State of California
AIR RESOURCES BOARD

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 2004 AND SUBSEQUENT MODEL HEAVY-DUTY DIESEL-ENGINES AND VEHICLES

Adopted:	December 12, 2002
Amended:	July 24, 2003
Amended:	September 1, 2006
Amended:	July 26, 2007
Amended:	October 17, 2007
Amended:	October 14, 2008
Amended:	September 27, 2010
Amended:	October 12, 2011
Amended:	March 22, 2012
Amended:	December 6, 2012

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Table of Contents

I. GENERAL PROVISIONS FOR CERTIFICATION AND IN-USE VERIFICATION OF EMISSIONS. 1

1. General Applicability. [§86.xxx-1] 1
2. Definitions. [§86.xxx-2] 3
3. Abbreviations. [§86.xxx-3] 4
4. Section numbering; construction. [§86.084-4]. September 21, 1994. [No change.] 4
5. General Standards; increase in emissions; unsafe conditions. [§86.090-5] 5
6. Hearings on certification. [§86.078-6] December 12, 1984 [No change.] 5
7. Maintenance of records; submittal of information; right of entry. [§86.000-7] 5
8. Emission standards for light-duty vehicles. [§86.xxx-8] 5
9. Emission standards for light-duty trucks. [§86.xxx-9] 5
10. Emission standards for Otto-cycle heavy-duty engines and vehicles. [§86.xxx-10] 5
11. Emission standards for diesel heavy-duty engines and vehicles. [§86.xxx-11] 5
12. Alternative certification procedures. [§86.080-12] 13
13. Alternative durability program. [§86.xxx-13] 13
14. Small-volume manufacturers certification procedures. [§86.xxx-14] 13
15. NOx plus NMHC and particulate averaging, trading, and banking for heavy-duty engines [§86.xxx-15]. 14
16. Prohibition of defeat devices. §86.004-16 [July 13, 2005]. [No change.] 17
17. On-board diagnostics. [§86.099-17; §86.005-17]; 17
18. §86.xxx-18. [Reserved.] 17
19. §86.xxx-19. [Reserved.] 17
20. Incomplete vehicles, classification. [§86.085-20] 17
21. Application for certification. [§86.xxx-21] 18
22. Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certification and Selective Enforcement Audit, adequacy of limits, and physically adjustable ranges. [§86.001-22] 20
23. Required data. [§86.xxx-23] 20
24. Test vehicles and engines. [§86.xxx-24] 21
25. Maintenance. [§86.xxx-25] 21
26. Mileage and service accumulation; emission measurements. [§86.004-26] 21
27. Special test procedures. [§86.090-27] 21
28. Compliance with emission standards. [§86.xxx-28] 21
30. Certification. [§86.xxx-30] 22
31. Separate certification. [§86.079-31] 24
32. Addition of a vehicle or engine after certification. [§86.079-32] 24
33. Changes to a vehicle or engine covered by certification. [§86.079-33] 24
34. Alternative procedure for notification of additions and changes. [§86.082-34] 25
35. Labeling. [§86.xxx-35]. 25
36. Submission of vehicle identification numbers. [§86.079-36] 29
37. Production vehicles and engines. [§86.085-37] 29
38. Maintenance instructions. [§86.xxx-38] 30
39. Submission of maintenance instructions. [§86.079-39] 31
40. Heavy-duty engine rebuilding practices. [§86.xxx-40] 31

II. TEST PROCEDURES 32

Subpart I - Emission Regulations for New Diesel-Fueled Heavy-Duty Engines; Smoke Exhaust Test Procedure 32
86.884-1 General Applicability. 32
86.884-2 Definitions. 32
86.884-3 Abbreviations. 32
86.884-4 Section numbering. 32
86.884-5 Test Procedures. 32
86.884-6 Fuel specifications. 32
86.884-7 Dynamometer operation cycle for smoke emission tests.. 32
86.884-8 Dynamometer and engine equipment. 32
86.884-9 Smoke measurement system.. 32
86.884-10 Information. 32
86.884-11 Instrument checks.. 32
86.884-12 Test run. 32
86.884-13 Data analysis.. 32
86.884-14 Calculations.. 32

Subpart N - Emission Regulations for New Otto-Cycle and Diesel Heavy-Duty Engines; Gaseous and Particulate Exhaust Test Procedures 33
86.1301 Scope; applicability.. 33
86.1302-84 Definitions. 33
86.1303-84 Abbreviations.. 33
86.1304 Section numbering; construction. 33
86.1305-2004 Introduction; structure of subpart. 33
86.1305-2010 Introduction; structure of subpart. 33
86.1306-96 Equipment required and specifications; overview.. 33
86.1306-2007 Equipment required and specifications; overview. 33
86.1308-84 Dynamometer and engine equipment specifications. 33
86.1309-90 Exhaust gas sampling system; Otto-cycle and non-petroleum fueled engines. 33
86.1310-90 Exhaust gas sampling and analytical system; diesel engines.. 33
86.1310-2007 Exhaust gas sampling and analytical system for gaseous emissions from heavy-duty diesel-fueled engines and particulate emissions from all engines. 33
86.1311-94 Exhaust gas analytical system, CVS bag sample.. 33
86.1312-88 Weighing chamber and microgram balance specifications.. 33
86.1312-2007 Filter stabilization and microbalance workstation environmental conditions, microbalance specifications, and particulate matter filter handling and weighing procedures.. 33
86.1313-94 Fuel specifications.. 33
86.1313-98 Fuel specifications.. 38
86.1313-04 Fuel specifications. 39
86.1313-2007 Fuel specifications. 39
86.1314-94 Analytical gases.. 40
86.1316-94 Calibration; frequency and overview.. 40
86.1318-84 Engine dynamometer system calibrations.. 40
86.1319-90 CVS calibration.. 40
86.1320-90 Gas meter or flow instrumentation calibration; particulate, methanol, and formaldehyde measurement. . 40
86.1321-94 Hydrocarbon analyzer calibration. 41
86.1322-84 Carbon monoxide analyzer calibration. 41
86.1323-84 Oxides of nitrogen analyzer calibration. 41
86.1323-2007 Oxides of nitrogen analyzer calibration. 41

86.1324-84 Carbon dioxide analyzer calibration. 41
86.1325-94 Methane analyzer calibration. 41
86.1326-90 Calibration of other equipment. 41
86.1327-98 Engine dynamometer test procedures; overview. 41
86.1330-90 Test sequence, general requirements.. 41
86.1332-90 Engine mapping procedures. 41
86.1333-90 Transient test cycle generation. 41
86.1333-2010 Transient test cycle generation. 41
86.1334-84 Pre-test engine and dynamometer preparation. 41
86.1335-90 Optional forced cool-down procedure. 41
86.1336-84 Engine starting and restarting.. 41
86.1337-96 Engine dynamometer test run. 41
86.1337-2007 Engine dynamometer test run. 41
86.1338-84 Emission measurement accuracy.. 41
86.1338-2007 Emission measurement accuracy. 41
86.1339-90 Particulate filter handling and weighing. 41
86.1340-94 Exhaust sample analysis. 41
86.1341-98 Test cycle validation criteria. 41
86.1342-94 Calculations; exhaust emissions.. 41
86.1343-88 Calculations; particulate exhaust emissions (including diesel gaseous-fuel, dual-fuel and multi-fuel engines).. 42
86.1344-94 Required information. 42
86.1360-2007 Supplemental emission test; test cycle and procedures. 42
86.1362-2007 Steady-state testing with a ramped-modal cycle. 48
86.1363-2007 Steady-state testing with a discrete-mode cycle. 48
86.1370-2007 Not-To-Exceed test procedures. 48
86.1372-2007 Measuring smoke emissions within the NTE zone. 55
86.1380-2004 Load response test. 55

Subpart S – General Compliance Provisions for Control of Air Pollution From New and In-Use Light-Duty Vehicles, Light-Duty Trucks, and Complete Otto-Cycle Heavy-Duty Vehicles. 56
86.1863-07 Optional chassis certification for diesel vehicles. 56

Subpart T - Manufacturer-Run In-Use Testing Program for Heavy-Duty Diesel Engines. 57
86.1901 What testing requirements apply to my engines that have gone into service? 57
86.1905 How does this program work? 57
86.1908 How must I select and screen my in-use engines? 57
86.1910 How must I prepare and test my in-use engines? 57
86.1912 How do I determine whether an engine meets the vehicle-pass criteria? 57
86.1915 What are the requirements for Phase 1 and Phase 2 testing? 57
86.1917 How does in-use testing under this subpart relate to the emission-related warranty in Section 207(a)(1) of the Clean Air Act? 57
86.1920 What in-use testing information must I report to EPA? 58
86.1925 What records must I keep? 58
86.1930 What special provisions apply from 2005 through 2009? 58

Appendix I to Part 86 - Urban Dynamometer Schedules. 59

Appendix I to Subpart T – Sample Graphical Summary of NTE Emission Results 59

PART 1065 – ENGINE-TESTING PROCEDURES. 60

Subpart A – Applicability and General Provisions **60**
1065.1 Applicability.. 60
1065.2 Submitting information to EPA under this part. 60
1065.5 Overview of this part 1065 and its relationship to the standard-setting part. 60
1065.10 Other procedures.. 60
1065.12 Approval of alternate procedures.. 60
1065.15 Overview of procedures for laboratory and field testing.. 60
1065.20 Units of measure and overview of calculations. 60
1065.25 Recordkeeping. 60

Subpart B – Equipment Specifications **60**
1065.101 Overview. 60
1065.110 Work inputs and outputs, accessory work, and operator demand. 60
1065.120 Fuel properties and fuel temperature and pressure. 60
1065.122 Engine cooling and lubrication. 60
1065.125 Engine intake air. 60
1065.127 Exhaust gas recirculation. 60
1065.130 Engine exhaust. 60
1065.140 Dilution for gaseous and PM constituents. 60
1065.145 Gaseous and PM probes, transfer lines, and sampling system components. 61
1065.150 Continuous sampling. 61
1065.170 Batch sampling for gaseous and PM constituents. 61
1065.190 PM-stabilization and weighing environments for gravimetric analysis. 61
1065.195 PM-stabilization environment for in-situ analyzers. 61

Subpart C – Measurement Instruments **61**
1065.201 Overview and general provisions.. 61
1065.202 Data updating, recording, and control.. 61
1065.205 Performance specifications for measurement instruments.. 61
1065.210 Work input and output sensors. 61
1065.215 Pressure transducers, temperature sensors, and dewpoint sensors. 61
1065.220 Fuel flow meter. 61
1065.225 Intake-air flow meter. 61
1065.230 Raw exhaust flow meter. 61
1065.240 Dilution air and diluted exhaust flow meters. 61
1065.245 Sample flow meter for batch sampling. 61
1065.248 Gas divider. 61
1065.250 Nondispersive infra-red analyzer. 61
1065.260 Flame ionization detector. 61
1065.265 Nonmethane cutter. 61
1065.267 Gas chromatograph. 61
1065.270 Chemiluminescent detector. 62
1065.272 Nondispersive ultraviolet analyzer.. 62
1065.275 N_2O measurement devices. 62
1065.280 Paramagnetic and magnetopneumatic O_2 detection analyzers. 62
1065.284 Zirconia (ZrO_2) analyzer. 62
1065.290 PM gravimetric balance. 62
1065.295 PM inertial balance for field-testing analysis. 62

Subpart D – Calibrations and Verifications **62**
1065.301 Overview and general provisions. 62
1065.303 Summary of required calibration and verifications. 62
1065.305 Verifications for accuracy, repeatability, and noise. 62

1065.307 Linearity verification.. 62
1065.308 Continuous gas analyzer system-response and updating-recording verification. 62
1065.309 Continuous gas analyzer uniform response verification. 62
1065.310 Torque calibration. 62
1065.315 Pressure, temperature, and dewpoint calibration. 62
1065.320 Fuel-flow calibration. 63
1065.325 Intake-flow calibration. 63
1065.330 Exhaust-flow calibration. 63
1065.340 Diluted exhaust flow (CVS) calibration. 63
1065.341 CVS and batch sampler verification (propane check). 63
1065.342 Sample dryer verification. 63
1065.345 Vacuum-side leak verification. 63
1065.350 H_2O interference verification for CO_2 NDIR analyzers. 63
1065.355 H_2O and CO_2 interference verification for CO NDIR analyzers. 63
1065.360 FID optimization and verification. 63
1065.362 Non-stoichiometric raw exhaust FID O2 interference verification. 63
1065.365 Nonmethane cutter penetration fractions. 63
1065.370 CLD CO_2 and H_2O quench verification. 63
1065.372 NDUV analyzer HC and H_2O interference verification. 63
1065.376 Chiller NO_2 penetration. 63
1065.378 NO_2-to-NO converter conversion verification. 63
1065.390 PM balance verifications and weighing process verification. 63
1065.395 Inertial PM balance verifications. 63

Subpart E – Engine Selection, Preparation, and Maintenance 64
1065.401 Test engine selection. 64
1065.405 Test engine preparation and maintenance. 64
1065.410 Maintenance limits for stabilized test engines. 64
1065.415 Durability demonstration. 64

Subpart F – Performing an Emission Test in the Laboratory 64
1065.501 Overview. 64
1065.510 Engine mapping. 64
1065.512 Duty cycle generation. 64
1065.514 Cycle-validation criteria. 64
1065.520 Pre-test verification procedures and pre-test data collection 64
1065.525 Engine starting, restarting, and shutdown. 64
1065.526 Repeating void modes or test intervals. 64
1065.530 Emission test sequence. 64
1065.545 Validation of proportional flow control for batch sampling. 64
1065.546 Validation of minimum dilution ratio for PM batch sampling and drift correction. 64
1065.550 Gas analyzer range validation, drift validation, and drift correction. 64
1065.590 PM sample preconditioning and tare weighing. 64
1065.595 PM sample post-conditioning and total weighing. 64

Subpart G – Calculations and Data Requirements 64
1065.601 Overview. 64
1065.602 Statistics. 64
1065.610 Duty cycle generation. 64
1065.630 1980 international gravity formula. 64
1065.640 Flow meter calibration calculations. 64
1065.642 SSV, CFV, and PDP molar flow rate calculations. 64
1065.645 Amount of water in an ideal gas. 64

1065.650 Emission calculations. 64
1065.655 Chemical balances of fuel, intake air, and exhaust. 64
1065.659 Removed water correction. 64
1065.660 THC and NMHC determination. 64
1065.665 THCE and NMHCE determination. 64
1065.667 Dilution air background emission correction. 64
1065.670 NOx intake-air humidity and temperature corrections. 65
1065.672 Drift correction. 65
1065.675 CLD quench verification calculations. 65
1065.690 Buoyancy correction for PM sample media. 65
1065.695 Data requirements. 65

Subpart H – Engine Fluids, Test Fuels, Analytical Gases and Other Calibration 65

Standards 65
1065.701 General requirements for test fuels.. 65
1065.703 Distillate diesel fuel. 68
1065.705 Residual fuel. 69
1065.710 Gasoline. 69
1065.715 Natural gas.. 69
1065.720 Liquefied petroleum gas. 70
1065.740 Lubricants. 70
1065.745 Coolants. 70
1065.750 Analytical gases. 70
1065.790 Mass standards. 70

Subpart I –Testing with Oxygenated Fuels 71
1065.801 Applicability. 71
1065.805 Sampling system. 71
1065.845 Response factor determination. 71
1065.850 Calculations. 71

Subpart J – Field Testing and Portable Emission Measurement Systems 71
1065.901 Applicability. 71
1065.905 General provisions. 71
1065.910 PEMS auxiliary equipment for field testing. 71
1065.915 PEMS instruments. 71
1065.920 PEMS calibrations and verifications. 71
1065.925 PEMS preparation for field testing. 71
1065.930 Engine starting, restarting, and shutdown. 71
1065.935 Emission test sequence for field testing. 71
1065.940 Emission calculations. 71

Subpart K – Definitions and Other Reference Information 71
1065.1001 Definitions. 71
1065.1005 Symbols, abbreviations, acronyms, and units of measure. 71
1065.1010 Reference materials. 71

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 2004 AND SUBSEQUENT MODEL HEAVY-DUTY DIESEL ENGINES AND VEHICLES

The following provisions of Subparts A, I, N, S, and T, Part 86, and of Subparts A through K, Part 1065, Title 40, Code of Federal Regulations, as adopted or amended by the U.S. Environmental Protection Agency on the date set forth next to the applicable section listed below, and only to the extent they pertain to the testing and compliance of exhaust emissions from heavy-duty diesel engines and vehicles, are adopted and incorporated herein by this reference as the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," except as altered or replaced by the provisions set forth below.

PART 86 – CONTROL OF EMISSIONS FROM NEW AND IN-USE HIGHWAY VEHICLES AND ENGINES

I. GENERAL PROVISIONS FOR CERTIFICATION AND IN-USE VERIFICATION OF EMISSIONS.

§86.1 Reference materials. June 14, 2005.

1 Delete subparagraph (a).

2 Amend subparagraph (b) as follows:

2.1 Delete subparagraphs (b)(1) through (b)(5).

2.2 Subparagraph (b)(6) [No change.]

Subpart A - General Provisions for Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles, Light-Duty Trucks, and Heavy-Duty Engines, and for 1985 and Later Model Year New Gasoline-Fueled, Natural Gas-Fueled, Liquefied Petroleum Gas-Fueled and Methanol-Fueled Heavy-Duty Vehicles.

1. General Applicability. [§86.xxx-1]

A. Federal Provisions.

1. **§86.001-1** October 6, 2000.

1.1 Subparagraph (a) [No change.]

1.2 Subparagraph (b) *Optional Applicability.* [No change.]

1.3 Subparagraphs (c) and (d) Reserved

1.4 Amend subparagraph (e) as follows: *Small volume manufacturers.* Special certification procedures are available for any manufacturer whose projected or actual combined California sales of passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles and heavy-duty engines in its product line (including all vehicles and engines imported under the

provisions of 40 CFR §§85.1505 and 85.1509 of this chapter) are fewer than 4,500 units based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification. For a manufacturer certifying for the first time in California, model year production shall be based on projected California sales. To certify its product line under these optional procedures, the small-volume manufacturer must first obtain the Executive Officer's approval. The manufacturer must meet the eligibility criteria specified in 40 CFR §86.092-14(b) before the Executive Officer's approval will be granted. The small volume manufacturer's heavy-duty engine certification procedures are described in 40 CFR □§86.092-14.

