

This document contains regulatory language for the Exhaust Emission Standards and Test Procedures – 1985 Through 2006 Model-Year Heavy Duty Urban Bus Engines and Vehicles. Modifications adopted by the ARB at the October 20, and 27, 2005 hearings are also included as underlined language. These requirements are approved by the Air Resources Board, but have not completed the OAL process.

For all official regulatory language, please go to California's Office of Administrative Law (OAL) website at <http://ccr.oal.ca.gov>.

§ 1956.1 Exhaust Emission Standards and Test Procedures – 1985 Through 2006 Model-Year Heavy Duty Urban Bus Engines and Vehicles.

- (a) The exhaust emissions from new 1985 and subsequent model heavy-duty diesel cycle urban bus engines and vehicles fueled by methanol, natural gas, liquefied petroleum gas, and petroleum shall not exceed the following, by model year:
- (1) 1985-1986 - 1.3 grams per brake horsepower-hour (g/bhp-hr) total hydrocarbons (or Organic Material Hydrocarbon Equivalent [OMHCE] for methanol-fueled buses), 15.5 g/bhp-hr carbon monoxide (CO), and 5.1 g/bhp-hr oxides of nitrogen (NO_x).
 - (2) 1987- (a manufacturer may certify to the 1988 emission standards one year early as an option) - 1.3 g/bhp-hr total hydrocarbons (or OMHCE for methanol-fueled buses), 15.5 g/bhp-hr CO, and 5.1 g/bhp-hr NO_x.
 - (3) 1988-1990 - 1.3 g/bhp-hr HC (or OMHCE for methanol-fueled buses), 15.5 g/bhp-hr CO, 6.0 g/bhp-hr NO_x, 0.60 g/bhp-hr particulate matter (PM), and for 1990 only, 1.2 g/bhp-hr optional non-methane hydrocarbons (NMHC).
 - (4) 1991-1993 - 1.3 g/bhp-hr HC (or OMHCE for methanol-fueled buses), 1.2 g/bhp-hr optional NMHC, 15.5 g/bhp-hr CO, 5.0 g/bhp-hr NO_x, and 0.10 g/bhp-hr PM. Emissions from methanol-fueled, natural-gas-fueled and liquefied-petroleum-gas-fueled urban bus engines may be included in the averaging program for petroleum-fueled engines other than urban bus engines.
 - (5) 1994-1995 - 1.3 g/bhp-hr HC (or OMHCE for methanol-fueled buses), 1.2 g/bhp-hr optional NMHC, 15.5 g/bhp-hr CO, 5.0 g/bhp-hr NO_x (or optional 3.5 g/bhp-hr to 0.5 g/bhp-hr NO_x), and 0.07 g/bhp-hr PM. Emissions from methanol-fueled, natural-gas-fueled and liquefied-petroleum-gas-fueled urban bus engines, may be included in the averaging program for petroleum-fueled engines other than urban bus engines.
 - (6) 1996-2003 - 1.3 g/bhp-hr HC or OMHCE, 1.2 g/bhp-hr optional NMHC, 15.5 g/bhp-hr CO, 4.0 g/bhp-hr NO_x, and 0.05 g/bhp-hr PM (0.07 PM g/bhp-hr in-use), except as provided in paragraph (7) below.

- (A) For 1996 and 1997 only, a manufacturer may apply to the Executive Officer for an exemption from the 4.0 g/bhp-hr NOx standard, not to exceed 10% of the average of the manufacturer's total urban bus sales in California for the three preceding model years, upon providing technical justification and sales data for each exemption applied for.
- (B) 1998 through 2003 model year engines may generate averaging, banking, and trading credits in accordance with the requirements for averaging, banking and trading programs set forth in "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy Duty Diesel Engines and Vehicles" incorporated by reference in subdivision (c) of this section.

Manufacturers may choose to certify 1998 through 2002 model year bus engines produced before October 1, 2002, to an optional NOx emissions standard between 0.5 g/bhp-hr and 2.5 g/bhp-hr. A manufacturer may certify to any standard between the values of 2.5 g/bhp-hr and 0.5 g/bhp-hr, by 0.5 g/bhp-hr increments. Manufacturers may not use engines certified to this optional NOx standard for any averaging, banking, or trading program set forth in "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy Duty Diesel Engines and Vehicles" incorporated by reference in subdivision (c) of this section.

- (7) October 1, 2002, PM standard - For diesel-fueled, dual-fuel, and bi-fuel bus engines except for heavy-duty pilot ignition engines, the PM standard shall be 0.01 g/bhp-hr (0.01 PM g/bhp-hr in-use) for 2002 and subsequent model year engines produced beginning October 1, 2002. Manufacturers may choose to meet this standard with an aftertreatment system that reduces PM to 0.01 g/bhp-hr.
- (8) October 2002-2006 optional standards – Except for diesel-fueled, dual-fuel, and bi-fuel engines but including heavy-duty pilot ignition engines, manufacturers may choose to certify 2002 – 2006 model year bus engines produced beginning October 1, 2002, to an optional 1.8 g/bhp-hr to 0.3 g/bhp-hr NOx plus NMHC standard, measured as the arithmetic sum of the NOx and NMHC exhaust component certification values, without

restriction on individual component certification values; provided that engines certified to this optional reduced-emission NO_x plus NMHC standard may not participate in any averaging, banking, or trading program set forth in the test procedures document incorporated by reference in subdivision (c) of this section. A manufacturer may certify to any standard between the values of 1.8 g/bhp-hr to 0.3 g/bhp-hr, by 0.3 g/bhp-hr NO_x + NMHC increments. Manufacturers certifying to this optional standard must also certify to a PM standard of 0.03, 0.02, or 0.01 g/bhp-hr.

