

## Environmental Protection Agency

## § 86.1803-01

the increase in sales is solely the result of the manufacturer's expansion in vehicle production, the manufacturer shall comply with the emission standards described in § 86.1818-12 paragraphs (c) through (e), as applicable, beginning with the second model year after the last year of the three consecutive model years.

(iii) If a manufacturer's average sales for three consecutive model years exceeds 49,999, the manufacturer shall comply with the emission standards described in § 86.1818-12 paragraphs (c) through (e), as applicable, beginning with the first model year after the last year of the three consecutive model years.

(3) *Requesting the conditional exemption from standards.* To be exempted from the standards described in § 86.1818-12(c) through (e), the manufacturer must submit a declaration to EPA containing a detailed written description of how the manufacturer qualifies under the provisions of this paragraph (k). The declaration must describe eligibility information that includes the following: model year 2008 and 2009 sales, sales volumes for each of the most recent three model years, detailed information regarding ownership relationships with other manufacturers, details regarding the application of the provisions of § 86.1838-01(b)(3) regarding the aggregation of sales of related companies, and documentation of good-faith efforts made by the manufacturer to purchase credits from other manufacturers. This declaration must be signed by a chief officer of the company, and must be made prior to each model year for which the exemption is requested. The declaration must be submitted to EPA at least 30 days prior to the introduction into commerce of any vehicles for each model year for which the exemption is requested, but not later than December of the calendar year prior to the model year for which exemption is requested. A conditional exemption will be granted when EPA approves the exemption declaration. The declaration must be sent to the Environmental Protection Agency at the following address: Director, Compliance and Innovative Strategies Division, U.S. Environmental Protec-

tion Agency, 2000 Traverwood Drive, Ann Arbor, Michigan 48105.

[75 FR 25682, May 7, 2010, as amended at 76 FR 19873, Apr. 8, 2011; 77 FR 63155, Oct. 15, 2012; 79 FR 23706, Apr. 28, 2014; 80 FR 9104, Feb. 19, 2015]

### § 86.1802-01 Section numbering; construction.

(a) *Section numbering.* The model year of initial applicability is indicated by the section number. The two digits following the hyphen designate the first model year for which a section is applicable. The section continues to apply to subsequent model years unless a later model year section is adopted. Example: Section 86.18xx-01 applies to the 2001 and subsequent model years. If a § 86.18xx-03 is promulgated it would apply beginning with the 2003 model year; § 86.18xx-01 would apply to model years 2001 through 2002.

(b) A section reference without a model year suffix refers to the section applicable for the appropriate model year.

### § 86.1803-01 Definitions.

The following definitions apply to this subpart:

*505 Cycle* means the test cycle that consists of the first 505 seconds (seconds 1 to 505) of the EPA Urban Dynamometer Driving Schedule, described in § 86.115-00 and listed in appendix I, paragraph (a), of this part.

*866 Cycle* means the test cycle that consists of the last 866 seconds (seconds 506 to 1372) of the EPA Urban Dynamometer Driving Schedule, described in § 86.115-00 and listed in appendix I, paragraph (a), of this part.

*Abnormally treated vehicle* means any diesel light-duty vehicle or diesel light-duty truck that is operated for less than five miles in a 30 day period immediately prior to conducting a particulate emissions test.

*AC1* means a test procedure as described in § 86.162-00 which simulates testing with air conditioning operating in an environmental test cell by adding the air conditioning compressor load to the normal dynamometer forces.

*AC2* means a test procedure as described in § 86.162-00 which simulates testing with air conditioning operating in an environmental test cell by adding

a heat load to the passenger compartment.

*Accuracy* means the difference between a measurement and true value.

*Act* means Part A of Title II of the Clean Air Act as amended, 42 U.S.C., 7401, *et seq.*

*Adjusted Loaded Vehicle Weight* means the numerical average of vehicle curb weight and gross vehicle weight rating (GVWR).

*Administrator* means the Administrator of the Environmental Protection Agency or his/her authorized representative.

*Air Conditioning Idle Test* means the test procedure specified in § 86.165-12.

*Air conditioning system* means a unique combination of air conditioning and climate control components, including: compressor type (*e.g.*, belt, gear, or electric-driven, or a combination of compressor drive mechanisms); compressor refrigerant capacity; the number and type of rigid pipe and flexible hose connections; the number of high side service ports; the number of low side service ports; the number of switches, transducers, and expansion valves; the number of TXV refrigerant control devices; the number and type of heat exchangers, mufflers, receiver/dryers, and accumulators; and the length and type of flexible hose (*e.g.*, rubber, standard barrier or veneer, ultra-low permeation).

*Alternative fuels* means any fuel other than gasoline and diesel fuels, such as methanol, ethanol, and gaseous fuels.

*Ambulance* means a vehicle used for emergency medical care that provides all of the following:

- (1) A driver's compartment.
- (2) A patient compartment to accommodate an emergency medical services provider and one patient located on the primary cot so positioned that the primary patient can be given intensive life-support during transit.
- (3) Equipment and supplies for emergency care at the scene as well as during transport.
- (4) Safety, comfort, and avoidance of aggravation of the patient's injury or illness.
- (5) Two-way radio communication.
- (6) Audible and visual traffic warning devices.

*Approach angle* means the smallest angle in a plan side view of an automobile, formed by the level surface on which the automobile is standing and a line tangent to the front tire static loaded radius arc and touching the underside of the automobile forward of the front tire.

*As-received condition* means the condition of an in-use vehicle procured for emission testing required by this subpart upon which no adjustments, maintenance, or component replacement has occurred subsequent to the vehicle's last routine operation by the vehicle's owner, lessee, or operator prior to procurement.

*Auxiliary Emission Control Device* (AECD) means any element of design which senses temperature, vehicle speed, engine RPM, transmission gear, manifold vacuum, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system.

*Averaging for chassis-bases heavy-duty vehicles* means the exchange of NO<sub>x</sub> emission credits among test groups within a given manufacturer's product line.

*Averaging set* means a category or subcategory of vehicles within which test groups can average and trade emission credits with one another.

*Axle clearance* means the vertical distance from the level surface on which an automobile is standing to the lowest point on the axle differential of the automobile.

*Banking* means one of the following:

- (1) The retention of NO<sub>x</sub> emission credits for complete heavy-duty vehicles by the manufacturer generating the emission credits, for use in future model year certification programs as permitted by regulation.
- (2) The retention of cold temperature non-methane hydrocarbon (NMHC) emission credits for light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles by the manufacturer generating the emission credits, for use in future model year certification programs as permitted by regulation.
- (3) The retention of NO<sub>x</sub> emission credits for light-duty vehicles, light-

duty trucks, and medium-duty passenger vehicles for use in future model year certification programs as permitted by regulation.