1.5 Subparagraph (f) *Optional procedures for determining exhaust opacity.* [No change.]

2. **§86.005-1** October 6, 2000

2.1 Subparagraph (a) [No change.]

2.2 Subparagraph (b) *Optional Applicability.* [No change.]

2.3 Subparagraph (c) [n/a; Otto-cycle]

2.4 Subparagraph (d) Reserved

2.5 Amend subparagraph (e) as follows: *Small volume manufacturers.* Special certification procedures are available for any manufacturer whose projected or actual combined California sales of passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles and heavy-duty engines in its product line (including all vehicles and engines imported under the provisions of 40 CFR §§85.1505 and 85.1509 of this chapter) are fewer than 4,500 units based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification. For a manufacturer certifying for the first time in California, model year production shall be based on projected California sales. To certify its product line under these optional procedures, the small-volume manufacturer must first obtain the Executive Officer's approval. The manufacturer must meet the eligibility criteria specified in 40 CFR §86.092-14(b) before the Executive Officer's approval will be granted. The small volume manufacturer's heavy-duty engine certification procedures are described in 40 CFR □§86.092-14.

2.6 Subparagraph (f) *Optional procedures for determining exhaust opacity.* [No change.]

B. California provisions.

1. These regulations shall be applicable to all heavy-duty diesel methanol-fueled, ethanol-fueled, natural-gas-fueled and liquefied-petroleum gas-fueled dedicated, dual-fuel and multi-fuel engines (and vehicles) including those engines derived from existing diesel engines. For any engine that is not a distinctly diesel engine nor derived from such, the Executive Officer shall

determine whether the engine shall be subject to these regulations or alternatively to the heavy-duty Otto-cycle engine regulations, in consideration of the relative similarity of the engine's torque-speed characteristics and vehicle applications with those of diesel and Otto-cycle engines. Reference to dual fuel vehicles or engines shall also mean bi-fuel vehicles or engines. References to methanol shall also mean ethanol.

2. References in the federal regulations to light-duty vehicles and light-duty trucks do not apply. References to heavy-duty Otto-cycle engines or vehicles do not apply.

3. Any reference to vehicle or engine sales or vehicle or engine production volume throughout the United States shall mean vehicle or engine sales or vehicle or engine volume in California. References to small volume manufacturers shall mean California small volume manufacturer as defined in section I.1.A., above.

4. Regulations concerning U.S. EPA hearings, U.S. EPA inspections, specific language on the Certificate of Conformity, non-conformance penalties, selective enforcement audit, evaporative emission, high-altitude vehicles and testing, alternative useful life, and Certification Short Test shall not be applicable to these procedures, except where specifically noted. The regulations pertaining to evaporative emissions are contained in “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles,” as incorporated in title 13, CCR §1976. All heavy-duty methanol- and gaseous-fueled vehicles shall comply with the evaporative requirements in title 13, CCR, §1976.

2. Definitions. [§86.xxx-2]

A. Federal Provisions.

1. **§86.004-2** January 18, 2001. [All federal definitions apply, except as otherwise noted below. Definitions specific to other requirements are contained in separate documents.]

2. **§86.010-2** April 30, 2010. [All federal definitions apply, except as otherwise noted below. Definitions specific to other requirements are contained in separate documents.]

B. California Provisions.

“Administrator” means the Executive Officer of the Air Resources Board.

“Certificate of Conformity” means “Executive Order" certifying vehicles for sale in California.

“Certification” means certification as defined in Section 39018 of the Health and Safety Code.

"**EPA**" shall also mean Air Resources Board or Executive Officer of the Air Resources Board
"EPA Enforcement Officer" means the Executive Officer or his delegate.
"Measurement allowance" means accuracy margin.
"Medium-duty engine" means a heavy-duty engine that is used to propel a medium-duty vehicle.
"Medium-duty vehicle" means 2004 through 2006 model year heavy-duty low-emission vehicle, ultra-low-emission vehicle, super-ultra-low-emission vehicle or zero-emission vehicle certified to the standards in title 13, CCR, section 1960.1(h)(2) having a manufacturer's gross vehicle weight rating of 14,000 pounds or less; and any 2004 and subsequent model heavy-duty low-emission, ultra-low-emission, super-ultra-low-emission or zero-emission vehicle certified to the standards in title 13, CCR section 1956.8(h), having a manufacturer's gross vehicle weight rating between 8,501 and 14,000 pounds.
"NTE standard" means NTE emission limit.
"**Warranty period**" [For guidance see title 13, CCR, §□2036].

3. Abbreviations. [§86.xxx-3]

A. Federal Provisions.

1. **§86.000-3 Abbreviations.** October 22, 1996. [All federal abbreviations apply, except as otherwise noted below. Abbreviations specific to other requirements are contained in separate documents.]

B. California Provisions.

"CCR" means "California Code of Regulations
"LEV" means low-emission vehicle
"MDV" means medium-duty vehicle
"OBD" means on-board diagnostics
"ULEV" means ultra-low-emission vehicle
"SULEV" means super-ultra-low-emission vehicle

4. Section numbering; construction. [§86.084-4]. September 21, 1994. [No change.]

The section numbering convention employed in these test procedures, in order of priority, is I.1.A.1.1. in order to distinguish California procedures and requirements from those of the U.S. EPA. References in these test procedures to specific sections of the Code of Federal Regulations maintain the same numbering system employed in the Code of Federal Regulations. California-only requirements are set forth in a separate subsection. In the beginning of each section the general notation §86.xxx-# is used when there is more than one applicable section (or when no versions of the section are being incorporated) to indicate the section being discussed without regard to model

year. The years of applicability (denoted generically "xxx") are added as applicable in the pertinent subsections.

In cases where the entire CFR section is incorporated by reference with no modifications, the notation "[No change.]" is used. In cases where the federal requirements are modified by California requirements, the notation "Amend (or delete) subparagraph (_) as follows:" is used. If the federal requirement is not applicable, the notation "[n/a]" is used. In cases where there are California only requirements, the additional California requirements are noted in a separate subsection with the numbering convention set forth above.

If a CFR section for a specific model year is set forth in this document, and that CFR section references previous CFR sections, then all previously referenced CFR sections are deemed incorporated into this document unless otherwise noted.

5. General Standards; increase in emissions; unsafe conditions. [§86.090-5] November 12, 1996. [No change.]

6. Hearings on certification. [§86.078-6] December 12, 1984 [No change.]

7. Maintenance of records; submittal of information; right of entry. [§86.000-7] October 22, 1996. [No change.]

8. Emission standards for light-duty vehicles. [§86.xxx-8] [n/a]

9. Emission standards for light-duty trucks. [§86.xxx-9] [n/a]

10. Emission standards for Otto-cycle heavy-duty engines and vehicles. [§86.xxx-10] [n/a]

11. Emission standards for diesel heavy-duty engines and vehicles. [§86.xxx-11]

A. Federal provisions.

1. **§86.004-11 Emission standards for 2004 and later model year diesel heavy-duty engines and vehicles.** October 6, 2000.

1.1 Amend subparagraph (a) as follows:

1.1.1 Amend subparagraph (a)(1) Exhaust emissions from new 2004 through 2006 model year diesel HDEs, other than diesel-fueled, dual fuel and bi-fuel urban buses, shall not exceed the following:

1.1.2 Subparagraphs (a)(1)(i) through (a)(iii)(C) [No change.]

1.1.3 Amend subparagraph (a)(2) as follows: The standards set forth in paragraph (a)(1) of this section refer to the exhaust emitted over the operating schedule set forth in paragraph (f)(2) of appendix I to this part, and measured and calculated in accordance with the procedures set

forth in subpart N of this part as amended in part II of these test procedures, except as noted in §86.098-28(c)(2) or superseding sections.

1.2. Subparagraph (b). [No change.]

1.3. Subparagraph (c). [No change.]

1.4 Amend subparagraph (d) as follows: Every manufacturer of new motor vehicle engines subject to the standards prescribed in title 13, CCR, §1956.8 (a), §1956.8 (h), and this section shall, prior to taking any of the actions prohibited by California Health & Safety Code section 43211 or as specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicle engines in accordance with applicable procedures in subpart I or N as amended by these test procedures to ascertain that such test engines meet the requirements of paragraphs (a), (b), (c), and (d) of this section.

1.5 Subparagraph (e). [No change.]

2. **§86.007-11 Emission standards and supplemental requirements for 2007 and later model year diesel heavy-duty engines and vehicles.** July 13, 2005.

2.1. Add the following sentence to the introductory paragraph: Except as otherwise noted, references in this subsection to heavy-duty engines or HDEs shall include medium-duty engines as defined in Section I.2.B of these test procedures.

2.2 Subparagraphs (a) and (a)(1). [No change.]

2.2.1 Amend subparagraph (a)(2) as follows: The standards set forth in paragraph (a)(1) of this section refer to the exhaust emitted over the operating schedule set forth in paragraph (f)(2) of appendix I to this part, and measured and calculated in accordance with the procedures set forth in subpart N of this part as amended in part II of these test procedures, except as noted in §86.007-23(c)(2) or superseding sections.

2.2.2. Delete subparagraph (a)(3). [For guidance see Subpart N, §86.1360-2007 of these test procedures].

2.2.3. Delete subparagraph (a)(4)(i) through (a)(4)(vi). [For guidance see Subpart N, §86.1370-2007 of these test procedures]

2.3 Subparagraphs (b)(1)(i) through (b)(1)(iii). [No change.]

2.3.1 Delete subparagraph (b)(1)(iv). [For guidance see Subpart N, §86.1370-2007 of these test procedures]

2.3.2 Subparagraphs (b)(2)(i). [No change.]

2.3.3 Delete subparagraph (b)(2)(ii). [For guidance see Subpart N, §86.1370-2007 of these test procedures]

2.3.4 Subparagraph (b)(3) and (b)(4). [No change.]

2.4 Subparagraph (c). [No change.]

2.5. Amend subparagraph (d) as follows: Every manufacturer of new motor vehicle engines subject to the standards prescribed in title 13, CCR, §1956.8 (a), §1956.8 (h), and this section shall, prior to taking any of the actions prohibited by California Health & Safety Code section 43211 or as specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicle engines in accordance with applicable procedures in subpart I or N as amended in part II of these test procedures to ascertain that such test engines meet the requirements of paragraphs (a), (b), (c), and (d) of this section.

2.6 Subparagraphs (e) through (h). [No change.]

B. California provisions.

1. **Urban Bus Standards**.

1.1 The exhaust emissions from new 2004 through 2006 model year heavy-duty engines (other than diesel-fueled, dual-fuel and bi-fuel heavy-duty engines) used in urban buses shall not exceed the standards set forth in 40 CFR §86.004-11(a)(1), above.

1.2 The exhaust emissions, as measured under transient operating conditions, from 2004 through 2006 model year diesel-fueled, dual-fuel and bi-fuel heavy-duty engines used in urban buses shall not exceed:

2004 – 2006 Heavy-Duty Diesel-Fuel, Dual Fuel, and Bi-Fuel Urban Bus Engine Exhaust Emission Standards* (grams per brake horsepower-hour or g/bhp-hr)				
NOx[1]	**NMHC or NMHCE**	**CO**[3]	**PM**[2]	**HCHO**[4]
0.5 (0.2 g/megajoule)	0.05 (0.02 g/megajoule)	5.0 (1.9 g/megajoule); [7.0 (2.6 g/megajoule)]	0.01 (0.004 g/megajoule)	0.01 (0.004 g/megajoule)

[1] Oxides of Nitrogen (NOx). This standard is for certification testing and selective enforcement audit testing. As an option, manufacturers may choose to meet the NOx standard with a base engine that is certified to the standards in §86.004-11(a)(1), (October 6, 2000), equipped with an aftertreatment system that reduces NOx to 0.5 g/bhp-hr and PM to 0.01 g/bhp-hr. The NMHC, CO, and formaldehyde standards above 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.

[2] Particulates. This standard is for certification testing, selective enforcement audit testing, and in-use testing. As an option, manufacturers may choose to meet the PM standard with an aftertreatment system that reduces PM to 0.01 g/bhp-hr. 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.

[3] Carbon monoxide. The 5.0 g/bhp-hr (1.9 grams per megajoule) standard is for certification testing and selective enforcement audit testing, and the 7.0 g/bhp-hr (2.6 grams per megajoule) standard is for in-use testing.

[4] Formaldehyde. This standard is for certification testing. selective enforcement audit testing and in-use testing.

1.3 The exhaust emissions from new 2007 and subsequent model year heavy-duty engines used in urban buses shall not exceed the following standards:

2007 and Subsequent Heavy-Duty Diesel Urban Bus Engine Exhaust Emission Standards* (grams per brake-horsepower-hour or g/bhp-hr)				
NOx	**NMHC or NMHCE**	**CO**	**PM**	**HCHO**
0.20 (0.075 g/megajoule)	0.05 (0.02 g/megajoule)	5.0 (1.9 g/megajoule)	0.01 (0.004 g/megajoule)	0.01 (0.004 g/megajoule)

2. **Optional HDE and Urban Bus Standards.** A manufacturer may elect to certify 2004 through 2006 model year heavy-duty diesel engines greater than 14,000 pounds gross vehicle weight rating and heavy-duty engines used in urban buses [excluding diesel-fuel, dual-fuel and bi-fuel heavy-duty diesel engines used in urban bus engines] to the following standards, as measured under transient operating conditions. Engines certified to these standards are not eligible to participate in NOx, NOx plus NMHC, or particulate ABT programs.

OPTIONAL STANDARDS Heavy-Duty Diesel Engines >14,000 lbs. GVW (excluding diesel-fueled, dual fuel, and bi-fuel Urban Buses) (grams per brake-horsepower-hour or g/bhp-hr)			
Model Year	**NOx plus NMHC (or NMHCE)***	**CO**	**PM**
2004–2006*	0.3 to 1.8, inclusive; (in 0.3 g/bhp-hr increments)	15.5	0.01; 0.02; or 0.03

***NOx plus NMHC are measured as the arithmetic sum of the NOx plus NMHC exhaust component certification values.

3. **Formaldehyde Standards**. Formaldehyde exhaust emissions from new 2004 through 2006 model methanol-fueled diesel engines, shall not exceed 0.05 g/bhp-hr.

4. **Requirements for Dual- and Bi-Fuel Engines**. For the 2004 through 2006 model years, an engine family whose design allows engine operation in either of two distinct alternative fueling modes, where each fueling mode is characterized by use of one fuel or a combination of two fuels and significantly different emission levels under each mode, may certify to a different NOx plus NMHC (depending on model year) standard for each fueling mode, provided it meets the following requirements:

(1) The NOx plus NMHC certification standard used for certification under the higher emitting fueling mode must be the standard contained in paragraph 11.A.1 above as appropriate.

(2) The NOx plus NMHC certification standard used for certification under the lower emitting fueling mode must be one of the reduced-emission standards contained in paragraph 11.B.2 above, as appropriate.

(3) The engine family is not used to participate in any manufacturer's averaging, banking or trading program.

(4) The engine family meets all other applicable emission standards in each fueling mode.

(5) The higher emitting fueling mode must be intended only for fail-safe vehicle operation in the case of a malfunction or inadvertent fuel depletion which precludes normal operation in the lower emitting fueling mode. Evidence of such design intent would be a significantly reduced horsepower versus engine speed curve when operating in the higher emitting fueling mode as compared to the curve while operating in the lower emitting fueling mode.

(6) All applicable exhaust emission testing, data submission, and certification application requirements must be met separately for each of the two fueling modes of operation, but should be submitted for ARB approval in a single package.

5. **Standards for Medium-Duty Engines.**

5.1 **Requirements Specific to Heavy-Duty Engines Used in Medium-Duty Vehicles 8,501 to 10,000 pounds GVW.** For the 2004 through 2019 model years, a manufacturer of heavy-duty engines used in medium-duty vehicles 8,501 to 10,000 pounds GVW may choose to comply with the following standards as an alternative to the primary emission standards and test procedures specified in title 13, CCR, §1961 or §1961.2, as applicable. A manufacturer that chooses to comply with these optional heavy-duty standards and test procedures shall specify, in the application for certification, an in-use compliance test procedure, as provided in title 13, CCR, §2139(c). For the 2020 and subsequent model years, a manufacturer of heavy-duty engines used in medium-duty vehicles 8,501 to 10,000 pounds GVW must comply with the primary emission standards and test procedures specified in title 13, CCR, §1961.2.

5.2 **Requirements Specific to Heavy-Duty Engines Used in Medium-Duty Vehicles 10,001 to 14,000 pounds GVW.** For the 2004 and subsequent model years, a manufacturer of heavy-duty engines used in medium-duty vehicles 10,001 to 14,000 pounds GVW may choose to comply with the following standards as an alternative to the primary emission standards and test procedures specified in title 13, CCR, §1961 or §1961.2, as applicable. A manufacturer that chooses to comply with these optional heavy-duty standards and test procedures shall specify, in the application for

certification, an in-use compliance test procedure, as provided in title 13, CCR, §2139(c).

5.3 **Exhaust Emission Standards for Medium-Duty Engines.** The exhaust emissions from new 2004 through 2019 model heavy-duty diesel engines used in ultra-low emission and super-ultra-low emission medium-duty diesel vehicles 8,501 to 10,000 pounds GVW and 2004 and subsequent model heavy-duty diesel engines used in ultra-low emission and super-ultra-low emission medium-duty diesel vehicles 10,001 to 14,000 pounds GVW shall not exceed:

Exhaust Emission Standards for 2004 through 2006 Model Medium-Duty ULEVs and SULEVs				
Vehicle Emission Category	NOx + NMHC	CO	PM	HCHO
ULEV[1] Option A	2.5 (with a 0.5 cap on NMHC)	14.4	0.10	0.050
ULEV[1]; Option B	2.4	14.4	0.10	0.050

Exhaust Emission Standards for 2007 through 2019 Model Medium-Duty ULEVs and SULEVs 8,501-10,000 lbs. GVW and 2007 and Subsequent Model Medium-Duty ULEVs and SULEVs 10,001-14,000 lbs. GVW					
Vehicle Emission Category	NOx	NMHC or NMHCE	CO	PM	HCHO
ULEV[1]	0.20	0.14	15.5	0.01	0.050
SULEV[1]	0.10	0.07	7.7	0.005	0.025

[1] Emissions averaging may be used to meet these standards using the requirements for participation averaging, banking and trading programs, as set forth in Section I.15 of these test procedures.