- (9) October 2002-2003 optional standards for diesel-fueled, dual-fuel, and bi-fuel engines except for heavy-duty pilot ignition engines – Manufacturers may choose to certify 2002-2003 model year diesel-fueled, dual-fuel, and bi-fuel bus engines produced beginning October 1, 2002, to an optional 1.8 g/bhp-hr to 0.3 g/bhp-hr NO_x plus NMHC standard, measured as the arithmetic sum of the NO_x and NMHC exhaust component certification values, without restriction on individual component certification values; provided that engines certified to this optional reduced-emission NO_x plus NMHC standard may not participate in any averaging, banking, or trading program set forth in the test procedures document incorporated by reference in subdivision (c) of this section. A manufacturer may certify to any standard between the values of 1.8 g/bhp-hr to 0.3 g/bhp-hr, by 0.3 g/bhp-hr NO_x + NMHC increments. Manufacturers certifying to this optional standard must also certify to a PM standard of 0.01 g/bhp-hr.
- (10) 2004 – 2006: Except as provided in paragraph (11), below, the required standard shall be 2.4 g/bhp-hr NO_x + NMHC measured as the arithmetic sum of exhaust component certification values for these pollutants, without restriction on individual component values, 15.5 g/bhp-hr CO, and 0.05 g/bhp-hr PM (0.07 g/bhp-hr PM in-use).
- (A) Manufacturers may choose to certify to a 2.5 g/bhp-hr optional combined NO_x + NMHC standard, provided that the NMHC exhaust component certification value shall not exceed 0.5 g/bhp-hr.
- (B) Emissions averaging may be used to meet the combined NO_x + NMHC standard, the optional combined NO_x + NMHC standard set forth in paragraph (A), and the PM standard.

- (C) The combined NOx + NMHC standard and the optional combined NOx + NMHC standard described in paragraph (A) may serve as the certification standard for the higher emitting fueling mode of an engine certified under the dual fueling mode certification process set forth in section 1956.8(a)(4), Title 13, CCR.
- (11) 2004-2006 – For diesel-fueled, or dual-fuel, and bi-fuel urban bus engines except for heavy-duty pilot ignition engines, the standards are 0.5 g/bhp-hr NOx, 0.01 g/bhp-hr PM, 0.05 g/bhp-hr NMHC, 5.0 g/bhp-hr CO, and 0.01 g/bhp-hr formaldehyde. As an option, manufacturers may choose to meet the NOx and PM standards with a base engine that is certified to the standards in paragraph (10) above, equipped with an aftertreatment system that reduces NOx to 0.5 g/bhp-hr and PM to 0.01 g/bhp-hr standards. The NMHC, CO, and formaldehyde standards in this paragraph (11) shall still apply. Manufacturers shall be responsible for full certification, durability, testing, and warranty and other requirements for the base engine. For the aftertreatment system, manufacturers shall not be subject to the certification durability requirements, or in-use recall and enforcement provisions, but are subject to warranty provisions for functionality.
- (A) Engine manufacturers may sell diesel-fueled, dual-fuel, or bi-fuel engines to any transit fleet exempted by the Executive Officer under paragraphs (b)(8) and (c)(7) of section 2023.1, Title 13, CCR, from the requirements of paragraphs (b)(5) and (c)(4) of section 2023.1, certified to the standards in either paragraphs (9) or (10) above, provided that engines certified to the standards in paragraph (10) must be certified to a 0.01 g/bhp-hr PM standard.
 - (B) Manufacturers may sell diesel-fueled hybrid-electric buses that are certified to a 1.8 g/bhp-hr NOx, 0.01 g/bhp-hr PM, 0.5 g/bhp-hr NMHC, and 15.5 g/bhp-hr CO standard to any transit agency that has received written authorization from the Executive Officer pursuant to paragraph (c)(9) of section 2023.1, title 13, CCR. The formaldehyde standard set forth in paragraph (11), above, shall not apply to the HEBs sold pursuant to this subparagraph.
- ~~(12) 2007 and subsequent – 0.2 g/bhp-hr NOx, 0.01 g/bhp-hr PM, 0.05 g/bhp-hr NMHC, 5.0 g/bhp-hr CO, and 0.01 g/bhp-hr formaldehyde.~~

- (b) 2003-2006 bi-fuel heavy-duty pilot ignition engines – A bi-fuel engine meeting the definition of a heavy-duty pilot ignition engine set forth in section 1956.2 (b)(4) may be certified to the standards in section 1956.1 (a)(8) and (a)(10), provided that the engine is certified to an optional PM standard of 0.03, 0.02, or 0.01 g/bhp-hr.
- (c) Test Procedures. The test procedures for determining compliance with standards applicable to 1985 ~~and subsequent~~ through 2006 model-year heavy-duty diesel cycle urban bus engines and vehicles and the requirements for participation in the averaging, banking and trading programs, are set forth in the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," adopted December 12, 2002, and the "California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric Vehicles, in the Urban Bus and Heavy-Duty Vehicle Classes," adopted October 24, 2002, which are incorporated by reference herein.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43100, 43101, 43104, and 43806, Health and Safety Code, and section 28114, Vehicle Code
Reference: Sections 39002, 39003, 39017, 39033, 39500, 39650, 39657, 39667, 39701, 40000, 43000, 43000.5, 43009, 43013, 43018, 43102, and 43806, Health and Safety Code, and section 28114, Vehicle Code.