(4) The retention of CO<sub>2</sub> emission credits for light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles for use in future model year certification programs as permitted by regulation.

*Base level* has the meaning given in § 600.002-08 of this chapter.

*Base tire* has the meaning given in § 600.002-08 of this chapter.

*Base vehicle* has the meaning given in § 600.002-08 of this chapter.

*Basic engine* has the meaning given in § 600.002-08 of this chapter.

*Basic vehicle frontal area* means the area enclosed by the geometric projection of the basic vehicle along the longitudinal axis, which includes tires but excludes mirrors and air deflectors, onto a plane perpendicular to the longitudinal axis of the vehicle.

*Bi-directional control* means the capability of a diagnostic tool to send messages on the data bus that temporarily overrides the module's control over a sensor or actuator and gives control to the diagnostic tool operator. Bi-directional controls do not create permanent changes to engine or component calibrations.

*Bin* or *emission bin* means a set of emission standards applicable to exhaust pollutants measured on the Federal Test Procedure (FTP). A bin is equivalent to a horizontal row of FTP standards in Tables S04-1 and S04-2 shown in this subpart. Manufacturers are generally free to choose the bin of standards that will apply to a certain test group of vehicles, provided that on a sales weighted average of those bins, all of their vehicles meet a specified fleet average standard for a particular pollutant.

*Body style* means a level of commonality in vehicle construction as defined by number of doors and roof treatment (e.g., sedan, convertible, fastback, hatchback).

*Body type* means a name denoting a group of vehicles that are either in the same car line or in different car lines provided the only reason the vehicles qualify to be considered in different car lines is that they are produced by a

separate division of a single manufacturer.

*Breakover angle* means the supplement of the largest angle, in the plan side view of an automobile, that can be formed by two lines tangent to the front and rear static loaded radii arcs and intersecting at a point on the underside of the automobile.

*Calibration* means the set of specifications, including tolerances, unique to a particular design, version, or application of a component or components assembly capable of functionally describing its operation over its working range.

*Calibration gas* means a gas of known concentration which is used to establish the response curve of an analyzer.

*CalLEV II* or *California LEV II* refers to California's second phase of its low emission vehicle (LEV) program. This program was adopted at the hearing of the California Air Resources Board held on November 5, 1998 and became effective on November 27, 1999.

*Candidate in-use vehicle* means an in-use vehicle which would be eligible to participate in the in-use verification program in accordance with § 86.1845-01.

*Carbon-related exhaust emissions (CREE)* has the meaning given in § 600.002-08 of this chapter.

*Car line* means a name denoting a group of vehicles within a make or car division which has a degree of commonality in construction (e.g., body, chassis). Car line does not consider any level of decor or opulence and is not generally distinguished by characteristics as roofline, number of doors, seats, or windows except for station wagons or light-duty trucks. Station wagons, light-duty trucks, and complete heavy-duty vehicles are considered to be different car lines than passenger cars.

*Class 2b* means relating to heavy-duty vehicles at or below 10,000 pounds GVWR.

*Class 3* means relating to heavy-duty vehicles above 10,000 pounds GVWR and at or below 14,000 pounds GVWR.

*Combined CO<sub>2</sub>* means the CO<sub>2</sub> value determined for a vehicle (or vehicles) by averaging the city and highway CO<sub>2</sub> values, weighted 0.55 and 0.45 respectively.

*Combined CREE* means the CREE value determined for a vehicle (or vehicles) by averaging the city and highway fuel CREE values, weighted 0.55 and 0.45 respectively.

*Configuration* means a subclassification within a test group which is based on engine code, inertia weight class, transmission type and gear ratios, final drive ratio, and other parameters which may be designated by the Administrator.

*Conveniently available service facility and spare parts for small-volume manufacturers* means that the vehicle manufacturer has a qualified service facility at or near the authorized point of sale or delivery of its vehicles and maintains an inventory of all emission-related spare parts or has made arrangements for the part manufacturers to supply the parts by expedited shipment (e.g., utilizing overnight express delivery service, UPS, etc.).

*Crankcase emissions* means airborne substances emitted to the atmosphere from any portion of the engine crankcase ventilation or lubrication systems.

*Critical emission-related components* are those components which are designed primarily for emission control, or whose failure may result in a significant increase in emissions accompanied by no significant impairment (or perhaps even an improvement) in performance, driveability, and/or fuel economy as determined by the Administrator.

*Critical emission-related maintenance* means that maintenance to be performed on critical emission-related components.

*Curb weight* means the actual or the manufacturer's estimated weight of the vehicle in operational status with all standard equipment, and weight of fuel at nominal tank capacity, and the weight of optional equipment computed in accordance with § 86.1832-01; incomplete light-duty trucks shall have the curb weight specified by the manufacturer.

*Curb-idle* means, for manual transmission code motor vehicles, the engine speed with the transmission in neutral or with the clutch disengaged and with the air conditioning system, if present, turned off. For automatic

transmission code motor vehicles, curb-idle means the engine speed with the automatic transmission in the park position (or neutral position if there is no park position), and with the air conditioning system, if present, turned off.

*Data stream information* means information (i.e., messages and parameters) originated within the vehicle by a module or intelligent sensors (i.e., a sensor that contains and is controlled by its own module) and transmitted between a network of modules and/or intelligent sensors connected in parallel with either one or two communication wires. The information is broadcast over the communication wires for use by other modules (e.g., chassis, transmission, etc.) to conduct normal vehicle operation or for use by diagnostic tools. Data stream information does not include engine calibration related information.

*Dedicated vehicle* means any motor vehicle engineered and designed to be operated using a single fuel. Flexible fuel vehicles and multi-fuel vehicles are not dedicated vehicles.

*Defeat device* means an auxiliary emission control device (AECD) that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal vehicle operation and use, unless:

(1) Such conditions are substantially included in the Federal emission test procedure;

(2) The need for the AECD is justified in terms of protecting the vehicle against damage or accident;

(3) The AECD does not go beyond the requirements of engine starting; or

(4) The AECD applies only for *emergency vehicles* and the need is justified in terms of preventing the vehicle from losing speed, torque, or power due to abnormal conditions of the emission control system, or in terms of preventing such abnormal conditions from occurring, during operation related to emergency response. Examples of such abnormal conditions may include excessive exhaust backpressure from an overloaded particulate trap, and running out of diesel exhaust fluid for engines that rely on urea-based selective catalytic reduction.