5.4 **Optional Standards for Complete and Incomplete Heavy-Duty Vehicles.** Manufacturers may request to group complete and incomplete heavy-duty vehicles into the same test group as vehicles certifying to the LEV III exhaust emission standards and test procedures specified in title 13, CCR, §1961.2, so long as those complete and incomplete heavy-duty diesel vehicles meet the most stringent LEV III standards to which any vehicle within that test group certifies.

6. **Heavy-Duty Diesel Engine Idling Requirements**.

6.1 **Engine Shutdown System.** The requirements in this subsection apply to engine manufacturers and original equipment manufacturers, as

applicable, that are responsible for the design and control of engine and/or vehicle idle controls.

6.1.1 **Requirements.** Except as provided in subsections 11.B.6.2 and 3, all new 2008 and subsequent model year heavy-duty diesel engines shall be equipped with an engine shutdown system that automatically shuts down the engine after 300 seconds of continuous idling operation once the vehicle is stopped, the transmission is set to "neutral" or "park," and the parking brake is engaged. If the parking brake is not engaged, then the engine shutdown system shall shut down the engine after 900 seconds of continuous idling operation once the vehicle is stopped and the transmission is set to "neutral" or "park." The engine shutdown system must be tamper-resistant and non-programmable. A warning signal, such as a light or sound indicator inside the vehicle cabin, may be used to alert the driver 30 seconds prior to engine shutdown. The engine shutdown system must be capable of allowing the driver to reset the engine shutdown system timer by momentarily changing the position of the accelerator, brake, or clutch pedal, or other mechanism within 30 seconds prior to engine shutdown. Once reset, the engine shutdown system shall restart the engine shutdown sequence described in this paragraph above, and shall continue to do so until the engine shuts down or the vehicle is driven.

6.1.2 **Engine Shutdown System Override**. The engine shutdown system may be overridden, to allow the engine to run continuously at idle, only under the following conditions:

(1) If the engine is operating in power take-off (PTO) mode. The PTO system shall have a switch or a setting that can be switched "on" to override the engine shutdown system and will reset to the "off" position when the vehicle's engine is turned off or when the PTO equipment is turned off. Subject to advance Executive Officer approval, other methods for detecting or activating PTO operation may be allowed; or,

(2) if the vehicle's engine coolant temperature is below 60°F. The engine shutdown system shall automatically be activated once the coolant temperature reaches 60°F or above. The engine coolant temperature shall be measured with the engine's existing engine coolant temperature sensor used for engine protection, if so equipped. Other methods of measuring engine coolant temperature may be allowed, subject to advance Executive Officer approval.

(3) if an exhaust emission control device is regenerating, and keeping the engine running is necessary to prevent aftertreatment or engine damage, the engine shutdown system may be overridden for the duration necessary to complete the

regeneration process up to a maximum of 30 minutes. Determination of what constitutes the need for regeneration will be based on data provided by the manufacturer at time of certification. Regeneration events that may require longer than 30 minutes of engine idling to complete shall require advance Executive Officer approval. At the end of the regeneration process, the engine shutdown system shall automatically be enabled to restart the engine shutdown sequence described in subparagraph 11.B.6.1.1. above. A vehicle that uses a regeneration strategy under engine idling operating conditions shall be equipped with a dashboard indicator light that, when illuminated, indicates that the exhaust emission control device is regenerating. Other methods of indicating that the exhaust emission control device is regenerating may be used with advance Executive Officer approval.

(4) if servicing or maintenance of the engine requires extended idling operation. The engine's electronic control module may be set to temporarily deactivate the engine shutdown system for up to a maximum of 60 minutes. The deactivation of the engine shutdown system shall only be performed with the use of a diagnostic scan tool. At the end of the set deactivation period, the engine's electronic control module shall reset to restart the engine shutdown system sequence described in subparagraph 11.B.6.1.1 above.

6.2 **Exempt Vehicles**. Heavy-duty diesel engines to be used in buses as defined in California Vehicle Code §§ 233, 612 and 642, school buses as defined in California Vehicle Code § 545, recreational vehicles as defined in Health and Safety Code 18010, medium duty vehicles as defined in § 1900(b)(13) of title 13, California Code of Regulations (CCR), military tactical vehicles as defined in §1905 of title 13, CCR, authorized emergency vehicles as defined in California Vehicle Code § 165, armored cars, as defined in California Vehicle Code § 115, and workover rigs, as defined in § 2449 of title 13, CCR are exempted from these requirements.

6.3 **Optional NOx Idling Emission Standard**. In lieu of the engine shutdown system requirements specified in subsection 11.B.6.1 above, an engine manufacturer may elect to certify its new 2008 and subsequent model year heavy-duty diesel engines to an optional NOx idling emission standard of 30 grams per hour. Compliance with this optional standard will be determined based on testing conducted pursuant to the supplemental NOx idling test cycle and procedures specified in section 86.1360-2007.B.4 below. The manufacturer may request an alternative test procedure if the technology used cannot be demonstrated using the procedures in section 86.1360-2007.B.4, subject to advance approval of the Executive Officer. Manufacturers certifying to the optional NOx idling standard must not increase emissions of CO, PM, or NMHC, determined by comparing results

from the supplemental NOx idling test cycle and procedures specified in section 86.1360-2007.B.4 below, to emission results from the idle mode of the supplemental steady state test cycle or emission results from idle portions of the transient test cycle for heavy duty diesel engines, respectively specified in sections 86-1360-2007 and 86.1327-98, below. With advance Executive Officer approval, a manufacturer may use other methods of ensuring that emissions of CO, PM, and NMHC are not adversely affected in meeting the optional NOx requirement. Also, manufacturers shall state in their application for certification that meeting the optional NOx idling requirement will not adversely affect the associated emissions of CO, PM and NMHC. An engine manufacturer certifying its engine to the optional NOx idling emission standard must also produce a vehicle label, as defined in subsection 35.B.4, below.

6.4 **Optional Alternatives to Main Engine Idling.** All new 2008 and subsequent model year heavy duty diesel engines may also be equipped with idling emission reduction devices that comply with the compliance requirements specified in title 13, CCR section 2485(c)(3).

12. Alternative certification procedures. [§86.080-12] April 17, 1980. [No change.]

13. Alternative durability program. [§86.xxx-13] April 17, 1980. [n/a; light-duty only.]

14. Small-volume manufacturers certification procedures. [§86.xxx-14] April 6, 1994.

A. Federal provisions. [A small volume manufacturer shall mean a California small volume manufacturer as defined in §86.001-1 (e), as modified above. Any reference to 10,000 units shall mean 4,500 units in California based on the average number of units sold for the three previous consecutive model years defined in §86.001-1 (e), as modified in Section I.1.A, above.]

1. **§86.094-14** January 3, 1996. Amend as follows:

1.1 Subparagraphs (a) through (c)(3) [No change.]

1.2 Amend subparagraph (c)(4) as follows: Delete the last sentence, “However, the manufacturer is not required to submit the information to the Administrator unless the Administrator requests it.”

1.3 Subparagraphs (c)(5) through (c)(7)(i)(B) [No change.]

1.4 Amend subparagraph (c)(7)(i)(C)(*1*) as follows: Manufacturers with aggregated sales of less than 301 motor vehicles and motor vehicles engines per year may use assigned deterioration factors that the Executive Officer determines and prescribes based on design specifications or sufficient control over design specifications, development data, in-house testing procedures, and in-use experience. [The remainder of the paragraph is the same.]

1.5 Subparagraphs (c)(7)(i)(C)(*2*) through (c)(13)(i) [No change.]

1.6 Add the following sentence to subparagraph (c)(13)(ii): All running changes that do not adversely affect emissions or the emission control

system durability shall be deemed approved unless disapproved by the Executive Officer within 30 days of the implementation of the running change.

2. **§86.096-14** March 24, 1993. [No change; pertains to evaporative requirements.]

3. **§86.098-14** April 6, 1994. [No change; pertains to evaporative requirements.]

15. NOx plus NMHC and particulate averaging, trading, and banking for heavy-duty engines [§86.xxx-15].

A. Federal provisions.

1. **§86.004-15** February 6, 2000. Amend as follows:

1.1 Add the following sentence to subparagraph (a)(1): Except as otherwise noted, references in this subsection to engines, heavy-duty engines, or HDEs shall include medium-duty engines.

1.2 Subparagraphs (a)(2) through (b)(1)(ii)(A) [No change.]

1.3 Subparagraph (b)(1)(ii)(B). Add the following sentence: In the case of medium-duty engines the FEL is subject to the same upper limit as required for heavy-duty engines.

1.4 Subparagraphs (b)(1)(iii) through (b)(1)(iv)(B). [No change.]

1.5 Subparagraph (b)(1)(iv)(C). Add the following sentence: Credits generated before the year 2004 to be used to certify engines in the combined light heavy-duty and medium-duty averaging set, as described in paragraphs (d)(2)(i) and (e)(2), in the year 2004 and later, must have been generated through the sale of engines in California.

1.6 Subparagraph (b)(2)(i). [No change.]

1.7 Subparagraph (b)(2)(ii) Amend as follows: (ii) The source of the credits to be used to comply with the emission standard if the FEL exceeds the standard, or where credits will be applied if the FEL is less than the emission standard. In cases where credits are being obtained, each engine family involved must state specifically the source (manufacturer/engine family) of the credits being used, including the year of generation of the credits being used and whether the credits were generated from engines sold in California or from 49-state engines. In cases where credits are being generated/supplied, each engine family involved must state specifically the designated use (manufacturer/engine family or reserved) of the credits involved. All such reports shall include all credits involved in averaging, trading or banking.

1.8 Subparagraphs (b)(3) through (c)(1)(ii). [No change.]

1.9 Subparagraph (c)(1)(iii). Add the following sentence: For medium-duty engines certified in the 2004 and 2005 model years, an additional adjustment to the Std value described in this subparagraph (c)(1)(iii), allowing

for certification using Federal certification fuel may be made on an individual engine family basis as determined by the ARB Executive Officer upon application by the engine manufacturer.

1.10 Subparagraphs (c)(2) through (d)(1). [No change.]

1.11 Subparagraph (d)(2). Amend as follows: For NOx plus NMHC credits from diesel-cycle heavy-duty engines:

(i) Heavy heavy-duty engines and medium heavy-duty engines, as defined in §86.004-2, each constitute an averaging set. Light heavy-duty engines, as defined in □§86.004-2, for use in vehicles of more than 14,000 pounds gross vehicle weight rating and medium-duty engines, combined constitute an averaging set. Averaging and trading among all diesel-cycle engine families within the same averaging set is allowed.

(ii) Engines intended for use in urban buses constitute a separate averaging set from all other heavy-duty engines. Averaging and trading between diesel cycle bus engine families within the same averaging set is allowed.

1.12 Subparagraphs (e) and (e)(1). [No change.]

1.13 Subparagraph (e)(2) Amend as follows: (e)(2)

(i) For heavy-duty engines, exclusive of urban bus engines, heavy heavy-duty engines and medium heavy-duty engines, as defined in §86.004-2, each constitute an averaging set. Light heavy-duty engines, as defined in §86.004-2, for use in vehicles of more than 14,000 pounds gross vehicle weight rating and medium-duty engines, combined constitute an averaging set. Averaging and trading between diesel-cycle engine families within the same averaging set is allowed.

1.14 Subparagraphs (e)(3) through (f)(3)(ii). [No change.]

1.15 Subparagraph (f)(3)(iii) Add the following sentences: Banked credits generated before the 2004 model year to be applied toward the certification of engines in the combined light heavy-duty and medium-duty averaging set, as described in paragraphs (d)(2)(i) and (e)(2) above, must have been generated through the sale of eligible engines within California. Credits generated before the 2004 model year from engines sold outside of California may not be used to certify light heavy-duty or medium-duty engines for sale in California. Manufacturers subject to the consent decree shall bank and use credits as allowed in their respective consent decrees.[1]

1.16 Subparagraphs (g) through (i). [No change.]

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[1] Seven of the largest heavy-duty diesel engine manufacturers will be implementing measures to reduce emissions beginning October 1, 2002, to meet the requirements of the Heavy-Duty Diesel Engines Settlement Agreements reached with the ARB. The Heavy-Duty Diesel Engine Settlements were agreements reached in response to lawsuits brought by the United States Environmental Protection Agency and violations alleged by the ARB pertaining to excess in-use emissions caused by the use of defeat devices and unacceptable algorithms. Navistar signed its Settlement Agreement on October 22, 1998. Cummins, Detroit Diesel Corporation, Caterpillar, Volvo, Mack and Renault signed their Settlement Agreements on December 15, 1998.

1.17 Subparagraph (j) Credit apportionment. Delete; replace with: At the manufacturer's option, marketable emission reduction credits for NOx plus NMHC, for use in emission reduction credit programs other than ABT, may be generated based upon engine certification to the optional reduced-emission NOx plus NMHC certification standards of □section I.11.B.2 of these test procedures except that medium-duty engines certified under title 13, CCR, §1956.8(h) for use in vehicles of more than 8,500 pounds through 14,000 pounds gross vehicle weight rating may not be used as the basis for generating marketable emission reduction credits. Use of any marketable emission reduction credits generated must meet the requirements of the individual emission reduction credit program where the credits will be applied.

(1) For those engine sales used to generate ABT credits, the manufacturer shall report engine sales in the category "ABT-only credits." For those engine sales certified to generate marketable emission reduction credits for NOx, the manufacturer shall report engine sales in the category "non-manufacturer-owned credits."

(i) For engine sales reported as "ABT-only credits," the credits generated must be used solely in the ABT program described in this section.

(ii) The engine manufacturer may declare a portion of engine sales "non-manufacturer-owned credits" and any marketable NOx credits generated based upon such sales would belong to the engine purchaser. For ABT, the manufacturer may not generate any credits for the engine sales reported as "non-manufacturer-owned credits."

(2) Only manufacturer-owned credits resulting from engine sales reported as "ABT-only credits" shall be used in the averaging, trading, and banking provisions described in this section.

(3) Credits shall not be double-counted. Credits used in the ABT program may not be provided to an engine purchaser for use in another program.

(4) Manufacturers shall determine and state the number of engines sold as "ABT-only credits" and "non-manufacturer-owned credits" in the end-of-model year reports required under □86.001-23.

1.18 Subparagraphs (k) and (l). [No change.]

2. **§86.007-15**. January 18, 2001. Amend as follows:

2.1 Introductory paragraph; subparagraphs (a) through (m)(9). [No change.]

2.2 Amend subparagraph (m)(9)(i) through (iv) as follows:

(i) Manufacturers certifying a split diesel engine family to both the pre-2007 (phased-out) and post-2007 (phased-in) emission standards

with equally sized subfamilies may exclude the engines within that split family from end-of-year NOx (or NOx+NMHC) ABT calculations, provided that neither subfamily generates credits for use by other engine families, or uses banked credits, or uses averaging credits from other engine families. All of the engines in that split family must be excluded from the phase-in calculations of Sec. 86.007-11(g)(1) (both from the number of engines complying with the standards being phased-in and from the total number of U.S.-directed production engines.)

(ii) [n/a; Otto-cycle]

(iii) [No change.]

(iv) Notwithstanding the provisions of paragraph (m)(9)(iii) of this section, for split families, the NOx FEL shall be used to determine applicability of the provisions of §86.1360-2007 B.1.2 and B.1.3. and Sec.1370-2007 A.1.4.1(iii) and A.1.4.1(iv), as modified by these test procedures.

2.3 Subparagraph (m)(10). [No change.]

B. California provisions

1. For medium-duty diesel-cycle engines certified under title 13, CCR §1956.8(h):

(a) Credits may be generated by an alternative mechanism proposed by the engine manufacturer and approved by the Executive Officer of the ARB. The alternative credit-generating mechanism shall not include any attribute expressly prohibited under the federal ABT program, such as cross-class or cross-fuel trading.

(b) Manufacturers must annually submit a proposed plan for generating credits to the Executive Officer of the ARB and have it approved prior to sale of engines of that model year in California.

16. Prohibition of defeat devices. §86.004-16 [July 13, 2005]. [No change.]

17. On-board diagnostics. [§86.099-17; §86.005-17]; [Delete replace with: All heavy-duty diesel cycle engines used in vehicles up to 14,000 pounds GVW must have an on-board diagnostic system as required in title 13, CCR §1968 et seq, as applicable.]

18. §86.xxx-18. [Reserved.]

19. §86.xxx-19. [Reserved.]

20. Incomplete vehicles, classification. [§86.085-20] January 12, 1983. [No change.]

21. Application for certification. [§86.xxx-21]

A. Federal provisions.

1. **§86.004-21** October 6, 2000. Amend as follows:

1.1 Subparagraphs (a) through (l). [No change.]

1.2 Delete subparagraph (m).

1.2 Subparagraph (n). [No change.]

2. **§86.007-21** August 30, 2006. Amend as follows:

2.1 Subparagraphs (a) through (l). [No change.]

2.2 Delete subparagraph (m).

2.3 Subparagraph (n). [No change.]

2.4 Amend subparagraph (o) as follows: For 2005 and subsequent model year diesel heavy-duty engines, the manufacturer must provide the following additional information pertaining to the supplemental steady-state test conducted under § 86.1360-2007:

2.4.1 Subparagraph (o)(1). [No change.]

2.4.2 Amend subparagraph (o)(2) as follows: For engines subject to the MAEL (see §86.1360-2007B.1), brake specific gaseous emission data for each of the 12 non-idle test points (identified under §86.1360-2007(b)(1)) and the 3 selected test points (identified under §86.1360-2007(b)(2));

2.4.3 Amend subparagraph (o)(3) as follows: For engines subject to the MAEL (see §86.1360-2007B.1), concentrations and mass flow rates of all regulated gaseous emissions plus carbon dioxide;

2.4.4 Subparagraph (o)(4) and (o)(5). [No change.]

2.4.5 Amend subparagraph (o)(6) as follows: For engines subject to the MAEL (see §86.1360-2007B.1), a statement that the engines will comply with the weighted average emissions cap and interpolated values comply with the emission testing caps specified in §86.1360-2007B.1 for the useful life of the engine. The manufacturer also must maintain records at the manufacturer's facility which contain a detailed description of all test data, engineering analyses, and other information which provides the basis for this statement, where such information exists. The manufacturer must provide such information to the Executive Officer upon request.

