs.

(C) The exemption line is then defined by the equation, $N/V=C(0.84 D/W)^{-0.9}$, where the constant, C is the same as that found in paragraph (h)(1)(i)(B) of this section.

(D) The exempted range includes all values of N/V and D/W which simultaneously fall to the lower left of the exemption line as drawn on the graph.

(ii) Its design parameters fall within the alternate exempted range for that manufacturer that year. The alternate exempted range is determined by substituting rated horsepower (hp) for displacement (D) in the exemption procedure described in paragraph (h)(1)(i) of this section and by using the product line $N/V=C(\text{hp}/W)^{-0.9}$.

(A) Rated horsepower shall be determined by using the Society of Automotive Engineers Test Procedure J 1349, or any subsequent version of that test procedure. Any of the horsepower determinants within that test procedure may be used, as long as it is used consistently throughout the manufacturer's product line in any model year.

(B) No exemptions will be allowed under paragraph (h)(1)(ii) of this section to any manufacturer that has exempted vehicle configurations as set forth in paragraph (h)(1)(i) of this section.

(iii) Its acceleration time (the time it takes a vehicle to accelerate from 0 miles per hour to a speed not less than 40 miles per hour and not greater than 50 miles per hour) under high-altitude conditions is greater than the largest acceleration time under low-altitude conditions for that manufacturer for that year. The procedure to be followed in making this determination is:

(A) The manufacturer shall list the vehicle configuration and acceleration time under low-altitude conditions of that vehicle configuration which has the highest acceleration time under low-altitude conditions of all the vehicle configurations it will offer for the model year in question. The manufacturer shall also submit a description of the methodology used to make this determination.

(B) The manufacturer shall then list the vehicle configurations and acceleration times under high-altitude conditions of all those vehicle configurations which have higher acceleration times under high-altitude conditions than the highest acceleration time at low altitude identified in paragraph (h)(1)(iii)(A) of this section.

(iv) In lieu of performing the test procedure of paragraphs (h)(1)(iii)(A) and (B) of this section, its acceleration time can be estimated based on the manufacturer's engineering evaluation, in accordance with good engineering practice, to meet the exemption criteria of paragraph (h)(1)(iii) of this section.

(2) A vehicle shall only be considered eligible for exemption under this paragraph if at least one configuration of its model type (and transmission configuration in the case of vehicles equipped with manual transmissions, excluding differences due to the presence of overdrive) is certified to meet emission standards under high-altitude conditions as specified in paragraph (a) through (g) of this section. The Certificate of Conformity (the Certificate) covering any exempted configuration(s) will also apply to the corresponding non-exempt configuration(s) required under this subparagraph. As a condition to the exemption, any suspension, revocation, voiding, or withdrawal of the Certificate as it applies to a non-exempt configuration for any reason will result in a suspension of the Certificate as it applies to the corresponding exempted configuration(s) of that model type, unless there is at least one other corresponding non-exempt configuration of the same model type still covered by the Certificate. The suspension of the Certificate as it applies to the exempted configuration(s) will be terminated when any one of the following occurs:

- (i) Another corresponding non-exempt configuration(s) receive(s) coverage under the Certificate; or
- (ii) Suspension of the Certificate as it applies to the corresponding non-exempt configuration(s) is terminated; or
- (iii) The Agency's action(s), with respect to suspension, revocation, voiding or withdrawal of the Certificate as

it applies to the corresponding non-exempt configuration(s), is reversed.

(3) The sale of a vehicle for principal use at a designated high-altitude location that has been exempted as set forth in paragraph (h) of this section will be considered a violation of Section 203(a)(1) of the Clean Air Act.

(i)(1) The manufacturers may exempt 1990 and later model year vehicles from compliance at low altitude with the emission standards set forth in paragraphs (a) and (b) of this section if the vehicles:

(i) Are not intended for sale at low altitude; and

(ii) Are equipped with a unique, high-altitude axle ratio (rear-wheel drive vehicles) or a unique, high-altitude drivetrain (front-wheel drive vehicles) with a higher N/V ratio than other configurations of that model type which are certified in compliance with the emission standards of paragraphs (a) and (b) of this section under low-altitude conditions.

(2) The sale of a vehicle for principal use at low altitude that has been exempted as set forth in paragraph (h)(1) of this section will be considered a violation of section 203(a)(1) of the Clean Air Act.

[54 FR 14461, Apr. 11, 1989]

§ 86.090-9 Emission standards for 1990 and later model year light-duty trucks.

(a)(1) The standards set forth in paragraphs (a) through (c) of this section shall apply to light-duty trucks sold for principal use at other than a designated high-altitude location. Exhaust emissions from 1990 and later model year light-duty trucks shall not exceed (compliance with these standards is optional for 1990 model year methanol-fueled vehicles):

(i)(A) *Hydrocarbons (for petroleum-fueled Otto-cycle and diesel light-duty trucks)*. 0.80 gram per vehicle mile (0.50 gram per vehicle kilometer).

(B) *Total Hydrocarbon Equivalent (for methanol-fueled Otto-cycle and diesel light-duty trucks)*. 0.80 gram per vehicle mile (0.50 gram per vehicle kilometer).

(ii) *Carbon monoxide*. (A) 10 grams per vehicle mile (6.2 grams per vehicle kilometer).