*Departure angle* means the smallest angle, in a plan side view of a motor vehicle, formed by the level surface on which the motor vehicle is standing and a line tangent to the rear tire static loaded radius arc and touching the underside of the motor vehicle rearward of the rear tire.

*Diesel* means a type of engine with operating characteristics significantly similar to the theoretical Diesel combustion cycle. The non-use of a throttle during normal operation is indicative of a diesel engine.

*Diesel exhaust fluid (DEF)* means a liquid reducing agent (other than the engine fuel) used in conjunction with selective catalytic reduction to reduce NO<sub>x</sub> emissions. *Diesel exhaust fluid* is generally understood to be an aqueous solution of urea conforming to the specifications of ISO 22241.

*Dispensed fuel temperature* means the temperature (deg. F or deg. C may be used) of the fuel being dispensed into the tank of the test vehicle during a refueling test.

*Diurnal breathing losses* means diurnal emissions.

*Diurnal emissions* means evaporative emissions resulting from the daily cycling of ambient temperatures.

*Drive train configuration* means a unique combination of engine code, transmission configuration, and axle ratio.

*Dual fuel vehicle* means any motor vehicle engineered and designed to be operated on two different fuels, but not on a mixture of the fuels.

*Durability data vehicle* means a vehicle used to generate durability data as required in this subpart.

*Durability group* means the basic classification unit of a manufacturer's product line used for the purpose of selecting a vehicle configuration to demonstrate durability and predict deterioration in accordance with § 86.1822-01.

*Durability useful life* means the highest useful life mileage out of the set of all useful life mileages that apply to a given vehicle. The durability useful life determines the duration of service accumulation on a durability data vehicle. The determination of durability useful life shall reflect any light-duty truck or complete heavy-duty vehicle alternative useful life periods approved

by the Administrator under § 86.1805-01(c). The determination of durability useful life shall exclude any standard and related useful life mileage for which the manufacturer has obtained a waiver of emission data submission requirements under § 86.1829-01.

*Electric vehicle* means a motor vehicle that is powered solely by an electric motor drawing current from a rechargeable energy storage system, such as from storage batteries or other portable electrical energy storage devices, including hydrogen fuel cells, provided that:

(1) The vehicle is capable of drawing recharge energy from a source off the vehicle, such as residential electric service; and

(2) The vehicle must be certified to the emission standards of Bin #1 of Table S04-1 in § 86.1811-09(c)(6).

(3) The vehicle does not have an on-board combustion engine/generator system as a means of providing electrical energy.

*Element of design* means any control system (i.e., computer software, electronic control system, emission control system, computer logic), and/or control system calibrations, and/or the results of systems interaction, and/or hardware items on a motor vehicle or motor vehicle engine.

*Emergency vehicle* means one of the following:

(1) For the greenhouse gas emission standards in § 86.1818, *emergency vehicle* means a motor vehicle manufactured primarily for use as an ambulance or combination ambulance-hearse or for use by the United States Government or a State or local government for law enforcement.

(2) For the OBD requirements in § 86.1806, *emergency vehicle* means a motor vehicle manufactured primarily for use in medical response or for use by the U.S. Government or a State or local government for law enforcement or fire protection.

(3) For other provisions under this subpart, *emergency vehicle* means a motor vehicle that is either—

(i) An ambulance or a fire truck; or  
(ii) A vehicle that we have determined will likely be used in emergency

situations where emission control function or malfunction may cause a significant risk to human life. For example, we would consider a pickup truck that is certain to be retrofitted with a slip-on firefighting module to be an emergency vehicle, even though it was not initially designed to be a fire truck. Also, a mobile command center that is unable to manually regenerate its DPF while on duty could be an emergency vehicle. In making this determination, we may consider any factor that has an effect on the totality of the actual risk to human life. For example, we may consider how frequently a vehicle will be used in emergency situations or how likely it is that the emission controls will cause a significant risk to human life when the vehicle is used in emergency situations. We would not consider the pickup truck in the example above to be an emergency vehicle if there is merely a possibility (rather than a certainty) that the vehicle will be retrofitted with a slip-on firefighting module.

*Emission control system* is a unique group of emission control devices, auxiliary emission control devices, engine modifications and strategies, and other elements of design designated by the Administrator used to control exhaust emissions of a vehicle.

*Emission credits* mean the amount of emission reductions or exceedances, by a complete heavy-duty vehicle test group, below or above the emission standard, respectively. Emission credits below the standard are considered as "positive credits," while emission credits above the standard are considered as "negative credits." In addition, "projected credits" refer to emission credits based on the projected U.S. production volume of the test group. "Reserved credits" are emission credits generated within a model year waiting to be reported to EPA at the end of the model year. "Actual credits" refer to emission credits based on actual U.S. production volumes as contained in the end-of-year reports submitted to EPA. Some or all of these credits may be revoked if EPA review of the end of year reports or any subsequent audit actions uncover problems or errors.

*Emission-related component* means any component which can affect emissions.

*Emission-related maintenance* means that maintenance which does substantially affect emissions or which is likely to affect the emissions deterioration of the vehicle during normal in-use operation, even if the maintenance is performed at some time other than that which is recommended.

*Engine code* means a unique combination within a test group of displacement, fuel injection (or carburetor) calibration, choke calibration, distributor calibration, auxiliary emission control devices, and other engine and emission control system components specified by the Administrator. For electric vehicles, engine code means a unique combination of manufacturer, electric traction motor, motor configuration, motor controller, and energy storage device.

*Engine warm-up cycle* means sufficient vehicle operation such that the coolant temperature has risen by at least 40 deg. F from engine starting and reaches a minimum temperature of 160 deg. F.

*Environmental test cell* means a test cell capable of wind-speed, solar thermal load, ambient temperature, and humidity control or simulation which meets the requirements of § 86.161-00 for running emission tests with the air conditioning operating.

*EPA Enforcement Officer* means any officer or employee of the Environmental Protection Agency so designated in writing by the Administrator (or by his/her designee).

*Equivalent test weight* means the weight, within an inertia weight class, which is used in the dynamometer testing of a vehicle and which is based on its loaded vehicle weight or adjusted loaded vehicle weight in accordance with the provisions of this part.

*Ethanol-fueled vehicle* means any motor vehicle or motor vehicle engine that is engineered and designed to be operated using ethanol fuel (*i.e.*, a fuel that contains at least 50 percent ethanol (C<sub>2</sub>H<sub>5</sub>OH) by volume) as fuel.

*Evaporative emissions* means hydrocarbons emitted into the atmosphere from a motor vehicle, other than exhaust and crankcase emissions.