2.4.6 Subparagraph (o)(7). [Reserve.]

2.5 Amend subparagraph (p) as follows:

2.5.1. (1) The manufacturer must provide a statement in the application for certification that the diesel heavy-duty engine for which certification is being requested will comply with the applicable Not-To-Exceed Limits specified in §86.1370-2007A.1.4 when operated under all conditions which may reasonably be expected to be encountered in normal vehicle operation and use. The manufacturer also must maintain records at the manufacturer's facility which contain all test data, engineering analyses, and other information which provides the basis for this statement, where such

information exists. The manufacturer must provide such information to the Executive Officer upon request.

2.5.2. Subparagraph (p)(2). [No change.]

2.5.3. Amend subparagraph (p)(3) as follows: For each engine model and/or horsepower rating within an engine family for which a manufacturer is applying for a NTE deficiency(ies) under the provisions of §86.1370-2007B.3, the manufacturer's application for an NTE deficiency(ies) must include a complete description of the deficiency, including but not limited to: the specific description of the deficiency; what pollutant the deficiency is being applied for, all engineering efforts the manufacturer has made to overcome the deficiency, what specific operating conditions the deficiency is being requested for (i.e., temperature ranges, humidity ranges, altitude ranges, etc.), a full description of the auxiliary emission control device(s) which will be used to maintain emissions to the lowest practical level; and what the lowest practical emission level will be.

2.6 Subparagraph (q). [No change.]

B. California provisions

1. For 2004 and subsequent model year medium-duty ultra-low-emission and super-ultra-low emission vehicles and engines not powered exclusively by diesel fuel, the manufacturer shall submit projected California sales and fuel economy data two years prior to certification.

2. **Heavy-Duty Diesel Engine Idling Requirements**.

2.1 For 2008 and subsequent model year heavy-duty diesel engines, the manufacturer must provide a statement in the application for certification that the heavy-duty diesel engine for which certification is being requested will comply with the automatic engine shutdown requirements to control idle emissions as specified in subsection 11.B.6.1. If the heavy-duty diesel engine for which certification is being requested is explicitly designed for exempt vehicles, per the provisions in 11.B.6.2, then the manufacturer must also provide a statement in its application for certification so stating.

2.2 A manufacturer that elects to certify engines to the optional NOx idling emission standard, specified in subsection 11.B.6.3, must provide in the application for certification information pertaining to the NOx idling emission certification test conducted under 86.1360-2007.B.4, below, including emissions data for total particulate matter, non-methane hydrocarbons or total hydrocarbons, oxides of nitrogen, carbon monoxide, and carbon dioxide in grams per hour, the test load in brake-horsepower, and engine test speeds in revolutions per minute for both mode 1 and mode 2 testing. With advance Executive Officer approval, a manufacturer may use an alternative procedure to show compliance with the optional NOx idling emission standard. Regardless of the procedure used, the manufacturer shall also provide the appropriate labels to be affixed to the vehicle on which the engine is going to

be installed as required in subsection 35.B.4, below. The manufacturer must maintain records at the manufacturer's facility that contain all test data, engineering analyses, and other information which provide the basis for the compliance statement, where such information exists. The manufacturer must provide such information to the Executive Officer within 30 days upon request.

2.3 If the heavy-duty diesel engine for which certification is being requested incorporates any of the alternative idle emission control strategies contained in title 13, CCR, section 2485(c)(3), then the manufacturer must provide in its application for certification a description of the alternative strategy or technology including the type, brand name, model identification number, and where applicable emissions data and power rating. In addition, the manufacturer must also provide the appropriate labels to be affixed to the outside of the vehicle as required in subsections 35.B.4. If the alternative technology is a fuel-fired heater, then the manufacturer must provide with the application for certification the information required under subsection H.4.4, Part I of the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," as incorporated by reference in title 13, CCR, section 1961(d).

22. Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certification and Selective Enforcement Audit, adequacy of limits, and physically adjustable ranges. [§86.001-22]
April 6, 1994. [No change.]

23. Required data. [§86.xxx-23]

A. Federal provisions.

1. **§86.098-23**. April 30, 2010.

1.1 Subparagraphs (a) through (b)(1)(i) [No change.]

1.2 Add the following sentence to subparagraph (b)(1)(ii): The data derived from testing to determine the exhaust emission deterioration factors shall be submitted to the Executive Officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the Executive Officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the Executive Officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the Executive Officer for review and approval.

1.3 Subparagraphs (b)(2) through (h)(2) [No change.]

1.4 Amend subparagraph (h)(3) as follows:

(h)(3)(i) These reports shall be submitted within 90 days of the end of the model year to: Chief, Mobile Source Operations Division, California Air Resources Board, 9528 Telstar Avenue, El Monte, California 91731.

1.5 Subparagraphs (h)(3)(ii) through (m) [No change.]

2. **§86.001-23.** October 21, 1997. [No change, except that the amendments indicated for §86.098-23 above still apply.]

3. **§86.007-23.** October 30, 2009. [No change, except that the amendments indicated for §86.098-23 above still apply.]

24. Test vehicles and engines. [§86.xxx-24]

A. Federal provisions.

1. **§86.001-24**. October 22, 1996. [No change except that the reference in subparagraph (e)(2) to 10,000 light-duty vehicles, light-duty trucks, heavy-duty vehicles and heavy-duty engines shall mean 4,500 units based on the average number of vehicles or engines sold for the three previous consecutive model years for which a manufacturer seeks certification in California.]

25. Maintenance. [§86.xxx-25]

A. Federal provisions.

1. **§86.004-25**. October 21, 1997.

1.1 Subparagraphs (a) through (b)(6)(ii). [No change.]

1.2 Add the following phrase to the last sentence of subparagraph (b)(6)(iii): … or California Vehicle Code □27156, et seq.

1.3 Subparagraphs (b)(7)(i) and (b)(7)(ii). [No change.]

1.4 Add the following sentence to subparagraph (b)(7)(iii): The Executive Officer may also provide the manufacturer a hearing in accordance with title 17, CCR, §□60040, et seq., with respect to such issue.

2. **§86.007-25.** January 18, 2001. [No change except that the amendments indicated for §86.004-25 above still apply.]

26. Mileage and service accumulation; emission measurements. [§86.004-26] July 13, 2005.

27. Special test procedures. [§86.090-27] April 11, 1989. [No change.]

28. Compliance with emission standards. [§86.xxx-28] January 18, 2001.

A. Federal provisions.

1. **§86.004-28**. August 30, 2006. Amend as follows:

1.1 Subparagraphs (a) through (c)(4)(i) [No change.]

1.2 Amend subparagraph (c)(4)(ii) as follows: [No change, except that diesel-cycle smoke testing shall only apply to petroleum-fueled diesel-cycle engines.]

1.3. Subparagraph (c)(4)(iii)(A) [n/a; Otto-cycle engines.]

1.4 Subparagraph (c)(4)(iii)(B): [No change, except that the exhaust emission results for formaldehyde exhaust emission results for methanol-fueled engines and vehicles, ultra-low emission vehicles and super-ultra-low emission vehicles shall also be adjusted by the appropriate deterioration factor (through addition or multiplication as the case may be.]

1.5 Amend subparagraph (c)(4)(iii)(B)(*3*) as follows: For petroleum-fueled diesel cycle HDEs only: [No change to remainder of paragraph.]

1.6 Subparagraphs (c)(iv) through (i). [No change.]

B. California provisions.

1. **Deterioration factor for exhaust emissions.**

1.1 **Additive deterioration factor.** Except as specified in paragraph B.1.2 of this section, use an additive deterioration factor for exhaust emissions. An additive deterioration factor for a pollutant is the difference between exhaust emissions at the end of the useful life and exhaust emissions at the low-hour test point. In these cases, adjust the official emission results for each tested engine at the selected test point by adding the factor to the measured emissions. If the factor is less than zero, use zero. Additive deterioration factors must be specified to one more decimal place than the applicable standard.

1.2 **Multiplicative deterioration factor.** Use a multiplicative deterioration factor if good engineering judgment calls for the deterioration factor for a pollutant to be the ratio of exhaust emissions at the end of the useful life to exhaust emissions at the low-hour test point. For example, if you use aftertreatment technology that controls emissions of a pollutant proportionally to engine-out emissions, it is often appropriate to use a multiplicative deterioration factor. Adjust the official emission results for each tested engine at the selected test point by multiplying the measured emissions by the deterioration factor. If the factor is less than one, use one. A multiplicative deterioration factor may not be appropriate in cases where testing variability is significantly greater than engine-to-engine variability. Multiplicative deterioration factors must be specified to one more significant figure than the applicable standard.

29. Testing by the Administrator. [§86.091-29]. March 24, 1993. [No change.]

30. Certification. [§86.xxx-30]

A. Federal provisions

1. **§86.004-30**. October 6, 2000. Amend as follows:

1.1 Subparagraphs (a) through (a)(2). [No change.]

1.2 Add the following sentence to subparagraph (a)(3)(i). For heavy-duty engines certified under the provisions of section I.11.B.4 of these test procedures two certificates will be issued, one for each fueling mode. [No change to remainder of paragraph.]

1.3 Subparagraphs (a)(3)(ii) through (b)(2). [No change.]

1.4 Subparagraph (b)(3). Add the following sentence: If, after a review of the request and supporting data, the Executive Officer finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with title 17, CCR, § 60040, et seq., with respect to such issue.

1.5 Subparagraph (b)(4). [No change.]

1.6 Subparagraph (b)(4)(i). Add the following phrase at the beginning of the paragraph: Request a hearing under title 17, CCR, § 60040, et seq.; or…

1.7 Subparagraph (b)(4)(ii) through (b)(5). No change.

1.8 Subparagraph (b)(5)(i). Add the following phrase at the beginning of the paragraph: Request a hearing under title 17, CCR, § 60040, et seq.; or…

1.9. Subparagraph (b)(5)(ii) through (c)(5). [No change.]

1.10 Subparagraph (c)(5)(i). Add the following phrase at the beginning of the paragraph: Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with title 17, CCR, § 60040, et seq. hereof; and …

1.11 Subparagraph (c)(5)(ii). [No change.]

1.12 Subparagraph (c)(6). Add the following sentence: The manufacturer may request in the form and manner specified in paragraph (b)(3) of this section that any determination made by the Executive Officer under paragraph (c)(1) of this section to withhold or deny certification be reviewed in a hearing conducted in accordance with title 17, CCR, § 60040, et seq. If the Executive Officer finds, after a review of the request and supporting data, that the request raises a substantial factual issue, he will grant the request with respect to such issue.

1.13 Subparagraphs (d) through (e). [No change.]

1.14 Delete subparagraph (f) and replace with the following: All medium-duty diesel cycle engines used in vehicles up to 14,000 pounds GVW must have an on-board diagnostic system as required in title 13, CCR §1968 et seq, as applicable.

2. **§86.007-30**. February 24, 2009. Amend as follows:

1.1 Subparagraphs (a) through (a)(2). [No change.]

1.2 Add the following sentence to subparagraph (a)(3)(i). For heavy-duty engines certified under the provisions of section I.11.B.4 of these test

procedures two certificates will be issued, one for each fueling mode. [No change to remainder of paragraph.]

1.3 Subparagraphs (a)(3)(ii) through (b)(2). [No change.]

1.4 Subparagraph (b)(3). Add the following sentence: If, after a review of the request and supporting data, the Executive Officer finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with title 17, CCR, §60040, et seq., with respect to such issue.

1.5 Subparagraph (b)(4). [No change.]

1.6 Subparagraph (b)(4)(i). Add the following phrase at the beginning of the paragraph: Request a hearing under title 17, CCR, §60040, et seq.; or…

1.7 Subparagraph (b)(4)(ii) through (b)(5). [No change.]

1.8 Subparagraph (b)(5)(i). Add the following phrase at the beginning of the paragraph: Request a hearing under title 17, CCR, §60040, et seq.; or…

1.9. Subparagraph (b)(5)(ii) through (c)(5). [No change.]

1.10 Subparagraph (c)(5)(i). Add the following phrase at the beginning of the paragraph: Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with title 17, CCR, §60040, et seq. hereof; and …

1.11 Subparagraph (c)(5)(ii). [No change.]

1.12 Subparagraph (c)(6). Add the following sentence: The manufacturer may request in the form and manner specified in paragraph (b)(3) of this section that any determination made by the Executive Officer under paragraph (c)(1) of this section to withhold or deny certification be reviewed in a hearing conducted in accordance with title 17, CCR, §60040, et seq. If the Executive Officer finds, after a review of the request and supporting data, that the request raises a substantial factual issue, he will grant the request with respect to such issue.

1.13 Subparagraphs (d) through (e). [No change.]

1.14 Delete subparagraph (f) and replace with the following: All medium-duty diesel cycle engines used in vehicles up to 14,000 pounds GVW must have an on-board diagnostic system as required in title 13, CCR §1968 et seq, as applicable.

31. Separate certification. [§86.079-31] September 8, 1977. [No change.]

32. Addition of a vehicle or engine after certification. [§86.079-32] September 8, 1977. [No change.]

33. Changes to a vehicle or engine covered by certification. [§86.079-33] September 8, 1977. [No change.]

34. Alternative procedure for notification of additions and changes. [§86.082-34] November 2, 1982. [No change.]

35. Labeling. [§86.xxx-35].

A. Federal Provisions.

1. **§86.001-35** April 6, 1994.

1.1 Add the following sentence to the introductory paragraph: The labeling requirements of this section shall apply to all new motor vehicle engines certified according to the provisions of California Health and Safety Code Section 43100.

1.2 Subparagraphs (a)(1) through (a)(3)(iii)(G). [No change.]

1.3 Amend subparagraph (a)(3)(iii)(H) as follows:

1.3.1 An unconditional statement of compliance with the appropriate model year California regulations; for example, "This engine conforms to California regulations applicable to XXXX model year new heavy-duty diesel engines." It may also state that the engine conforms to any applicable federal or Canadian emission standards for new heavy-duty diesel engines.

1.3.2 For 2004 through 2006 model year heavy heavy-duty diesel-fueled, dual-fuel, and bi-fuel engines to be used in urban buses that are certified to the optional reduced emission standards and are sold to any transit agency exempted under paragraphs (c)(8) and (d)(7), title 13, CCR, §1956.2 from the requirements of paragraphs (c)(5) and (d)(4), title 13, CCR §956.2.

"This engine conforms to California regulations applicable to XXXX model year new urban bus or heavy-duty diesel engines and is certified to a NOx plus NMHC optional reduced-emission standards of XXX g/bhp-hr (for optional reduced-emission standards specify between 0.3 and 1.8, inclusive, at 0.3 b/bhp-hr increments, and a particulate matter standards of 0.01 g/bhp-hr)."

1.3.3 For all other 2004 through 2006 model year heavy-duty diesel cycle engines, including those used in urban buses, that are certified to the optional reduced-emission standards, the label shall contain the following statement:

"This engine conforms to California regulations applicable to XXXX model year new (specify urban bus or heavy-duty diesel) engines and is certified to a NOx plus NMHC optional reduced-emission standards of XXX g/bhp-hr (for optional reduced-emission standards specify between 0.3 and 1.8, inclusive, at 0.3 b/bhp-hr increments, and a particulate matter standard of 0.03 g/bhp-hr, 0.02 g/bhp-hr, or 0.01 g/bhp-hr)."

1.4 Subparagraphs (a)(3)(I) through (i). [No change.]

2. **§86.007-35**. August 30, 2006.

2.1 Subparagraphs (a) through (i). [No change except that the amendments set forth in §86.001-35 apply.]

B. California provisions.

1. For 2004 and later model year heavy-duty diesel engines certified under the requirements of title 13, CCR, §1956.8(a)(3), the statement of compliance requirements of this subsection shall be repeated for each of the two fueling modes of operation. Appended to the statement for the lower emitting fueling mode of operation shall be the following sentence:

> "This certification is valid only while operating on ___ (indicate the fuel or fuel combination under which this mode of operation was certified) fuel. Operation using any other fueling mode will result in significant increases in exhaust emissions and significantly reduce engine performance."

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

3. Statements shall not be used on labels placed on engines that, in fact, do not comply with all applicable California regulations.

4. **Vehicle Labels for Heavy-Duty Diesel Engine Idling Requirements.** For each 2008 and subsequent model year heavy-duty diesel engine certified to the optional NOx idling emission standard pursuant to paragraph 11.B.6.3 or equipped with a certified/verified auxiliary power system (APS) pursuant to title 13, CCR, section 2485(c)(3)(A), a single label shall be produced and affixed, as applicable, on each vehicle equipped with such heavy-duty diesel engine.

4.1 The labeling requirements for engine manufacturers, aftermarket APS manufacturers and installers, and original equipment manufacturers are as follows:

4.1.1 Engine manufacturers. The engine manufacturer that has certified an engine to the optional NOx idling emission standard pursuant to paragraph 11.B.6.3, or certified/verified an APS pursuant to title 13, CCR, section 2485(c)(3)(A), shall produce the appropriate label for each new engine or APS pursuant to paragraph 35.B.4.2, below. The label shall be affixed on the outside of the vehicle pursuant to paragraph 35.B.4.3 by the original equipment manufacturer.