*Evaporative/refueling control system* means a unique combination within an

evaporative/refueling family of canister adsorptive material, purge system configuration, purge strategy, and other parameters determined by the Administrator to affect evaporative and refueling emission control system durability or deterioration factors.

*Evaporative/refueling emission code* means a unique combination, in an evaporative/refueling family-evaporative emission control system combination, of purge system calibrations, fuel tank and carburetor bowl vent calibrations and other fuel system and evaporative emission control system components and calibrations specified by the Administrator.

*Evaporative/refueling family* means the basic classification unit of a manufacturer's product line used for the purpose of evaporative and refueling emissions test fleet selection and determined in accordance with § 86.1821-01.

*Evaporative/refueling vehicle configuration* means a unique combination of basic engine, engine code, body type, and evaporative emission code.

*Exhaust emissions* means substances emitted to the atmosphere from any opening downstream from the exhaust port of a motor vehicle engine.

*Exhaust gas recirculation valve* means a device which directs a portion of the exhaust gas into the intake air stream for the purpose of controlling emissions.

*Family emission limit (FEL)* means a bin standard or emission level selected by the manufacturer that serves as the applicable emission standard for the vehicles in the family or test group in the context of fleet-average standards or emission credits.

*Federal Test Procedure*, or FTP means the test procedure as described in § 86.130-00(a) through (d) and (f) which is designed to measure urban driving tail pipe exhaust emissions and evaporative emissions over the Urban Dynamometer Driving Schedule as described in appendix I to this part.

*Fire truck* means a vehicle designed to be used under emergency conditions to transport personnel and equipment and to support the suppression of fires and mitigation of other hazardous situations.

*Fixed liquid level gauge* means a type of liquid level gauge used on liquefied

petroleum gas-fueled vehicles which uses a relatively small positive shutoff valve and is designed to indicate when the liquid level in the fuel tank being filled reaches the proper fill level. The venting of fuel vapor and/or liquid fuel to the atmosphere during the refueling event is generally associated with the use of the fixed liquid level gauge.

*Fleet average cold temperature NMHC standard* means, for light-duty vehicles, light-duty trucks and medium-duty passenger vehicles, an NMHC cold temperature standard imposed over an individual manufacturer's total 50-State U.S. sales (or a fraction of total U.S. sales during phase-in years), as "U.S. sales" is defined to include all national sales, including points-of-first sale in California, of a given model year. Manufacturers determine their compliance with such a standard by averaging, on a sales-weighted basis, the individual NMHC "Family Emission Limits" (FEL—as defined in this subpart) to which light-duty vehicles, light-duty trucks and medium-duty passenger vehicles were certified and sold for that model year.

*Fleet average NO<sub>x</sub> standard* means, for light-duty vehicles, light-duty trucks and medium-duty passenger vehicles, a NO<sub>x</sub> standard imposed over an individual manufacturer's total U.S. sales (or a fraction of total U.S. sales during phase-in years), as 'U.S. sales' is defined in this subpart, of a given model year. Manufacturers determine their compliance with such a standard by averaging, on a sales weighted basis, the individual NO<sub>x</sub> standards they choose for the fleet of light-duty vehicles, light-duty trucks and medium-duty passenger vehicles they sell of that model year.

*Flexible fuel vehicle* means any motor vehicle engineered and designed to be operated on a petroleum fuel and on a methanol or ethanol fuel, or any mixture of the petroleum fuel and methanol or ethanol. Methanol-fueled and ethanol-fueled vehicles that are only marginally functional when using gasoline (*e.g.*, the engine has a drop in rated horsepower of more than 80 percent) are not flexible fuel vehicles.

*Footprint* is the product of average track width (rounded to the nearest

tenth of an inch) and wheelbase (measured in inches and rounded to the nearest tenth of an inch), divided by 144 and then rounded to the nearest tenth of a square foot, where the average track width is the average of the front and rear track widths, where each is measured in inches and rounded to the nearest tenth of an inch.

*Fuel cell vehicle* means an electric vehicle propelled solely by an electric motor where energy for the motor is supplied by an electrochemical cell that produces electricity via the non-combustion reaction of a consumable fuel, typically hydrogen.

*Fuel system* means the combination of fuel tank(s), fuel pump, fuel lines, and carburetor or fuel injection components, and includes all fuel system vents and fuel evaporative emission control system components.

*Full size pickup truck* means a light truck which has a passenger compartment and an open cargo box and which meets the following specifications:

(1) A minimum cargo bed width between the wheelhouses of 48 inches, measured as the minimum lateral distance between the limiting interferences (pass-through) of the wheelhouses. The measurement shall exclude the transitional arc, local protrusions, and depressions or pockets, if present. An open cargo box means a vehicle where the cargo box does not have a permanent roof or cover. Vehicles produced with detachable covers are considered "open" for the purposes of these criteria.

(2) A minimum open cargo box length of 60 inches, where the length is defined by the lesser of the pickup bed length at the top of the body or the pickup bed length at the floor, where the length at the top of the body is defined as the longitudinal distance from the inside front of the pickup bed to the inside of the closed endgate as measured at the height of the top of the open pickup bed along vehicle centerline, and the length at the floor is defined as the longitudinal distance from the inside front of the pickup bed to the inside of the closed endgate as measured at the cargo floor surface along vehicle centerline.

(3)(i) A minimum towing capability of 5,000 pounds, where minimum towing

capability is determined by subtracting the gross vehicle weight rating from the gross combined weight rating; or

(ii) A minimum payload capability of 1,700 pounds, where minimum payload capability is determined by subtracting the curb weight from the gross vehicle weight rating.

*Gaseous fuel* means natural gas or liquefied petroleum gas.

*Good engineering judgment* has the meaning given in 40 CFR 1068.30. See 40 CFR 1068.5 for the administrative process we use to evaluate good engineering judgment.

*Gross combination weight rating (GCWR)* means the value specified by the vehicle manufacturer as the maximum weight of a loaded vehicle and trailer, consistent with good engineering judgment.

*Gross vehicle weight* means the manufacturer's gross weight rating for the individual vehicle.

*Gross vehicle weight rating (GVWR)* means the value specified by the manufacturer as the maximum design loaded weight of a single vehicle, consistent with good engineering judgment.

*Hang-up* refers to the process of hydrocarbon molecules being adsorbed, condensed, or by any other method removed from the sample flow prior to reaching the instrument detector. It also refers to any subsequent desorption of the molecules into the sample flow when they are assumed to be absent.