4.1.2 Aftermarket APS manufacturers and installers. An aftermarket APS manufacturer that has certified/verified an APS pursuant to title 13, CCR, section 2485(c)(3)(A), shall produce the appropriate label

for each APS system pursuant to paragraph 35.B.4.2, below. The label shall be affixed on the outside of the vehicle pursuant to paragraph 35.B.4.3 by the party that is responsible for installing the APS on the vehicle.

4.1.3 Original equipment manufacturer. An original equipment manufacturer that has certified an engine to the optional NOx idling emission standard pursuant to paragraph 11.B.6.3, or certified/verified an APS pursuant to title 13, CCR, section 2485(c)(3)(A), shall produce and affix the appropriate label on the outside of the vehicle pursuant to paragraphs 35.B.4.2 or 35.B.4.3, whichever is applicable.

4.2 **Label Format.** Figure 1 shows a facsimile of the label format for an engine certified to the optional NOx idling emission standard pursuant to paragraph 11.B.6.3. Figure 2 shows a facsimile of the label format for an engine in a certified/verified APS pursuant to title 13, CCR, section 2485(c)(3)(A). The engine manufacturer, APS manufacturer or original equipment manufacturer, whichever is applicable, that produces and affixes the label on the vehicle must ensure that the label has the following characteristics:

Figure 1

Figure 2

4.2.1 Oval shape.

4.2.2 Dimensions of no less than 6 inches wide by 4 inches high.

4.2.3 The color of the outer and inner ellipses shall be dark blue and the stars in red. The background of the label shall be light blue in color. The size of the stars shall be equal to the size of the characters as specified in paragraph 35.B.4.2.4 below.

4.2.4 A vehicle equipped with an engine that is certified pursuant to paragraph 11.B.6.3 shall have a label with the word “CERTIFIED,” and below it the phrase “CLEAN IDLE,” as shown in Figure 1. A vehicle equipped with an APS certified/verified pursuant to title 13, CCR, section 2485(c)(3)(A) shall have a label with the word “VERIFIED,” and below it the phrase “CLEAN APS,” as shown in Figure 2. The label information shall be written in the English language with sans serif font, black in color, and in upper case letters. The size of the font shall be at least 7/16 inch (or 32 points) and the spacing of the fonts must be such that the longest phrase (for example, “CLEAN IDLE”) extends from the left edge to the right edge of the inner edge of the inner ellipse, without touching the edges. The label information shall be centrally aligned, both vertically and horizontally.

4.2.5 A hologram as shown in Figure 3 shall be embedded within the proposed label. The hologram must cover the entire label. The hologram shall have the phrase “Clean Skies” repeatedly written from edge to edge of the label boundaries and each phrase shall be separated by a circular bullet. The position of the circular bullet in each line shall be exactly above the space between the words “Clean” and “Skies” of the line below. The color of the font shall be orange. The font size“ shall be less than or equal to a quarter of the font size of the phrase “CLEAN IDLE” or “CLEAN APS” as specified in subsection 35.B.4.2.4, above. The hologram shall have the map of the State of California, in orange color, overlaid over the text and positioned in the center of the label as shown in Figure 3, below.

4.3 Label Location and Attachment Requirements

4.3.1 The appropriate label shall be permanently affixed to the exterior on the driver’s side of the hood, in an area within one foot by one foot from the top and front edges of the hood. If such an attachment is not feasible, the label may be attached at a different location subject to advance approval by the Executive Officer.

4.3.2 Each label must be affixed in such a manner that it can not be removed without destroying or defacing the label. The label must not be affixed to any vehicle component that can easily be detached from the vehicle.

4.3.3 The label and any adhesives used must be designed to withstand, for a period of 10 years, typical environmental conditions. Typical environmental conditions include, but are not limited to, exposure to extreme heat or cold, moisture, engine fuels, lubricants and coolants.

4.4 The party that certifies/verifies the engine pursuant to paragraph 11.B.6.3 or the APS pursuant to title 13, CCR, section 2485(c)(3)(A) shall be the ultimate party responsible for ensuring that the labels are correctly produced. Samples of labels produced pursuant to this subsection must be submitted to the Executive Officer with the applicable certification or verification application.

4.5 Labels on vehicles may also be applied by original equipment manufacturers, distributors, or dealers. However, the party that certified the engine or the APS and produced the labels remains the ultimate party responsible for ensuring that the labels are correctly administered. If the labels are administered by the original equipment manufacturer, dealer, or distributor, the producer of the label shall include its name and a serial number on the label. The location of the producer's name and serial number on the label shall be written in the lower part of the label, in the space vertically centered between the label wording and the inner ellipses, and the font must contrast the label background. The serial numbers of the labels administered must be recorded by the original equipment manufacturer, distributor, or dealer and reported to the party responsible for producing the labels. This information shall be maintained by the party responsible for producing the labels for a period of 10 years, and shall be made available to the Executive Officer upon request.

4.6 A heavy-duty diesel engine that has been certified pursuant to subsection 11.B.6.3 shall not be modified or altered unless said modification or alteration has been approved by the Executive Officer pursuant to title 13 CCR sections 2220 through 2225.

4.7 An idling emission reduction device or system that has been certified/verified pursuant to title 13, CCR, section 2485(c)(3)(A) shall not be modified or altered unless said modification or alteration has been approved by the Executive Officer pursuant to title 13 CCR sections 2470 through 2476.

36. Submission of vehicle identification numbers. [§86.079-36] [n/a]

37. Production vehicles and engines. [§86.085-37] June 6, 1997. [No change.]

38. Maintenance instructions. [§86.xxx-38]

A. Federal provisions

1. **§86.004-38** June 27, 2003.

1.1 Subparagraphs (a) through (f). [No change.]

1.2 Amend subparagraph (g)(1) as follows: (g) Emission control diagnostic service information:

(1) Manufacturers shall furnish or cause to be furnished to any person engaged in the repairing or servicing of motor vehicles or motor vehicle engines, or the Administrator upon request, any and all information needed to make use of the on-board diagnostic system and such other information, including instructions for making emission-related diagnosis and repairs, including, but not limited to, service manuals, technical service bulletins, recall service information, data stream information, bi-directional control information, and training information, unless such information is protected by section 208(c) of the Act or California Government Code Section 6250, as a trade secret. No such information may be withheld under section 208(c) of the Act or California Government Code Section 6250 if that information is provided (directly or indirectly) by the manufacturer to franchised dealers or other persons engaged in the repair, diagnosing, or servicing of motor vehicles or motor vehicle engines.

1.3 Subparagraphs (g)(2) through (h). [No change.]

2. **§86.007-38** June 29, 2004.

2.1 Subparagraphs (a) through (h). [No change, except as amended in §86.004-38, above.]

2.2 Amend subparagraph (i) as follows: For each new diesel-fueled engine subject to the standards prescribed in title 13, CCR §1956.8(a), §1956.8(h), and Sec. 86.007-11, as applicable, the manufacturer shall furnish or cause to be furnished to the ultimate purchaser a statement that "This engine must be operated only with low sulfur diesel fuel (that is, diesel fuel meeting ARB specifications for highway diesel fuel, including a 15 ppm sulfur cap)."

3. **§86.010-38** April 30, 2010.

3.1 Subparagraphs (a) through (f). [No change.]

3.2 Subparagraph (g). Delete; replace with: Manufacturers of heavy-duty diesel engines used in vehicles weighing 14,000 pounds GVW and less must comply with the motor vehicle service information requirements set forth in title 13, CCR §1969.

3.3 Subparagraph (h). [No change.]

3.4 Amend subparagraph (i) as follows: For each new diesel-fueled engine subject to the standards prescribed in title 13, CCR §1956.8(a), §1956.8(h), and Sec. 86.007-11, as applicable, the manufacturer shall

furnish or cause to be furnished to the ultimate purchaser a statement that "This engine must be operated only with low sulfur diesel fuel (that is, diesel fuel meeting ARB specifications for highway diesel fuel, including a 15 ppm sulfur cap)."

3.5 Subparagraph (j). Delete; replace with: Manufacturers of heavy-duty diesel engines used in vehicles over 14,000 pounds GVW must comply with the motor vehicle service information requirements set forth in title 13, CCR §1969.

39. Submission of maintenance instructions. [§86.079-39] September 8, 1977. [No change.]

40. Heavy-duty engine rebuilding practices. [§86.xxx-40]

A. Federal Provisions.

1. **§86.004-40** January 18, 2001.

1.1 Add the following sentence to the introductory paragraph: Any deviation from the provisions contained in this section is also a prohibited act under California Vehicle Code section 27156, et seq.

1.2 Subparagraphs (a) through (e). [No change.]

II. TEST PROCEDURES

Subpart I - Emission Regulations for New Diesel-Fueled Heavy-Duty Engines; Smoke Exhaust Test Procedure

86.884-1 General Applicability. September 21, 1994.

The provisions of this subpart are applicable to new petroleum-fueled diesel heavy-duty engines beginning with the 1984 model year.

The provisions of this subpart are not applicable to new heavy-duty diesel gaseous-fuel engines and those gaseous-fuel engines derived from diesel engines, except dual-fuel and multi-fuel engines which use petroleum fuel.

86.884-2 Definitions. November 16, 1983.
86.884-3 Abbreviations. November 16, 1983.
86.884-4 Section numbering. September 21, 1994.
86.884-5 Test Procedures. April 11, 1989.
86.884-6 Fuel specifications. April 11, 1989.
86.884-7 Dynamometer operation cycle for smoke emission tests. September 5, 1997.
86.884-8 Dynamometer and engine equipment. July 13, 2005.
86.884-9 Smoke measurement system. September 5, 1997.
86.884-10 Information. July 13, 2005.
86.884-11 Instrument checks. December 10, 1984.
86.884-12 Test run. July 13, 2005.
86.884-13 Data analysis. September 5, 1997.
86.884-14 Calculations. January 15, 2004.

Subpart N - Emission Regulations for New Otto-Cycle and Diesel Heavy-Duty Engines; Gaseous and Particulate Exhaust Test Procedures

86.1301 Scope; applicability. July 13, 2005.
86.1302-84 Definitions. November 16, 1983.
86.1303-84 Abbreviations. November 16, 1983.
86.1304 Section numbering; construction. July 13, 2005.
86.1305-2004 Introduction; structure of subpart. October 6, 2000.
86.1305-2010 Introduction; structure of subpart. September 15, 2011.
86.1306-96 Equipment required and specifications; overview. September 21, 1994.
86.1306-2007 Equipment required and specifications; overview. January 18, 2001.
86.1308-84 Dynamometer and engine equipment specifications. December 10, 1987.
86.1309-90 Exhaust gas sampling system; Otto-cycle and non-petroleum fueled engines. January 18, 2001.

Amend subparagraph (a)(3) as follows: For methanol-fueled engines, the sample lines for the methanol and formaldehyde samples are heated to $235^{o} \pm 15^{o}$F ($113^{o} \pm 8^{o}$C).

86.1310-90 Exhaust gas sampling and analytical system; diesel engines. September 5, 1997.
86.1310-2007 Exhaust gas sampling and analytical system for gaseous emissions from heavy-duty diesel-fueled engines and particulate emissions from all engines. January 18, 2001 [No change.]

86.1311-94 Exhaust gas analytical system, CVS bag sample. October 21, 1997.
86.1312-88 Weighing chamber and microgram balance specifications. September 5, 1997.
86.1312-2007 Filter stabilization and microbalance workstation environmental conditions, microbalance specifications, and particulate matter filter handling and weighing procedures. January 18, 2001.

86.1313-94 Fuel specifications. September 5, 1997.

Amend as follows:

1. Subparagraph (a) Gasoline fuel [n/a]

2. Subparagraph (b) Petroleum diesel test fuel. [For guidance see §86.1313-98.]

3. Subparagraph (c) Methanol fuel. Amend □86.1313-94(c) as follows: Delete subparagraphs (c)(1) and (c)(2); replace with:

3.1 (1) **Exhaust emission test fuel**. For Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles which use Otto-cycle or diesel

alcohol engines, methanol or ethanol fuel used for exhaust and evaporative emission testing shall meet the specifications set forth in section 2292.1, title 13, CCR, (Specifications for M-100 Fuel Methanol) or section 2292.3 (Specification for E-100 Fuel Ethanol) as modified by the following:

Specification	Limit
M-100 Fuel Methanol	
Methanol	98.0 ± 0.5 vol. percent
Ethanol	1.0 vol. Percent (max.)
Petroleum fuel meeting the specifications of 40 CFR §86.1313-98	1.0 ± 0.1 vol. percent
E-100 Fuel Ethanol	
Ethanol	98.0 ± 0.5 vol. percent
Methanol	1.0 vol. Percent (max.)
Petroleum fuel meeting the specifications of 40 CFR §86.1313-98	1.0 ± 0.1 vol. percent

3.2 (2) **Mileage accumulation fuel.** For Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles which use Otto-cycle or diesel alcohol engines, methanol or ethanol fuel used for service accumulation shall meet the applicable specifications set forth in section 2292.1, title 13, CCR, (Specifications for M-100 Fuel Methanol) or section 2292.3 (Specification for E-100 Fuel Ethanol).

3.3 (3) [No change.]

3.4 Fuel additives and ignition improvers intended for use in alcohol test fuels shall be subject to the approval of the Executive Officer. In order for such approval to be granted, a manufacturer must demonstrate that emissions will not be adversely affected by the use of the fuel additive or ignition improver.

4. Subparagraph (d) Mixtures of petroleum and methanol fuels for flexible fuel vehicles. Amend 86.1313-94(d) as follows: Delete subparagraphs (d)(1) and (d)(2); replace with:

4.1 (1) **Exhaust emission test fuel for emission-data and durability-data vehicles**. For Otto-cycle or diesel alcohol vehicles and hybrid electric

vehicles which use Otto-cycle or diesel alcohol engines, methanol or ethanol fuel used for exhaust emission testing shall meet the applicable specifications set forth in section 2292.2, title 13, CCR, (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specifications for E-85 Fuel Ethanol) as modified by the following:

Specification	Limit
M-85 Fuel Methanol	
Petroleum fuel meeting the specifications of 40 CFR §86.1313-98	13-16 vol. percent
Reid vapor pressure	8.0-8.5 psi, using common blending components from the gasoline stream.
E-85 Fuel Ethanol	
Petroleum fuel meeting the specifications of 40 CFR §86.1313-98	15-21 vol. percent
Reid vapor pressure	8.0-8.5 psi, using common blending components from the gasoline stream.

4.2 (2) **Mileage accumulation fuel.** For flexible fuel Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles that use Otto-cycle or diesel alcohol engines, petroleum fuel shall meet the applicable specifications in 86.1313-98(a) or (b), as modified by these test procedures, and methanol or ethanol fuel shall meet the applicable specifications set forth in section 2292.2, title 13, CCR, (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specification for E-85 Fuel Ethanol). Mileage accumulation procedures shall be subject to the requirements set forth in 40 CFR 86.001-26 and 86.1831-01(a) and (b) and are subject to the prior approval of the Executive Officer. A manufacturer shall consider expected customer fuel usage as well as emissions deterioration when developing its durability demonstration.

4.3 (3) [No change.]

4.4 **Evaporative emission test fuel for emission-data and durability-data vehicles.** For Otto-cycle or diesel alcohol vehicles and hybrid electric vehicles which use Otto-cycle or diesel alcohol engines, a blend of methanol or ethanol fuel used for evaporative emission testing shall

meet the applicable specifications set forth in section 2292.2, title 13, CCR, (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specifications for E-85 Fuel Ethanol) and gasoline meeting the specifications of 86.1313-94 (a)(1), as modified by these test procedures, such that the final blend is composed of either 35 volume percent methanol (□ 1.0 volume percent of total blend) for methanol-fueled vehicles or 10 volume percent ethanol (□ 1.0 volume percent of total blend) for ethanol-fueled vehicles. Alternative alcohol-gasoline blends may be used in place of M35 or E10 if demonstrated to result in equivalent or higher evaporative emissions, subject to prior approval of the Executive Officer.

4.5 **Additive requirements.** Fuel additives and ignition improvers intended for use in alcohol test fuels shall be subject to the approval of the Executive Officer. In order for such approval to be granted, a manufacturer must demonstrate that emissions will not be adversely affected by the use of the fuel additive or ignition improver.

5. Subparagraph (e) Natural gas fuel. Amend □86.1313-94(e) as follows: Delete subparagraphs (e)(1), (e)(2) and (e)(3); Replace with:

5.1 (1) **Exhaust emission test fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use natural gas, fuel used for exhaust and evaporative emission testing shall meet the specifications listed in section 2292.5, title 13, CCR, (Specifications for Compressed Natural Gas) as modified by the following:

Specification	**Limit**
Compressed Natural Gas Certification Test Fuel	
Methane	90.0 ± 1.0 mole percent
Ethane	4.0 ± 0.5 mole percent
C_3 and higher hydrocarbon content	2.0 ± 0.3 mole percent
Oxygen	0.5 mole percent maximum
Inert gases (CO_2 + N_2)	3.5 ± 0.5 vol. percent

5.2 (2) **Mileage accumulation fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use natural gas, fuel used for service accumulation shall meet the specifications listed in section 2292.5, title 13, CCR, (Specifications for Compressed Natural Gas).

5.3 (3) Delete.

5.4 (4) [No change.]

6. Amend 86.1313-94(f) as follows: Delete subparagraphs (f)(1) and (f)(2); Replace with:

6.1 (1) **Evaporative and exhaust emission test fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use liquefied petroleum gas, fuel used for exhaust and evaporative emission testing shall meet the specifications listed in section 2292.6, title 13, CCR, (Specifications for Liquefied Petroleum Gas) as modified by the following:

Specification	Limit
Liquefied Petroleum Gas Certification Test Fuel	
Propane	93.5 ± 1.0 volume percent
Propene	3.8 ± 0.5 volume percent
Butane and heavier components	1.9 ± 0.3 volume percent

6.2 (2) **Mileage accumulation fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use liquefied petroleum gas, fuel used for service accumulation shall meet the specifications listed in section 2292.6, title 13, CCR, (Specifications for Liquefied Petroleum Gas).

6.3 (3) [No change.]

7. §86.1313-94(g) [No change.]

8. Add the following California only requirement: Identification of New Clean Fuels to be Used in Certification Testing

Any person may petition the state board to establish by regulation certification testing specifications for a new clean fuel for which specifications for the new clean fuel are not specifically set forth in paragraph □ 86.1313-98 as amended herein. Prior to adopting such specifications, the state board shall consider the relative cost-effectiveness of use of the fuel in reducing emissions compared to the use of other fuels. Whenever the state board adopts specifications for a new clean fuel for certification testing, it shall also establish by regulation specifications for the fuel as it is sold commercially to the public.

(a) If the proposed new clean fuel may be used to fuel existing motor vehicles, the state board shall not establish certification specifications for the fuel unless the petitioner has demonstrated that:

(1) Use of the new clean fuel in such existing motor vehicles would not increase emissions of NMHC, NOx, CO, and the potential risk associated with toxic air contaminants, as determined pursuant to the procedures set forth in the "California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels," as adopted September 17, 1993. In the case of fuel-flexible vehicles or dual-fuel vehicles that were not certified on the new clean fuel but are capable of being operated on it, emissions during operation with the new clean fuel shall not increase compared to emissions during vehicle operation on gasoline.

(2) Use of the new clean fuel in such existing motor vehicles would not result in increased deterioration of the vehicle and would not void the warranties of any such vehicles.

(b) Whenever the state board designates a new clean fuel pursuant to this section, the state board shall also establish by regulation required specifications for the new clean fuel sold commercially in California.

86.1313-98 Fuel specifications. February 18, 2000.

1. Subparagraph (a) [n/a]

2. Amend subparagraph (b) Diesel test fuel as follows:

2.1 Subparagraph (b)(1) [No change.]

2.2 Add the following language to subparagraph (b)(2): For 2004 through 2005 model year medium-duty diesel-fueled engines, the petroleum fuel used in exhaust emissions testing may meet the specifications listed below, or substantially equivalent specifications approved by the Executive Officer, as an option to the specifications in Table N90-2. Where a manufacturer elects pursuant to this subparagraph to conduct exhaust emission testing using the specifications in Table N98-2, or the specifications listed below, the Executive Officer shall conduct exhaust emission testing with the diesel fuel meeting the specifications elected by the manufacturer. The manufacturer shall submit evidence to the Executive Officer demonstrating to the Executive Officer's satisfaction that the test fuel will be the predominant in-use fuel. Such evidence could include such things as copies of signed contracts from customers indicating the intent to purchase and use the test

fuel as the primary fuel for use in the engines or other evidence acceptable to the Executive Officer.

Fuel Property	Limit	Test Method [a]
Natural Cetane Number	47-55	D613-86
Distillation Range, ^{o}F		Title 13 CCR, §2282(g)(3)
IBP	340-420	
10% point	400-490	
50% point	470-560	
90% point	550-610	
EP	580-660	
API Gravity, degrees	33-39	D287-82
Total Sulfur, wt. %	0.01-0.05	Title 13 CCR, §2282(g)(3)
Nitrogen Content, ppmw	100-500	Title 13 CCR, §2282(g)(3)
Total Aromatic Hydrocarbons, vol.%	8-12	Title 13 CCR, §2282(g)(3)
Polycyclic Aromatic Hydrocarbons, wt. % (max.)	1.4	Title 13 CCR, §2282(g)(3)
Flashpoint, ^{o}F (max)	130	D 93-80
Viscosity @ 40°C, centistokes	2.0-4.1	D 445-83

[a] ASTM specifications unless otherwise noted. A reference to a subsection of Title 13, CCR, §2282 means the test method identified in that subsection for the particular property. A test method other than that specified may be used following a determination by the Executive Officer that the other method produces results equivalent to the results of the specified method.

2.3 (3) Add the following language to subparagraph (b)(3): For 2004 and 2005 model year medium-duty diesel-fueled engines, diesel fuel representative of commercial diesel fuel which will be generally available through retail outlets shall be used in service accumulation.

3. Subparagraphs (c), (d) and (e). [For guidance see §86.1313-94, above.]

86.1313-04 Fuel specifications. January 18, 2001. [n/a]
86.1313-2007 Fuel specifications. January 18, 2001.

1. Subparagraph (a) [n/a]
2. Subparagraph (b) heading and (b)(1) [No change]
3. Reletter subparagraph §86.1313-2007(b)(2) as (b)(2)(A) and add the following:

(b)(2)(B) Diesel fuel having the specifications listed below may be used in exhaust

emission testing as an option to the specifications in Table N07-2. If a manufacturer elects to use this option, the Executive Officer shall conduct exhaust emission testing with diesel fuel having the specifications listed below.

Fuel Property	*Limit*	*Test Method* [a]
Natural Cetane Number	47-55	D613-86
Distillation Range, ^{o}F		Title 13 CCR, §2282(g)(3)
IBP	340-420	
10% point	400-490	
50% point	470-560	
90% point	550-610	
EP	580-660	
API Gravity, degrees	33-39	D287-82
Total Sulfur, ppm	7-15	Title 13 CCR, §2282(g)(3)
Nitrogen Content, ppmw	100-500	Title 13 CCR, §2282(g)(3)
Total Aromatic Hydrocarbons, vol.%	8-12	Title 13 CCR, §2282(g)(3)
Polycyclic Aromatic Hydrocarbons, wt. % (max.)	1.4	Title 13 CCR, §2282(g)(3)
Flashpoint, ^{o}F (max)	130	D 93-80
Viscosity @ 40°C, centistokes	2.0-4.1	D 445-83

[a] ASTM specifications unless otherwise noted. A reference to a subsection of Title 13, CCR, §2282 means the test method identified in that subsection for the particular property. A test method other than that specified may be used following a determination by the Executive Officer that the other method produces results equivalent to the results of the specified method.

4. Subparagraph (b)(3) [No change]

86.1314-94 Analytical gases. June 30, 1995.
86.1316-94 Calibration; frequency and overview. September 5, 1997.
86.1318-84 Engine dynamometer system calibrations. December 10, 1984.
86.1319-90 CVS calibration. January 18, 2001.
86.1320-90 Gas meter or flow instrumentation calibration; particulate, methanol, and formaldehyde measurement. April 11, 1989.

86.1321-94 Hydrocarbon analyzer calibration. July 13, 2005.
86.1322-84 Carbon monoxide analyzer calibration. September 5, 1997.
86.1323-84 Oxides of nitrogen analyzer calibration. September 5, 1997.
86.1323-2007 Oxides of nitrogen analyzer calibration. January 18, 2001
86.1324-84 Carbon dioxide analyzer calibration. September 5, 1997.
86.1325-94 Methane analyzer calibration. September 5, 1997.
86.1326-90 Calibration of other equipment. April 11, 1989.
86.1327-98 Engine dynamometer test procedures; overview. September 5, 1997.
86.1330-90 Test sequence, general requirements. January 18, 2001.
86.1332-90 Engine mapping procedures. September 21, 1994.
86.1333-90 Transient test cycle generation. February 18, 2000.
86.1333-2010 Transient test cycle generation. June 30, 2008.
86.1334-84 Pre-test engine and dynamometer preparation. January 18, 2001.
86.1335-90 Optional forced cool-down procedure. September 5, 1997.
86.1336-84 Engine starting and restarting. September 21, 1994.
86.1337-96 Engine dynamometer test run. September 5, 1997.
86.1337-2007 Engine dynamometer test run. January 18, 2001.
86.1338-84 Emission measurement accuracy. September 5, 1997.
86.1338-2007 Emission measurement accuracy. January 18, 2001.
86.1339-90 Particulate filter handling and weighing. January 18, 2001.
86.1340-94 Exhaust sample analysis. June 30, 1995.
86.1341-98 Test cycle validation criteria. September 5, 1997.
86.1342-94 Calculations; exhaust emissions. September 5, 1997.

* * * * *

Amend subparagraph (d) Meaning of symbols as follows:

* * * * *

Delete subparagraph (d)(1)(ii)(D) and replace with: If gaseous fuels are being used, 18.64 g/ft^3 for natural gas and 17.28 g/ft^3 for liquefied petroleum gas, assuming an average carbon to hydrogen ratio of 1:3.803 for natural gas and 1:2.656 for liquefied petroleum gas, at 68°F and 760 mm Hg pressure. The Executive Officer may approve other density values deemed appropriate by a manufacturer when gaseous fuels are being used.

Amend subparagraph (d)(3)(v)(B) as follows: $CO_e = [1-(0.01 + 0.005HCR)CO_{2e} - 0.00323R]CO_{em}$ for methanol fuel, where HCR is hydrogen to carbon ratio as measured for the fuel used. For natural gas and liquefied petroleum gas, HCR is assumed to be 2.656 and 3.802, respectively.

Amend subparagraph (d)(8)(iii) as follows: For petroleum-fueled, gaseous-fueled, and methanol-fueled diesel engines: $K_H = 1/[1-0.0026(H-75)]$ (or for SI units, = 1/[1-0.0182 (H-10.71)]).

86.1343-88 Calculations; particulate exhaust emissions (including diesel gaseous-fuel, dual-fuel and multi-fuel engines). September 5, 1997.
86.1344-94 Required information. October 21, 1997.
86.1360-2007 Supplemental emission test; test cycle and procedures. June 30, 2008.

A. Federal provisions

1. Introductory paragraph. [No change.]

2. Amend subparagraph (a) as follows: Applicability. This section applies to 2005 and subsequent model year heavy duty diesel engines.

3. Amend subparagraph (b) as follows:
   3.1 Amend subparagraph (b)(1) as follows: The ramped-modal procedures described in §86.1362-2007 apply to 2007 and subsequent model year heavy duty diesel engines. See B.1. of this section for the procedures applicable to 2005 and 2006 model year engines.

   3.2. Subparagraph (b)(2): [No change.]

4. Subparagraph (c). [No change.]

5. Subparagraph (d). Determining the control area. [No change.]

6. Subparagraph (e). [Reserve.]

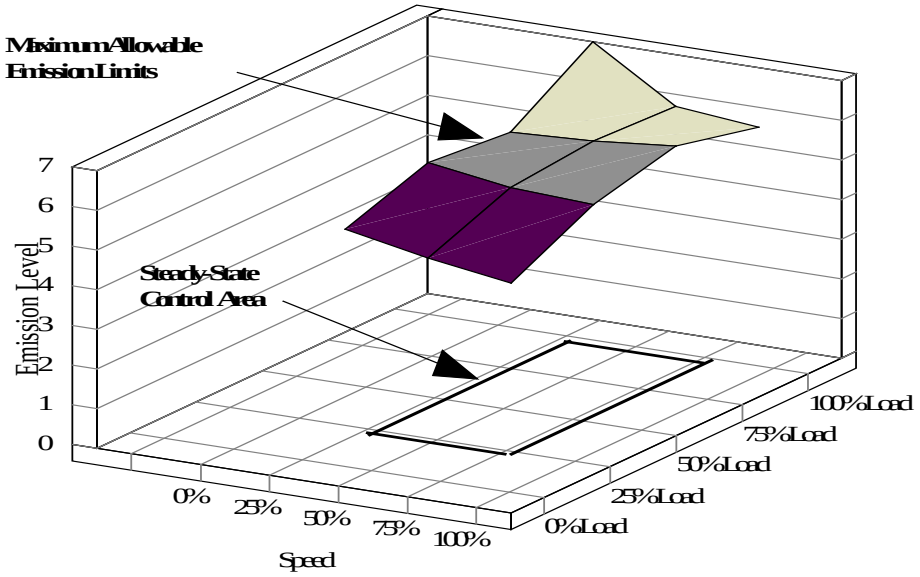
7. Amend subparagraph (f) as follows: Maximum allowable emission limits.

   (1) For gaseous emissions, the 12 non-idle test point results and the four-point linear interpolation procedure specified in paragraph (g) of this section for intermediate conditions, shall define Maximum Allowable Emission Limits for purposes of paragraph B.1 of this section except as modified under paragraph (f)(3) of this section. [No change to remainder of paragraph.]

Figure 1

Maximum Allowable Emission Limits

Sample – For Illustration Only



(2) If the weighted average emissions, calculated according to paragraph (e)(6) of this section, for any gaseous pollutant is equal to or lower than required by paragraph B.1 of this section, each of the 13 test values for that pollutant shall first be multiplied by the ratio of the applicable emission standard (under paragraph B.1 of this section) to the weighted average emissions value, and then by 1.10 for interpolation allowance, before determining the Maximum Allowable Emission Limits under paragraph (g)(2) of this section.

(3) [No change.]

8. Subparagraph (g) Calculating intermediate test points. [No change.]

B. California provisions

1. **Emission testing caps and procedures for the 2005 and subsequent model years**.

1.1 Testing to determine whether an engine meets the applicable emission limits when measured over the supplemental emission test is performed according to section 86.1363-2007. The weighted average exhaust emissions, as determined according to 86.1363-2007(g), for each

regulated pollutant shall not exceed 1.0 times the applicable emission standards specified in Part I.11 of these test procedures or FELs specified in §86.007-11(a)(1).

1.2 For engines not having a NOx FEL less than 1.5 g/bhp-hr, gaseous exhaust emissions shall not exceed the steady-state interpolated values determined by the Maximum Allowable Emission Limits (for the corresponding speed and load), as determined under subparagraph (g) of this section, when the engine is operated in the steady-state control area defined under subparagraph (d) of this section, during steady-state engine operation.

1.3 For engines with a NOx FEL less than 1.5 g/bhp-hr, the Maximum Allowable Emission Limit requirements, as determined under Sec. 86.1360-2007(f), do not apply.

1.4 The emission caps specified in this section shall be rounded to the same number of significant figures as the applicable standards in Part I.11 of these test procedures using ASTM E29-93a.

2. **In-Use Compliance for 2005 and subsequent model year engines.** The procedures for in-use voluntary and influenced recall for heavy-duty diesel engines under this section are described in title 13, CCR §§2111 through 2140, except as modified by this paragraph for 2005 and 2006 model year engines. In evaluating the scope of the affected population for the purposes of this section, there shall be a rebuttable presumption that the affected population is the engine family to which the tested engines belong. No engine may be used to establish the existence of an emissions exceedance if the engine or vehicle in which it was installed was subject to abuse or improper maintenance or operation, or if the engine was improperly installed, and such acts or omissions caused the exceedance.

2.1 For the purposes of this section, an exceedance of the emission testing caps occurs when the average emissions of the test vehicles or engines, pursuant to title 13, CCR §2139, for any pollutant exceed the emission threshold. For the purposes of this section, emission threshold is defined as:

(i) for a test using vehicle test equipment (e.g., an over-the-road mobile monitoring device such as “ROVER”, or a chassis dynamometer), the applicable maximum NOx emissions limit plus the greater of 0.5 g/bhp-hr or one standard deviation of the data set established pursuant to paragraph B.2.2 of this section; or

(ii) for a test using an engine dynamometer, the applicable maximum NOx emissions limit plus 0.5 g/bhp-hr.

2.2 Where an engine dynamometer or vehicle test shows an apparent exceedance of the emissions threshold, the party conducting the original test shall repeat such test under the same conditions at least nine times. The mean of the tests shall be used for the averaging of the test vehicle emissions in determining compliance.

2.3 If the average emissions of the test vehicles exceed the emissions threshold, the Executive Officer shall notify the manufacturer in writing of the test results. The manufacturer has the option to submit an influenced recall plan in accordance with title 13, CCR §§ 2113 through 2121 within 45 days or to proceed with performing the engineering analysis and/or conducting further testing in accordance with paragraphs B.2.4 and/or B.2.5 of this section. Upon the completion of testing conducted in paragraph(s) B.2.4 and/or B.2.5 if the test results indicate that the average emissions of the test vehicles exceeds the emissions threshold, the Executive Officer shall notify the manufacturer in writing of the test results and upon receipt of the notification, the manufacturer shall have 45 days to submit an influenced recall plan in accordance with title 13, CCR §§ 2113 through 2121.

2.4 If the testing conducted under paragraph B.2.1 and title 13, CCR § 2139 was performed using vehicle test equipment, then the engine manufacturer may elect to conduct additional tests of that engine using an engine dynamometer, provided that all environmental and engine operating conditions present during vehicle testing under paragraph B.2.1 and title 13, CCR § 2139 can be reproduced or corrected consistent with paragraph B.2.6 of this section. If the engine manufacturer elects to conduct such additional engine dynamometer tests, it shall provide ARB with at least three business days notice prior to commencement of such testing. If based on such additional tests the engine exceeds the emission threshold, the engine manufacturer may conduct further testing in accordance with paragraph B.2.5 of this section and/or perform an engineering analysis to determine the percentage of the affected population that exceeds the emissions threshold and the emission levels of the exceeding engines. However, the manufacturer may not determine the percentage of the affected population or the emission levels solely on the basis of an engineering analysis unless it demonstrates to the Executive Officer's satisfaction that such analysis alone is sufficient under the circumstances.

2.5 Within 60 days of receiving notice of an exceedance under paragraph B.2.3 of this section, the manufacturer may commence testing of not less than ten additional in-service engines. The manufacturer may

conduct these tests using vehicle testing equipment, or using an engine dynamometer, at the manufacturer's option.

2.6 The testing of additional engines under paragraphs B.2.4 and B.2.5 of this section shall be conducted under conditions that are no less stringent than the initial test in terms of those parameters that may affect the result, and, at the manufacturer's option, may be limited to those emission limits and conditions for which apparent exceedances have been identified. Such parameters typically, but not necessarily, include relevant ambient conditions, operating conditions, service history, and age of the vehicle. Prior to conducting any testing, the manufacturer shall submit a test plan to ARB for its review and approval. Within 30 days following ARB's proposed modifications, the manufacturer shall incorporate the proposed modifications and implement the test plan as approved. Special conditioning of test engines shall not be permitted. Where the manufacturer elects to conduct the additional testing utilizing an engine dynamometer, it shall reproduce relevant engine operating and environmental conditions associated with the initial exceedance, provided, however, that correction factors may be used to reproduce temperature, humidity or altitude conditions that cannot be simulated in the laboratory. Regardless of the testing equipment utilized, the test results shall be adjusted to reflect documented test systems error and/or variability in accordance with good engineering practices.