*Heating degree day* means the number of degrees per day the daily average temperature is below 65 degrees Fahrenheit. The daily average temperature is the mean of the maximum and minimum temperature for a 24-hour period. The annual heating degree day value is derived by summing the daily heating degree days over a calendar year period.

*Heavy light-duty truck* means any light-duty truck rated greater than 6000 lbs GVWR. The LDT3 and LDT4 classifications comprise the heavy light-duty truck category.

*Heavy-duty engine* means any engine which the engine manufacturer could reasonably expect to be used for motive power in a heavy-duty vehicle.

*Heavy-duty vehicle* means any motor vehicle rated at more than 8,500 pounds

GVWR or that has a vehicle curb weight of more than 6,000 pounds or that has a basic vehicle frontal area in excess of 45 square feet. Note that MDPVs are heavy-duty vehicles that are in many cases subject to requirements that apply for light-duty trucks.

*High altitude* means any elevation over 1,219 meters (4,000 feet).

*High-altitude conditions* means a test altitude of 1,620 meters (5,315 feet), plus or minus 100 meters (328 feet), or equivalent observed barometric test conditions of 83.3 kPa (24.2 inches Hg) plus or minus 1 kPa (0.30 Hg).

*Highway Fuel Economy Test Procedure (HFET)* has the meaning given in § 600.002-08 of this chapter.

*Hot-soak emissions* and *Hot-soak losses* means evaporative emissions after termination of engine operation.

*Hybrid electric vehicle (HEV)* means a motor vehicle which draws propulsion energy from onboard sources of stored energy that are both an internal combustion engine or heat engine using consumable fuel, and a rechargeable energy storage system such as a battery, capacitor, hydraulic accumulator, or flywheel. This includes plug-in hybrid electric vehicles.

*Indirect information* means any information that is not specifically contained in the service literature, but is contained in items such as tools or equipment provided to franchised dealers (or others).

*Inertia weight class* means the class, which is a group of equivalent test weights, into which a vehicle is grouped based on its test weight basis in accordance with the provisions of this part 86.

*Integrated refueling emission control system* means a system where vapors resulting from refueling are stored in a common vapor storage unit(s) with other evaporative emissions of the vehicle and are purged through a common purge system.

*Interim non-Tier 2 vehicle, interim non-Tier 2 LDV/LLDT, interim non-Tier 2 HLDT/MDPV, or interim vehicle* refer to 2004 or later model year light-duty vehicles, light-duty trucks or MDPVs, or a specific combination thereof, not certified to Tier 2 FTP exhaust emission standards during the Tier 2 phase-in period. Model year 2004 HLDTs belong-

ing to test groups whose model year commences before December 21, 2003, are not interim non-Tier 2 HLDTs unless their manufacturer chooses to comply with the interim requirements applicable to HLDTs for all of its 2004 model year HLDTs as permitted in this subpart. Similarly 2004 model year heavy-duty vehicles whose model year commences before December 21, 2003, are not interim non-Tier 2 MDPVs unless their manufacturer chooses to comply with the interim requirements applicable to MDPVs for all of its 2004 model year MDPVs as permitted in this subpart. The terms *interim non-Tier 2 vehicle, interim non-Tier 2 LDV, interim non-Tier 2 LDT, interim non-Tier 2 HLDT, interim non-Tier 2 MDPV*, etc. have the same meaning without the words "non-Tier 2".

*Interior volume index* has the meaning given in § 600.315-08 of this chapter.

*Intermediary* means any individual or entity, other than a manufacturer, which provides service or equipment to automotive technicians.

*Intermediate temperature cold testing* means testing done pursuant to the driving cycle and testing conditions contained in subpart C of this part, at temperatures between 25 deg. F (-4 deg. C) and 68 deg. F (20 deg. C).

*In-use vehicle* means a customer owned and operated vehicle which is not under the control of the manufacturer, dealerships or their agents. Leased vehicles will be considered in-use vehicles for the purpose of this subpart if the vehicles meet the criteria specified in § 86.1845-01.

*In-use verification program (IUV)* means the testing program conducted by manufacturers which gathers in-use emission data in accordance with § 86.1848-01.

*LDV/T* means light-duty vehicles and light-duty trucks collectively, without regard to category.

*LEV III* means relating to the LEV III emission standards in Title 13, §§ 1961.2 and 1976 of the California Code of Regulations, as adopted by the California Air Resources Board (incorporated by reference in § 86.1).

*Light light-duty truck* means any light-duty truck rated up through 6000

lbs GVWR. The LDT1 and LDT2 classifications compose the light light-duty truck category.

*Light-duty truck* means any motor vehicle rated at 8,500 pounds GVWR or less which has a curb weight of 6,000 pounds or less and which has a basic vehicle frontal area of 45 square feet or less, which is:

- (1) Designed primarily for purposes of transportation of property or is a derivative of such a vehicle; or
- (2) Designed primarily for transportation of persons and has a capacity of more than 12 persons; or
- (3) Available with special features enabling off-street or off-highway operation and use.

*Light-duty truck 1* (LDT1) means any light light-duty truck up through 3750 lbs loaded vehicle weight.

*Light-duty truck 2* (LDT2) means any light light-duty truck greater than 3750 lbs loaded vehicle weight.

*Light-duty truck 3* (LDT3) means any heavy light-duty truck up through 5750 lbs adjusted loaded vehicle weight.

*Light-duty truck 4* (LDT4) means any heavy light-duty truck greater than 5750 lbs adjusted loaded vehicle weight.

*Light-duty vehicle* means a passenger car or passenger car derivative capable of seating 12 passengers or less.

*Liquefied petroleum gas* means a liquid hydrocarbon fuel that is stored under pressure and is composed primarily of species that are gases at atmospheric conditions (temperature = 25 deg. C and pressure = 1 atm), excluding natural gas.

*Loaded vehicle weight* means the vehicle's curb weight plus 300 pounds.

*Low altitude* means any elevation equal to or less than 1,219 meters (4,000 feet).

*Low-altitude conditions* means a test altitude less than 549 meters (1,800 feet).

*Malfunction* means not operating according to specifications (e.g., those specifications listed in the certification application).

*Medium-duty passenger vehicle (MDPV)* means any heavy-duty vehicle (as defined in this subpart) with a gross vehicle weight rating (GVWR) of less than 10,000 pounds that is designed primarily for the transportation of persons. The

MDPV definition does not include any vehicle which:

- (1) Is an "incomplete truck" as defined in this subpart; or
- (2) Has a seating capacity of more than 12 persons; or
- (3) Is designed for more than 9 persons in seating rearward of the driver's seat; or
- (4) Is equipped with an open cargo area (for example, a pick-up truck box or bed) of 72.0 inches in interior length or more. A covered box not readily accessible from the passenger compartment will be considered an open cargo area for purposes of this definition.