3. **Exemptions**.

3.1 The requirements set forth in this section do not apply to "ultra-small volume manufacturers" for model years 2005 and 2006. For the purposes of this section, an "ultra-small volume manufacturer" means any manufacturer with California sales less than or equal to 300 new passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles, and heavy-duty engines per model year based on the average number of vehicles and engines sold by the manufacturer in the previous three consecutive model years.

3.2 The requirements set forth in this section do not apply to "urban buses", as defined in title 13, CCR §1956.2, for model years 2005 and 2006.

4. **Determination of NOx Idling Emissions.** The requirements set forth in this subparagraph apply to 2008 and subsequent model year heavy-duty diesel engines certifying to the optional NOx idling emission standard specified in subsection 11.B.6.3, above. To determine whether an engine meets the optional NOx idling emission standard, emissions shall be measured by testing the engine on an engine dynamometer as described below.

4.1 **Test Cycle**. The following 2 mode duty cycle shall be performed on a dynamometer on the test engine:

Mode	Engine Speed (rpm)	Time in mode (seconds)	Engine Load
1	Manufacturer Recommended Curb idle	1800	See subparagraph 4.1.1 below
2	1100	1800	See subparagraph 4.1.2 below

4.1.1 For mode 1, the dynamometer load or torque applied shall be based on the vehicle power requirements during curb idle operation. The engine manufacturer shall determine the curb idle speed and the appropriate test load for the test engine. The load shall include curb idle power requirements needed for operating engine accessories, such as the engine cooling fan, alternator, coolant pump, air compressor, engine oil and fuel pumps and any other engine accessory operated during curb idle of the engine. The load for mode 1 may not include power requirements for operating the air conditioning compressor or for operating on-board accessories, such as a microwave, refrigerator, television, computer, etc., that the vehicle operator may use during rest periods.

4.1.2 For mode 2, the dynamometer load or torque applied shall be based on the vehicle power requirements during idle speed operations of 1100 revolutions per minute (rpm). The engine manufacturer shall determine the appropriate test load for the test engine. The load shall include high engine idle speed power requirements needed for operating engine accessories, such as the engine cooling fan, alternator, coolant pump, air compressor, engine oil and fuel pumps, air conditioning compressor set at maximum capacity, and any other engine accessory operated during the idle operation of the engine. The total test load shall be equal to the test load so determined plus an additional load of 2 kilowatts to take into account the power needs for operating on-board accessories such as a television, refrigerator, microwave, computer, etc.

4.2 **Test Requirements.**

4.2.1 **Pre-conditioning**. Prior to measuring emissions, bring the engine to a warm condition as follows:

(a) If the idling test follows directly after testing over the Federal Test Procedure or the supplemental emission tests, consider the engine warm. Bring down the engine to the manufacturer recommended curb idle speed, apply the appropriate

load as determined in subparagraph 4.1.1, and start measuring emissions after 10 minutes and only after achieving temperature stability. Temperature stability may be determined as the point at which the engine coolant temperature is within 2% of its mean value for at least 2 minutes.

(b) If the engine is cold, warm-up the engine by operating it at any speed above peak-torque speed and between 65 to 85% of maximum mapped power until the engine coolant's temperature is within 2% of its mean value for at least 2 minutes or until the engine thermostat controls engine temperature.

4.2.2 **Test Sequence**. Following engine warm-up as described in subparagraph 4.2.1, the test shall be performed first for mode 1. Bring down the engine to the curb idle speed, apply the appropriate load as determined in subparagraph 4.1.1, and start measuring emissions after 10 minutes and only after achieving temperature stability. Temperature stability may be determined as the point at which the engine coolant temperature is within 2% of its mean value for at least 2 minutes. Upon completion of mode 1 testing, the engine speed shall be ramped up to 1100 rpm. Once the engine starts operating at 1100 rpm, apply the appropriate load as determined in subparagraph 4.1.2, and start measuring emissions after 10 minutes and only after achieving temperature stability. Temperature stability may be determined as the point at which the engine coolant temperature is within 2% of its mean value for at least 2 minutes. The engine shall be operated for the prescribed time in each mode. The specified test speed shall be held to within ±50 rpm and the specified torque shall be held to within ±2 percent of the maximum torque at the test speed.

4.2.3 **Calculations.** For each test mode, calculate the modal average mass emissions level for each regulated pollutant, in grams per hour, the modal average power, in brake horsepower and the modal average speed, in rpm. For compliance, the calculated average NOx emissions of each mode shall not exceed the optional NOx idling emission standard of 30 grams per hour specified in subsection 11.B.6.3 above.

86.1362-2007 Steady-state testing with a ramped-modal cycle. June 30, 2008.
86.1363-2007 Steady-state testing with a discrete-mode cycle. June 30, 2008.
86.1370-2007 Not-To-Exceed test procedures. November 8, 2010.

A. Federal provisions.

1. Amend subparagraph (a) as follows: General. The purpose of this test procedure is to measure in-use emissions of 2005 and subsequent model year heavy-duty diesel engines while operating within a broad range of speed and load points (the Not-To-Exceed Control Area) and under conditions which can

reasonably be expected to be encountered in normal vehicle operation and use. Emission results from this test procedure are to be compared to the Not-To-Exceed Limits specified in paragraph (d)(1) of this section. The Not-To-Exceed Limits specified in paragraph (d)(1) of this section do not apply for engine starting conditions. Tests conducted using the procedures specified in §1901 are considered valid Not-to-Exceed tests (Note: duty cycles and limits on ambient conditions do not apply for Not-To-Exceed tests).

2. Amend subparagraph (b) as follows:

2.1 Introductory paragraph, subparagraphs (b)(1) through (b)(4): [No change.]

2.2 Amend subparagraph (b)(5) as follows: For particulate matter only from 2005 and 2006 model year engines, speed and load points determined by one of the following methods, whichever is applicable, shall be excluded from the Not-To-Exceed Control Area. B and C engine speeds shall be determined according to the provisions of § 86.1360-2007(c): [No change to remainder of paragraph.]

2.3 Amend subparagraphs (b)(6) and (b)(7) as follows: [No change except that these requirements apply for 2007 and subsequent model year engines.]

3. Subparagraph (c) [No change.]

4. Amend subparagraph (d) as follows: Not-to-exceed control area caps.

4.1 Amend subparagraph (d)(1) as follows: Add the following introductory sentence to subparagraph (d)(1): When operated within the Not-To-Exceed Control Area defined in paragraph (b) of this section, diesel engine emissions shall not exceed the applicable Not-To-Exceed Limits specified below when averaged over any time period greater than or equal to 30 seconds, except where a longer minimum averaging period is required by paragraph (d)(2) of this section.

(i)The emission caps specified in this section shall be rounded to the same number of significant figures as the applicable standards in Part I.11 of these test procedures using ASTM E29-93a.

(ii) For 2005 and 2006 model year engines, when operated within the Not-To-Exceed Control Area defined in paragraph (b) of this section, diesel engine brake-specific exhaust emissions in grams/bhp-hr (as determined under paragraphs (b) and (c) of this section), for each regulated pollutant, shall not exceed 1.25 times the applicable emission standards specified in Part I.11 of these

test procedures during engine and vehicle operation specified in paragraph (e)(1) of this section, except as noted in paragraph (e)(2) of this section, when averaged over any period of time greater than or equal to 30 seconds, except where a longer averaging period is required by paragraph (d)(2) of this section.

(iii) For 2007 and subsequent model year engines having a NOx FEL less than 1.50 g/bhp-hr, the brake-specific exhaust NMHC or NOx emissions in g/bhp-hr, as determined under Sec. 86.1370-2007 pertaining to the NTE test procedures, shall not exceed 1.5 times the applicable NMHC or NOx emission standards or FELs specified in Part I.11 of these test procedures, during engine and vehicle operation specified in subdivisions (b), (e), (f), and B.1 of this section when averaged over any period of time greater than or equal to 30 seconds, except where a longer averaging period is required by paragraph (d)(2) of this section.

(iv) For 2007 and subsequent model year engines not having a NOx FEL less than 1.50 g/bhp-hr, the brake-specific NOx and NMHC exhaust emissions in g/bhp-hr, as determined under Sec. 86.1370-2007 pertaining to the not-to-exceed test procedures, shall not exceed 1.25 times the applicable emission standards or FELs specified in Part I.11 of these test procedures during engine and vehicle operation specified in paragraphs (b), (e), (f), and (g) of this section when averaged over any period of time greater than or equal to 30 seconds, except where a longer averaging period is required by paragraph (d)(2) of this section.

(v) For 2007 and subsequent model year engines, the brake-specific exhaust PM emissions in g/bhp-hr, as determined under Sec. 86.1370-2007 pertaining to the not-to-exceed test procedures, shall not exceed 1.5 times the applicable PM emission standards or FEL (for FELs above the standard only) specified in Part I.11 of these test procedures, during engine and vehicle operation specified in paragraphs (b), (e), (f), and B.1 of this section when averaged over any period of time greater than or equal to 30 seconds, except where a longer averaging period is required by paragraph (d)(2) of this section.

4.2 Subparagraph (d)(2) [No change.]

4.3 Add the following subparagraph (d)(3): For 2005 and subsequent model year heavy-duty engines, operation within the Not-to-Exceed control area (defined in paragraph (b) of this section) must also comply with the

following:

(i) A filter smoke number of 1.0 under steady-state operation, or the following alternate opacity limits:

(A) A 30 second transient test average opacity limit of 4% for a 5 inch path; and

(B) A 10 second steady state test average opacity limit of 4% for a 5 inch path.

(ii) The limits set forth in paragraph (d)(3)(i) of this section refer to exhaust smoke emissions generated under the conditions set forth in paragraphs (b) and (e) of this section and calculated in accordance with the procedures set forth in §86.1372-2007.

5. Amend subparagraph (e) as follows: Ambient corrections.

5.1 Introductory paragraph: [No change.]

5.2 Subparagraph (e)(1) For engines operating within the ambient conditions specified in paragraph B.1.1 of this section. [No change to remainder of paragraph.]

5.3 Amend subparagraph (e)(2) as follows: For engines operating within the ambient conditions specified in paragraph B.1.2 of this section; [No change to remainder of section.]

6. Amend subparagraph (f) as follows: NTE cold temperature operating exclusion. 2007 and subsequent model year engines equipped with exhaust gas recirculation (EGR) whose operation within the NTE control area specified in §86.1370(b) when operating during cold temperature conditions as specified in paragraph (f)(1) of this section are not subject to the NTE emission limits during the specified cold temperature operation conditions. [No change to remainder of section.]

7. Subparagraph (g). NOx and NMHC aftertreatment warm-up. [No change.]

B. California provisions.

1. Ambient operating regions. For each engine family, the not-to-exceed emission limits must apply during one of the following two ambient operating regions;

1.1 The not-to-exceed emission limits apply for all altitudes less than or equal to 5,500 feet above sea-level, during all ambient conditions (temperature and humidity). Temperature and humidity ranges for which correction factors are allowed are specified in paragraph (e) of this section; or

1.2 The not-to-exceed emission limits apply at all altitudes less than or equal to 5,500 feet above sea-level, for temperatures less than or equal to

the temperature determined by the following equation at the specified altitude;

$$T = -0.00254 \times A + 100$$

Where:

T = ambient air temperature in degrees Fahrenheit
A = altitude in feet above sea-level (A is negative for altitudes below sea-level)

Temperature and humidity ranges for which correction factors are allowed are specified in section (e).

2. In-Use Compliance. The procedures for in-use voluntary and influenced recall for heavy-duty diesel engines under this section are described in title 13, CCR §§ 2111 through 2140, except as modified by this paragraph for 2005 and 2006 model year engines. In evaluating the scope of the affected population for the purposes of this section, there shall be a rebuttable presumption that the affected population is the engine family to which the tested engines belong. No engine may be used to establish the existence of an emissions exceedance if the engine or vehicle in which it was installed was subject to abuse or improper maintenance or operation, or if the engine was improperly installed, and such acts or omissions caused the exceedance.

2.1 For the purposes of this section, an exceedance of the emission testing caps occurs when the average emissions of the test vehicles or engines, pursuant to title 13, CCR § 2139, for any pollutant exceed the emission threshold. For the purposes of this section, emission threshold is defined as:

(i) for a test using vehicle test equipment (e.g., an over-the-road mobile monitoring device such as “ROVER”, or a chassis dynamometer), the applicable maximum NOx emissions limit plus the greater of 0.5 g/bhp-hr or one standard deviation of the data set established pursuant to paragraph B.2(2) of this section; or

(ii) for a test using an engine dynamometer, the applicable maximum NOx emissions limit plus 0.5 g/bph-hr.

2.2 Where an engine dynamometer or vehicle test shows an apparent exceedance of the emissions threshold, the party conducting the original test shall repeat such test under the same conditions at least nine times. The mean of the tests shall be used for the averaging of the test vehicle emissions in determining compliance.

2.3 If the average emissions of the test vehicles exceed the emissions threshold, the Executive Officer shall notify the manufacturer in writing of the test results. The manufacturer has the option to submit an influenced recall plan in accordance with title 13, CCR §§ 2113 through 2121 within 45 days or to proceed with performing the engineering analysis and/or conducting further

testing in accordance with paragraphs B.2.4 and/or B.2.5 of this section. Upon the completion of testing conducted in paragraph(s) B.2.2 and/or B.2.5, if the test results indicate that the average emissions of the test vehicles exceeds the emissions threshold, the Executive Officer shall notify the manufacturer in writing of the test results and upon receipt of the notification, the manufacturer shall have 45 days to submit an influenced recall plan in accordance with title 13, CCR §§ 2113 through 2121.

2.4 If the testing conducted under paragraph B.2.1 and title 13, CCR § 2139 was performed using vehicle test equipment, then the engine manufacturer may elect to conduct additional tests of that engine using an engine dynamometer, provided that all environmental and engine operating conditions present during vehicle testing under paragraph B.2.1 and title 13, CCR § 2139 can be reproduced or corrected consistent with paragraph B.2.6 of this section. If the engine manufacturer elects to conduct such additional engine dynamometer tests, it shall provide ARB with at least three business days notice prior to commencement of such testing. If based on such additional tests the engine exceeds the emission threshold, the engine manufacturer may conduct further testing in accordance with paragraph B.2.5 of this section and/or perform an engineering analysis to determine the percentage of the affected population that exceeds the emissions threshold and the emission levels of the exceeding engines. However, the manufacturer may not determine the percentage of the affected population or the emission levels solely on the basis of an engineering analysis unless it demonstrates to the Executive Officer's satisfaction that such analysis alone is sufficient under the circumstances.

2.5 Within 60 days of receiving notice of an exceedance under paragraph B.2.3 of this section, the manufacturer may commence testing of not less than ten additional in-service engines. The manufacturer may conduct these tests using vehicle testing equipment, or using an engine dynamometer, at the manufacturer's option.

2.6 The testing of additional engines under paragraphs B.2.4 and B.2.5 of this section shall be conducted under conditions that are no less stringent than the initial test in terms of those parameters that may affect the result, and, at the manufacturer's option, may be limited to those emission limits and conditions for which apparent exceedances have been identified. Such parameters typically, but not necessarily, include relevant ambient conditions, operating conditions, service history, and age of the vehicle. Prior to conducting any testing, the manufacturer shall submit a test plan to ARB for its review and approval. Within 30 days following ARB's proposed modifications, if any, the manufacturer shall incorporate the proposed modifications and implement the test plan as approved. Special conditioning of test engines shall not be permitted. Where the manufacturer elects to conduct the additional testing utilizing an engine dynamometer, it shall reproduce relevant engine operating and environmental conditions

associated with the initial exceedance, provided, however, that correction factors may be used to reproduce temperature, humidity or altitude conditions that cannot be simulated in the laboratory. Regardless of the testing equipment utilized, the test results shall be adjusted to reflect documented test systems error and/or variability in accordance with good engineering practices.

3. Deficiencies for NTE requirements.

3.1 For model years 2005 through 2009, upon application by the manufacturer, the Executive Officer may accept a HDDE as compliant with the NTE requirements even though specific requirements are not fully met. Such compliances without meeting specific requirements, or deficiencies, will be granted only if compliance would be infeasible or unreasonable considering such factors as, but not limited to: technical feasibility of the given hardware and lead time and production cycles including phase-in or phase-out of engines or vehicle designs and programmed upgrades of computers. Deficiencies will be approved on a engine model and/or horsepower rating basis within an engine family, and each approval is applicable for a single model year. A manufacturer's application must include a description of the auxiliary emission control device(s) which will be used to maintain emissions to the lowest practical level, considering the deficiency being requested, if applicable. An application for a deficiency must be made during the certification process; no deficiency will be granted to retroactively cover engines already certified.

3.2 Unmet requirements should not be carried over from the previous model year except where unreasonable hardware or software modifications would be necessary to correct the deficiency, and the manufacturer has demonstrated an acceptable level of effort toward compliance as determined by the Executive Officer. The NTE deficiency should only be seen as an allowance for minor deviations from the NTE requirements. The NTE deficiency provisions allow a manufacturer to apply for relief from the NTE emission requirements under limited conditions. ARB expects that manufacturers should have the necessary functioning emission control hardware in place to comply with the NTE.

3.3 For model years 2010 through 2013, the Executive Officer may allow up to three deficiencies per engine family. The provisions of §86.007-11 (a)(4)(iv)(A) and §86.007-11 (B) apply for deficiencies allowed by §86.007-11 (a)(4)(iv)(C). In determining whether to allow the additional deficiencies, the Executive Officer may consider any relevant factors, including the factors identified in §86.007-11 (a)(4)(iv)(A). If additional deficiencies are approved, the Executive Officer may set any additional conditions that he/she determines to be appropriate.