*Methanol-fueled vehicle* means any motor vehicle or motor vehicle engine that is engineered and designed to be operated using methanol fuel (i.e., a fuel that contains at least 50 percent methanol (CH<sub>3</sub>OH) by volume) as fuel. Model means a specific combination of car line, body style, and drivetrain configuration.

*Mild hybrid electric vehicle* means a hybrid electric vehicle that has start/stop capability and regenerative braking capability, where the recovered energy over the Federal Test Procedure is at least 15 percent but less than 65 percent of the total braking energy, as measured and calculated according to § 600.116-12(c).

*Model type* has the meaning given in § 600.002-08 of this chapter.

*Model year* means the manufacturer's annual production period (as determined by the Administrator) which includes January 1 of such calendar year: Provided that if the manufacturer has no annual production period, the term "model year" shall mean the calendar year.

*Motor vehicle* has the meaning given in § 85.1703 of this chapter.

*Multi-fuel* means capable of operating on two or more different fuel types, either separately or simultaneously.

*Multi-fuel vehicle* means any motor vehicle capable of operating on two or more different fuel types, either separately or simultaneously.

*Natural gas* means a fuel whose primary constituent is methane.

*Nominal fuel tank capacity* means the volume of the fuel tank(s), specified by the manufacturer to the nearest tenth of a U.S. gallon, which may be filled

with fuel from the fuel tank filler inlet.

*Non-emission-related maintenance* means that maintenance which does not substantially affect emissions and which does not have a lasting effect on the emissions deterioration of the vehicle or engine during normal in-use operation once the maintenance is performed.

*Non-integrated refueling emission control system* means a system where fuel vapors from refueling are stored in a vapor storage unit assigned solely to the function of storing refueling vapors.

*Non-Methane Hydrocarbon Equivalent* means the sum of the carbon mass emissions of non-oxygenated non-methane hydrocarbons, methanol, formaldehyde, or other organic compounds that are separately measured, expressed as gasoline-fueled vehicle hydrocarbons. In the case of exhaust emissions, the hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1. In the case of diurnal and hot soak emissions, the hydrogen-to-carbon ratios of the equivalent hydrocarbons are 2.33:1 and 2.2:1, respectively.

*Non-methane organic gases (NMOG)* means the sum of oxygenated and non-oxygenated hydrocarbons contained in a gas sample as measured using the procedures described in 40 CFR 1066.635.

*Non-oxygenated hydrocarbon* means organic emissions measured by a flame ionization detector, excluding methanol.

*N/V* means the ratio of engine speed in revolutions per minute (rpm) to vehicle speed in miles per hour in the top transmission gear. 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.

*Option*, in the context of a vehicle design feature, means any available equipment or feature not standard equipment on a model.

*Original Equipment Manufacturer (OEM)* means the manufacturer responsible for the design and production of a vehicle or component. This manufacturer will be fully knowledgeable of any production changes made to the design of the vehicle or component and

shall be able to track the individual vehicles or component with regard to such production changes.

*Otto-cycle* means type of engine with operating characteristics significantly similar to the theoretical Otto combustion cycle. The use of a throttle during normal operation is indicative of an Otto-cycle engine.

*Oxides of nitrogen* means the sum of the nitric oxide and nitrogen dioxide contained in a gas sample as if the nitric oxide were in the form of nitrogen dioxide.

*Periodically regenerating trap oxidizer system* means a trap oxidizer that utilizes, during normal driving conditions, an automated regeneration mode for cleaning the trap, the operation of which can be easily detected.

*Petroleum equivalency factor* means the value specified in 10 CFR 474.3(b), which incorporates the parameters listed in 49 U.S.C. 32904(a)(2)(B) and is used to calculate petroleum-equivalent fuel economy.

*Petroleum-equivalent fuel economy* means the value, expressed in miles per gallon, that is calculated for an electric vehicle in accordance with 10 CFR 474.3(a), and reported to the Administrator of the Environmental Protection Agency for use in determining the vehicle manufacturer's corporate average fuel economy.

*Petroleum fuel* means liquid fuels normally derived from crude oil, excluding liquefied petroleum gas. Gasoline and diesel fuel are petroleum fuels.

*Petroleum-powered accessory* means a vehicle accessory (*e.g.*, a cabin heater, defroster, and/or air conditioner) that:

- (1) Uses gasoline or diesel fuel as its primary energy source; and
- (2) Meets the requirements for fuel, operation, and emissions in § 88.104-94(g) of this chapter.

*Platform* means a segment of an automobile manufacturer's vehicle fleet in which the vehicles have a degree of commonality in construction (primarily in terms of body and chassis design). Platform does not consider the model name, brand, marketing division, or level of decor or opulence, and is not generally distinguished by such characteristics as powertrain, roof line, number of doors, seats, or windows. A platform may include vehicles from

various fuel economy classes, and may include light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles.

*Plug-in hybrid electric vehicle (PHEV)* means a hybrid electric vehicle that has the capability to charge the battery from an off-vehicle electric source, such that the off-vehicle source cannot be connected to the vehicle while the vehicle is in motion.

*Point of first sale* means the location where the completed vehicle is first purchased. This term is synonymous with final product purchase location. The point of first sale may be a retail customer, dealer, distributor, fleet operator, broker, secondary manufacturer, or any other entity which purchases a vehicle from a manufacturer. In cases where the end user purchases the completed vehicle directly from the manufacturer, the end user is the point of first sale.

*Precision* means the standard deviation of replicated measurements.

*Production volume* has the meaning given in § 600.002-08 of this chapter.

*Proven emission control systems* are emission control components or systems (and fuel metering systems) that have completed full durability testing evaluation over a vehicle's useful life in some other certified test group, or have completed bench or road testing demonstrated to be equal or more severe than certification mileage accumulation requirements. Alternatively, proven components or systems are those that are determined by EPA to be of comparable functional quality and manufactured using comparable materials and production techniques as components or systems which have been durability demonstrated in some other certified test group. In addition, the components or systems must be employed in an operating environment (e.g., temperature, exhaust flow, etc.,) similar to that experienced by the original or comparable components or systems in the original certified test group.

*Rated power* means an engine's maximum power output in an installed configuration, as determined by using SAE J1349 (incorporated by reference in § 86.1).

*Recall program* means the program administered by the Agency under the authority of CAA section 207, and regulations in 40 CFR part 85.

*Reconfigured emission-data vehicle* means an emission-data vehicle obtained by modifying a previously used emission-data vehicle to represent another emission-data vehicle.

*Refueling emissions* means evaporative emissions that emanate from a motor vehicle fuel tank(s) during a refueling operation.

*Refueling emissions canister(s)* means any vapor storage unit(s) that is exposed to the vapors generated during refueling.

*Resting losses* means evaporative emissions that may occur continuously, that are not diurnal emissions, hot soak emissions, refueling emissions, running losses, or spitback emissions.

*Round (rounded, rounding)* has the meaning given in 40 CFR 1065.1001, unless otherwise specified.

*Running change* means a change to a vehicle or addition of a model which occurs after certification but during vehicle production.

*Running losses* means evaporative emissions that occur during vehicle operation.

*SC03* means the test cycle, described in § 86.160-00 and listed in appendix I, paragraph (h), of this part, which is designed to represent driving immediately following startup.

*Scheduled maintenance* means any adjustment, repair, removal, disassembly, cleaning, or replacement of vehicle components or systems which is performed on a periodic basis to prevent part failure or vehicle (if the engine were installed in a vehicle) malfunction, or anticipated as necessary from inspection to correct an overt indication of vehicle malfunction or failure for which periodic maintenance is not appropriate.

*Secondary air injection* means a system whereby air (not ingested by the engine) is introduced into the exhaust system in front of a catalyst.

*Section 177 states* means the states that have adopted California's motor vehicle standards for a particular model year under section 177 of the Clean Air Act (42 U.S.C. 7507).

*Similar emission control systems* are engine, fuel metering and emission control system combinations which use the same fuel (e.g., gasoline, diesel, etc.), combustion cycle (e.g., two or four stroke), general type of fuel system (e.g., carburetor or fuel injection), catalyst system (e.g., none, oxidization, three-way plus oxidization, three-way only, etc.), fuel control system (e.g., feedback or non-feedback), secondary air system (e.g., equipped or not equipped) and exhaust gas recirculation (EGR) (e.g., equipped or not equipped).

*Span gas* means a gas of known concentration which is used routinely to set the output level of an analyzer.

*Special features enabling off-street or off-highway operation and use* means a vehicle that has:

- (1) Four-wheel drive; and
- (2) At least four of the following characteristics calculated when the automobile is at curb weight, on a level surface, with the front wheels parallel to the vehicle's longitudinal centerline, and the tires inflated to the manufacturer's recommended pressure; approach angle of not less than 28 degrees, breakover angle of not less than 14 degrees, departure angle of not less than 20 degrees, running clearance of not less than 8 inches, and front and rear axle clearances of not less than 7 inches each.

*Spitback emissions* means evaporative emissions resulting from the loss of liquid fuel that is emitted from a vehicle during a fueling operation.

*Standard equipment* means those features or equipment which are marketed on a vehicle over which the purchaser can exercise no choice.

*Static loaded radius arc* means a portion of a circle whose center is the center of a standard tire-rim combination of an automobile and whose radius is the distance from that center to the level surface on which the automobile is standing, measured with the automobile at curb weight, the wheel parallel to the vehicle's longitudinal centerline, and the tire inflated to the manufacturer's recommended pressure.

*Strong hybrid electric vehicle* means a hybrid electric vehicle that has start/stop capability and regenerative braking capability, where the recovered en-

ergy over the Federal Test Procedure is at least 65 percent of the total braking energy, as measured and calculated according to § 600.116-12(c).

*Subconfiguration* has the meaning given in § 600.002-08 of this chapter.

*Supplemental FTP* (SFTP) means the additional test procedures designed to measure emissions during aggressive and microtransient driving, as described in § 86.159-00 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 § 86.160-00 over the SC03 cycle.

*Tank fuel volume* means the volume of fuel in the fuel tank(s), which is determined by taking the manufacturer's nominal fuel tank(s) capacity and multiplying by 0.40. The result is rounded to the nearest tenth of a U.S. gallon in accordance with the Rounding-Off Method specified in ASTM E29-93a, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications (incorporated by reference; see § 86.1)

*Test group* means the basic classification unit within a durability group used for the purpose of demonstrating compliance with exhaust emission standards in accordance with § 86.1841-01. The test group is also used as a classification unit for gathering in-use data for the In-Use Verification Program (IUVP) in accordance with § 86.1848-01.

*Test weight basis* means the basis on which equivalent test weight is determined in accordance with § 86.129-00 of subpart B of this part.

*Throttle* means a device used to control an engine's power output by limiting the amount of air entering the combustion chamber.

*Tier 2 HLDT/MDPV* means any heavy light-duty truck or medium-duty passenger vehicle, including HEVs and ZEVs, of the 2008 or later model year certified to comply with the Tier 2 FTP exhaust standards contained in § 86.1811-04 including the 0.07 g/mi fleet average NO<sub>x</sub> standard. The term Tier 2 HLDT/MDPV also includes any heavy light-duty truck or medium-duty passenger vehicle, of any model year,

which is certified to Tier 2 FTP exhaust standards for purposes of generating or banking early NO<sub>x</sub> credits for averaging under Tier 2 requirements, or utilizing alternate phase-in schedules, as allowed in this subpart.

*Tier 2 LDV/LLDT* means any light-duty vehicle or light light-duty truck, including HEVs and ZEVs, of the 2004 or later model year certified to comply with the Tier 2 FTP exhaust standards contained in § 86.1811-04 including the 0.07 g/mi fleet average NO<sub>x</sub> standard. The term Tier 2 LDV/LLDT also includes any light-duty vehicle or light light-duty truck, of any model year, which is certified to Tier 2 FTP exhaust standards for purposes of generating or banking early NO<sub>x</sub> credits for averaging under Tier 2 requirements, or utilizing alternate phase-in schedules as allowed in this subpart.

*Tier 2 standards* means those FTP exhaust emission standards including the 0.07 g/mi full useful life fleet average NO<sub>x</sub> standard, applicable to new light-duty vehicles and light light-duty trucks that begin a phase-in in the 2004 model year, and those exhaust emission standards including the 0.07 g/mi full useful life fleet average NO<sub>x</sub> standard, applicable to heavy light-duty trucks and medium-duty passenger vehicles that begin a phase-in in the 2008 model year. These standards are found in § 86.1811-04 of this subpart.

*Tier 2 vehicle* means any vehicle certified to comply with the Tier 2 FTP exhaust standards contained in § 86.1811-04 including the 0.07 g/mi fleet average NO<sub>x</sub> standard.

*Tier 3* means relating to the Tier 3 emission standards described in §§ 86.1811-17, 86.1813-17, and 86.1816-18.

*Total hydrocarbon equivalent* means the sum of the carbon mass emissions of non-oxygenated hydrocarbons, methanol, formaldehyde or other organic compounds that are separately measured, expressed as gasoline-fueled vehicle hydrocarbons. In the case of exhaust emissions, the hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1. In the case of diurnal and hot soak emissions, the hydrogen-to-carbon ratios of the equivalent hydrocarbons are 2.33:1 and 2.2:1, respectively.

*Track width* is the lateral distance between the centerlines of the base tires at ground, including the camber angle.

*Trading* means the exchange of complete heavy-duty vehicle NO<sub>x</sub> emission credits between manufacturers.

*Transmission class* has the meaning given in § 600.002-08 of this chapter.

*Transmission configuration* has the meaning given in § 600.002-08 of this chapter.

*United States* has the meaning given in 40 CFR 1068.30.

*U.S. heavy-duty vehicle sales* means sales of heavy-duty vehicles subject to the standards of this subpart, where the sale takes place in any state of the United States except for California (or a state that has adopted California motor vehicle standards for that model year pursuant to section 177 of the Clean Air Act).

*U.S. sales* means, unless otherwise specified, sales in any state or territory of the United States except for California or the section 177 states. Sale location is based on the point of first sale to a dealer, distributor, fleet operator, broker, or other entity.

*Unproven emission control systems* are emission control components or systems (and fuel metering systems) that do not qualify as proven emission control systems.

*Unscheduled maintenance* means any adjustment, repair, removal disassembly, cleaning, or replacement of vehicle components or systems which is performed to correct a part failure or vehicle (if the engine were installed in a vehicle) malfunction which was not anticipated.

*US06* means the test cycle, described in § 86.159-00 and listed in appendix I, paragraph (g), of this part, which is designed to evaluate emissions during aggressive and microtransient driving.

*Useful life* means the period of use or time during which an emission standard applies to light-duty vehicles and light-duty trucks, as described in § 86.1805-01.

*Van* means a light-duty truck or complete heavy-duty vehicle having an integral enclosure, fully enclosing the driver compartment and load carrying device, and having no body sections protruding more than 30 inches ahead of the leading edge of the windshield.

*Vehicle configuration* means a unique combination of basic engine, engine code, inertia weight class, transmission configuration, and axle ratio.

*Volatile liquid fuel* means any fuel other than diesel or biodiesel that is a liquid at atmospheric pressure and has a Reid Vapor Pressure higher than 2.0 pounds per square inch.

*We (us, our)* means the Administrator of the Environmental Protection Agency and any authorized representatives.

*Wheelbase* is the longitudinal distance between front and rear wheel centerlines.

*Zero (0) miles* means that point after initial engine starting (not to exceed 100 miles of vehicle operation, or three hours of engine operation) at which normal assembly line operations and adjustments are completed, and including emission testing, if performed.

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#### § 86.1804-01 Acronyms and abbreviations.

The following abbreviations apply to this subpart:

A/C—Air conditioning.  
 AECD—Auxiliary emission control device.  
 A/F—Air/Fuel  
 ALVW—Adjusted Loaded Vehicle Weight.  
 API—American Petroleum Institute.  
 ASTM—American Society for Testing and Materials.  
 BAT—Bench-Aging Time  
 C—Celsius.  
 cfm—Cubic feet per minute.  
 CFV—Critical flow venturi.  
 CFV-CVS—Critical flow venturi—constant volume sampler.  
 CH<sub>3</sub>OH—Methanol.  
 CID—Cubic inch displacement.  
 Cl—Chemiluminescence.  
 CO—Carbon monoxide.  
 CO<sub>2</sub>—Carbon dioxide.  
 conc.—Concentration.  
 CST—Certification Short Test.  
 cu. in.—Cubic inch(es).  
 CVS—Constant volume sampler.  
 DDV—Durability Data Vehicle.  
 deg.—Degree(s).  
 DNPH—2,4-dinitrophenylhydrazine.  
 EDV—Emission Data Vehicle.  
 EP—End point.

ETW—Equivalent test weight.  
 F—Fahrenheit.  
 FEL—Family Emission Limit.  
 FID—Flame ionization detector.  
 ft.—Feet.  
 FTP—Federal Test Procedure.  
 g—gram(s).  
 gal.—U.S. gallon(s).  
 GC—Gas chromatograph.  
 GVW—Gross vehicle weight.  
 GVWR—Gross vehicle weight rating.  
 H<sub>2</sub>O—Water.  
 HC—Hydrocarbon(s).  
 HCHO—Formaldehyde.  
 HDV—Heavy-duty vehicle.  
 HEV—Hybrid electric vehicle.  
 HFID—Heated flame ionization detector.  
 Hg—Mercury.  
 HLDT—Heavy light-duty truck. Includes only those trucks over 6000 pounds GVWR (LDT3s and LDT4s).  
 HLDT/MDPV—Heavy light-duty trucks and medium-duty passenger vehicles.  
 hp—Horsepower.  
 HPLC—High-pressure liquid chromatography.  
 IBP—Initial boiling point.  
 in.—Inch(es).  
 IUVP—In-Use Verification Program.  
 K—Kelvin.  
 kg—Kilogram(s).  
 km—Kilometer(s).  
 kPa—Kilopascal(s).  
 lb.—Pound(s).  
 LDT1—Light-duty truck 1.  
 LDT2—Light-duty truck 2.  
 LDT3—Light-duty truck 3.  
 LDT4—Light-duty truck 4.  
 LDV/LLDT—Light-duty vehicles and light light-duty trucks. Includes only those trucks rated at 6000 pounds GVWR or less (LDT1s and LDT2s).  
 LDV/T—Light-duty vehicles and light-duty trucks. This term is used collectively to include, or to show that a provision applies to, all light-duty vehicles and all categories of light-duty trucks, i.e. LDT1, LDT2, LDT3 and LDT4.  
 LEV—Low Emission Vehicle.  
 LPG—Liquefied Petroleum Gas.  
 m—Meter(s).  
 max.—Maximum.  
 MDPV—Medium-duty passenger vehicle.  
 mg—Milligram(s).  
 mi.—Mile(s).  
 min.—Minimum.  
 ml—Milliliter(s).  
 mm—Millimeter(s).  
 mph—Miles per hour.  
 mV—Millivolt  
 N<sub>2</sub>—Nitrogen.  
 NDIR—Nondispersive infrared.  
 NLEV—Refers to the National Low Emission Vehicle Program. Regulations governing this program are found at subpart R of this part.  
 NMHC—Nonmethane Hydrocarbons.