4. Exemptions.

4.1 The requirements set forth in this section do not apply to “ultra-small volume manufacturers” for model years 2005 and 2006. For the purposes of this section, an “ultra-small volume manufacturer” means any manufacturer with California sales less than or equal to 300 new passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles, and heavy-duty engines per model year based on the average number of vehicles and engines sold by the manufacturer in the previous three consecutive model years.

4.2 The requirements set forth in this section do not apply to “urban buses”, as defined in title 13, CCR, § 1956.2, for model years 2005 and 2006.

5. Submission of NTE deficiencies and limited testing region information. Manufacturers are not required to provide engine information exclusively related to in-use testing as part of initial certification. However, upon request from ARB, the manufacturers must provide the information which clearly identifies parameters defining all NTE deficiencies described under subparagraph B.3. of this section and parameters defining all NTE limited testing regions described under 86.1370-07(b)(6) and (7) that are requested. When requested, deficiencies and limited testing regions must be reported for all engine families and power ratings in English with sufficient detail for us to determine if a particular deficiency or limited testing region will be encountered in the emission test data from the portable emission-sampling equipment and field-testing procedures referenced in 86.1375. Such information is to be provided within 60 days of the request from ARB.

86.1372-2007 Measuring smoke emissions within the NTE zone. October 6, 2000.

This section contains the measurement techniques to be used for determining compliance with the filter smoke limit or opacity limits in §86.1370-2007 (d)(3)(i). [No change to remainder of section.]

86.1375-2007 Equipment Specifications for Field Testing. June 14, 2005. [No change.]

86.1380-2004 Load response test. October 6, 2000. [Delete]

Subpart S – General Compliance Provisions for Control of Air Pollution From New and In-Use Light-Duty Vehicles, Light-Duty Trucks, and Complete Otto-Cycle Heavy-Duty Vehicles.

86.1863-07 Optional chassis certification for diesel vehicles. September 15, 2011.

1. Amend subparagraph (a) as follows: For the 2004 through 2014 model years, a manufacturer may optionally certify heavy-duty diesel vehicles weighing 14,000 pounds GVWR or less to the emission standards specified in title 13, CCR, §1961. Such vehicles must meet all applicable requirements of the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," as incorporated by reference in title 13, CCR, §1961(d). For the 2015 through 2019 model years, a manufacturer may optionally certify heavy-duty diesel vehicles weighing 8,500 to 10,000 pounds GVWR or less to the emission standards specified in title 13, CCR, §1961 or §1961.2, as applicable. Such vehicles must meet all applicable requirements of the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," incorporated by reference in section 1961.2, title 13, CCR. For the 2015 and subsequent model years, a manufacturer may optionally certify heavy-duty diesel vehicles weighing 10,001 to 14,000 pounds GVWR or less to the emission standards specified in title 13, CCR, §1961.2. Such vehicles must meet all applicable requirements of the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," incorporated by reference in section 1961.2, title 13, CCR. For the 2020 and subsequent model years, heavy-duty diesel vehicles 8,501 to 10,000 pounds GVW must certify to the primary emission standards and test procedures for complete vehicles specified in section 1961.2, title 13, CCR.

2. Amend subparagraph (b) as follows: Diesel vehicles optionally certified under this section are subject to the OBD requirements of title 13, CCR, §1968.2.

3. Subparagraphs (c) to (g). [No change.]

4. Subparagraphs (h) and (i). [n/a]

Subpart T - Manufacturer-Run In-Use Testing Program for Heavy-Duty Diesel Engines.

86.1901 What testing requirements apply to my engines that have gone into service? November 8, 2010.

86.1905 How does this program work? November 8, 2010.

1. Subparagraphs (a) through (f). [No change.]

2. Amend subparagraph (g) as follows: For any communication related to this subpart, contact the On-Road Heavy-Duty Diesel Section Manager, Mobile Source Control Division, Air Resources Board, 9528 Telstar Avenue, El Monte, CA 91731.

86.1908 How must I select and screen my in-use engines? June 14, 2005.

1. Amend subparagraph (a) as follows:

1.1 Subparagraph (a)(1) through (a)(8). [No change.]

1.2 Amend subparagraph (a)(9) as follows: The vehicles have not exceeded the applicable useful life, in miles or years as defined in title 13, CCR, section 2112; you may otherwise not exclude engines from testing based on their age or mileage.

1.3 Subparagraph (a)(10). [No change.]

2. Subparagraph (b) through (d). [No change.]

86.1910 How must I prepare and test my in-use engines? November 8, 2010.

86.1912 How do I determine whether an engine meets the vehicle-pass criteria? November 8, 2010.

86.1915 What are the requirements for Phase 1 and Phase 2 testing? June 14, 2005.

86.1917 How does in-use testing under this subpart relate to the emission-related warranty in Section 207(a)(1) of the Clean Air Act? June 14, 2005.

1. Amend subparagraph (a) as follows: An exceedance of the NTE found through the in-use testing program under this subpart is not by itself sufficient to show a breach of warranty under title 13, CCR, section 2036. [No change to remainder of paragraph.]

2. Amend subparagraph (b) as follows: To the extent that in-use NTE testing does not reveal such a material deficiency at the time of sale in the design or manufacture of an engine compared with the certified engine, or a defect in the materials and workmanship of a component or part, test results showing an exceedance of the NTE by itself would not show a breach of warranty under title 13, CCR, section 2036.

86.1920 What in-use testing information must I report to EPA? November 8, 2010.

1. Amend subparagraph (a) as follows: Send us electronic reports using an approved information format to Chief, Emission Research and Regulatory Development Branch, Mobile Source Control Division, Air Resources Board, 9528 Telstar Avenue, El Monte, California, 91731. If you want to use a different format, send us a written request with justification.

2. Subparagraphs (b) to (c). [No change.]

3. Amend subparagraph (d) as follows: Send us an electronic notification at inuse@arb.ca.gov describing any voluntary vehicle/engine emission evaluation test you intend to conduct … [No change to remainder of paragraph.]

4. Amend subparagraph (e) as follows: Send us an electronic notification at inuse@arb.ca.gov within 15 days after your initial review of the test data for a selected engine family indicates that three engines in Phase 1 testing have failed to comply with the vehicle-pass criteria. [No change to remainder of paragraph.]

5. Subparagraphs (f) and (g). [No change.]

86.1925 What records must I keep? June 14, 2005.

86.1930 What special provisions apply from 2005 through 2009? November 8, 2010.

Appendix I to Part 86 - Urban Dynamometer Schedules.

(f)(2) EPA Engine Dynamometer Schedule for Heavy-Duty Diesel Engines. December 10, 1984.

Appendix I to Subpart T – Sample Graphical Summary of NTE Emission Results

PART 1065 – ENGINE-TESTING PROCEDURES.

Subpart A – Applicability and General Provisions

1065.1 Applicability. September 15, 2011.

1. Amend subparagraph (a) as follows:

1.1. Introductory paragraph. [No change.]

1.2. Subparagraphs (a)(1). [n/a]

1.3. Amend subparagraph (a)(2) as follows: Model year 2010 and later heavy-duty highway engines we regulate under title 13, CCR, §1956.8. For earlier model years, manufacturers may use the test procedures in this part or those specified in 40 CFR part 86, subpart N, according to §1065.10, as modified by these test procedures.

1.4. Subparagraphs (a)(3) through (a)(8). [n/a]

2. Subparagraph (b). [n/a]

3. Subparagraph (c) through (g). [No change.]

1065.2 Submitting information to EPA under this part. April 30, 2010.

1. Subparagraphs (a) through (d). [No change.]

2. Amend subparagraph (e) as follows: See title 13, CCR, section 91011 for provisions related to confidential information. Note that according to this section, emission data shall not be identified as confidential.

3. Subparagraph (f). [No change.]

1065.5 Overview of this part 1065 and its relationship to the standard-setting part. October 30, 2009.

1065.10 Other procedures. April 30, 2010.

1065.12 Approval of alternate procedures. June 30, 2008.

1065.15 Overview of procedures for laboratory and field testing. September 15, 2011.

1065.20 Units of measure and overview of calculations. September 15, 2011.

1065.25 Recordkeeping. July 13, 2005.

Subpart B – Equipment Specifications

1065.101 Overview. June 30, 2008.

1065.110 Work inputs and outputs, accessory work, and operator demand. June 30, 2008.

1065.120 Fuel properties and fuel temperature and pressure. June 30, 2008.

1065.122 Engine cooling and lubrication. June 30, 2008.

1065.125 Engine intake air. September 15, 2011.

1065.127 Exhaust gas recirculation. July 13, 2005.

1065.130 Engine exhaust. June 30, 2008.

1065.140 Dilution for gaseous and PM constituents. September 15, 2011.

1065.145 Gaseous and PM probes, transfer lines, and sampling system components. April 30, 2010.
1065.150 Continuous sampling. July 13, 2005.
1065.170 Batch sampling for gaseous and PM constituents. September 15, 2011.
1065.190 PM-stabilization and weighing environments for gravimetric analysis. September 15, 2011.
1065.195 PM-stabilization environment for in-situ analyzers. June 30, 2008.

Subpart C – Measurement Instruments

1065.201 Overview and general provisions. April 30, 2010.
1065.202 Data updating, recording, and control. July 13, 2005.
1065.205 Performance specifications for measurement instruments. September 15, 2011.

Measurement of Engine Parameters and Ambient Conditions

1065.210 Work input and output sensors. June 30, 2008.
1065.215 Pressure transducers, temperature sensors, and dewpoint sensors. June 30, 2008.

Flow-Related Measurements

1065.220 Fuel flow meter. June 30, 2008.
1065.225 Intake-air flow meter. September 15, 2011.
1065.230 Raw exhaust flow meter. July 13, 2005.
1065.240 Dilution air and diluted exhaust flow meters. April 30, 2010.
1065.245 Sample flow meter for batch sampling. July 13, 2005.
1065.248 Gas divider. July 13, 2005.

CO and CO_2 Measurements

1065.250 Nondispersive infra-red analyzer. September 15, 2011.

Hydrocarbon Measurements

1065.260 Flame ionization detector. September 15, 2011.
1065.265 Nonmethane cutter. September 15, 2011.
1065.267 Gas chromatograph. September 15, 2011.

NOx Measurements

1065.270 Chemiluminescent detector. September 15, 2011.
1065.272 Nondispersive ultraviolet analyzer. September 15, 2011.
1065.275 N_2O measurement devices. September 15, 2011.

O_2 Measurements

1065.280 Paramagnetic and magnetopneumatic O_2 detection analyzers. September 15, 2011.

Air-to Fuel Ratio Measurements

1065.284 Zirconia (ZrO_2) analyzer. September 15, 2011.

PM Measurements

1065.290 PM gravimetric balance. November 8, 2010.
1065.295 PM inertial balance for field-testing analysis. September 15, 2011.

Subpart D – Calibrations and Verifications

1065.301 Overview and general provisions. July 13, 2005.
1065.303 Summary of required calibration and verifications. September 15, 2011.
1065.305 Verifications for accuracy, repeatability, and noise. April 30, 2010.
1065.307 Linearity verification. September 15, 2011.
1065.308 Continuous gas analyzer system-response and updating-recording verification. October 8, 2008.
1065.309 Continuous gas analyzer uniform response verification. April 30, 2010.

Measurement of Engine Parameters and Ambient Conditions

1065.310 Torque calibration. June 30, 2008.
1065.315 Pressure, temperature, and dewpoint calibration. April 30, 2010.

Flow-Related Measurements

1065.320 Fuel-flow calibration. July 13, 2005.
1065.325 Intake-flow calibration. July 13, 2005.
1065.330 Exhaust-flow calibration. July 13, 2005.
1065.340 Diluted exhaust flow (CVS) calibration. September 15, 2011.
1065.341 CVS and batch sampler verification (propane check). September 15, 2011.
1065.342 Sample dryer verification. April 30, 2010.
1065.345 Vacuum-side leak verification. April 30, 2010.

CO and CO_2 Measurements

1065.350 H_2O interference verification for CO_2 NDIR analyzers. September 15, 2011.
1065.355 H_2O and CO_2 interference verification for CO NDIR analyzers. April 30, 2010.

Hydrocarbon Measurements

1065.360 FID optimization and verification. September 15, 2011.
1065.362 Non-stoichiometric raw exhaust FID O2 interference verification. June 30, 2008.
1065.365 Nonmethane cutter penetration fractions. October 30, 2009.

NOx Measurements

1065.370 CLD CO_2 and H_2O quench verification. September 15, 2011.
1065.372 NDUV analyzer HC and H_2O interference verification. September 15, 2011.
1065.376 Chiller NO_2 penetration. June 30, 2008.
1065.378 NO_2-to-NO converter conversion verification. September 15, 2011.

PM Measurements

1065.390 PM balance verifications and weighing process verification. November 8, 2010.
1065.395 Inertial PM balance verifications. July 13, 2005.

Subpart E – Engine Selection, Preparation, and Maintenance

1065.401 Test engine selection. July 13, 2005.
1065.405 Test engine preparation and maintenance. June 30, 2008.
1065.410 Maintenance limits for stabilized test engines. June 30, 2008.
1065.415 Durability demonstration. June 30, 2008.

Subpart F – Performing an Emission Test in the Laboratory

1065.501 Overview. April 30, 2010.
1065.510 Engine mapping. September 15, 2011.
1065.512 Duty cycle generation. October 8, 2008.
1065.514 Cycle-validation criteria. September 15, 2011.
1065.520 Pre-test verification procedures and pre-test data collection. September 15, 2011.
1065.525 Engine starting, restarting, and shutdown. September 15, 2011.
1065.526 Repeating void modes or test intervals. November 8, 2010.
1065.530 Emission test sequence. September 15, 2011.
1065.545 Validation of proportional flow control for batch sampling. April 30, 2010.
1065.546 Validation of minimum dilution ratio for PM batch sampling and drift correction. September 15, 2011.
1065.550 Gas analyzer range validation, drift validation, and drift correction. September 15, 2011.
1065.590 PM sample preconditioning and tare weighing. June 30, 2008.
1065.595 PM sample post-conditioning and total weighing. June 30, 2008.

Subpart G – Calculations and Data Requirements

1065.601 Overview. April 30, 2010.
1065.602 Statistics. September 15, 2011.
1065.610 Duty cycle generation. September 15, 2011.
1065.630 1980 international gravity formula. July 13, 2005.
1065.640 Flow meter calibration calculations. September 15, 2011.
1065.642 SSV, CFV, and PDP molar flow rate calculations. September 15, 2011.
1065.645 Amount of water in an ideal gas. September 15, 2011.
1065.650 Emission calculations. September 15, 2011.
1065.655 Chemical balances of fuel, intake air, and exhaust. September 15, 2011.
1065.659 Removed water correction. September 15, 2011.
1065.660 THC and NMHC determination. September 15, 2011.
1065.665 THCE and NMHCE determination. June 30, 2008.
1065.667 Dilution air background emission correction. September 15, 2011.

1065.670 NOx intake-air humidity and temperature corrections. September 15, 2011.
1065.672 Drift correction. April 30, 2010.
1065.675 CLD quench verification calculations. September 15, 2011.
1065.690 Buoyancy correction for PM sample media. April 30, 2010.
1065.695 Data requirements. June 30, 2008.

Subpart H – Engine Fluids, Test Fuels, Analytical Gases and Other Calibration Standards

1065.701 General requirements for test fuels. April 30, 2010.

A. Federal provisions.

1. Subparagraph (a). [No change.]

2. Amend subparagraph (b) as follows: *Fuels meeting alternative specifications.* We may allow you to use a different test fuel if you show us and we find that using it does not affect your ability to comply with all applicable emission standards using commercially available fuels.

3. Subparagraph (c). [No change.]

4. Amend subparagraph (d) as follows: *Fuel specifications*. The fuel parameters specified in this subpart depend on measurement procedures that are incorporated by reference.

5. Subparagraph (e). [No change.]

6. Subparagraph (f). [No change.]

B. California provisions.

1. Methanol Fuel.

1.1 Exhaust emission test fuel. For diesel alcohol vehicles and hybrid electric vehicles which use diesel alcohol engines, methanol or ethanol fuel used for exhaust and evaporative emission testing shall meet the specifications set forth in title 13, CCR, section 2292.1 (Specifications for M-100 Fuel Methanol) or section 2292.3 (Specification for E-100 Fuel Ethanol) as modified by the following:

Specification	Limit
M-100 Fuel Methanol	
Methanol	98.0 ± 0.5 vol. percent
Ethanol	1.0 vol. Percent (max.)
Petroleum fuel meeting the specifications of 40 CFR §86.1313-98	1.0 ± 0.1 vol. percent
E-100 Fuel Ethanol	
Ethanol	98.0 ± 0.5 vol. percent
Methanol	1.0 vol. Percent (max.)
Petroleum fuel meeting the specifications of 40 CFR §86.1313-98	1.0 ± 0.1 vol. percent

1.2 **Mileage accumulation fuel.** For diesel alcohol vehicles and hybrid electric vehicles which use diesel alcohol engines, methanol or ethanol fuel used for service accumulation shall meet the applicable specifications set forth in title 13, CCR, section 2292.1 (Specifications for M-100 Fuel Methanol) or section 2292.3 (Specification for E-100 Fuel Ethanol).

1.3 The specification range of the fuels to be used under this section 1 shall be reported in accordance with §86.094-21.

1.4 Fuel additives and ignition improvers intended for use in alcohol test fuels shall be subject to the approval of the Executive Officer. In order for such approval to be granted, a manufacturer must demonstrate that emissions will not be adversely affected by the use of the fuel additive or ignition improver.

2. **Mixtures Of Petroleum and Methanol Fuels for Flexible Fuel Vehicles.**

2.1 **Exhaust emission test fuel for emission-data and durability-data vehicles**. For diesel alcohol vehicles and hybrid electric vehicles which use diesel alcohol engines, methanol or ethanol fuel used for exhaust emission testing shall meet the applicable specifications set forth in title 13, CCR, section 2292.2 (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specifications for E-85 Fuel Ethanol) as modified by the following:

Specification	Limit
M-85 Fuel Methanol	
Petroleum fuel meeting the specifications of 40 CFR §86.1313-98	13-16 vol. percent
Reid vapor pressure	8.0-8.5 psi, using common blending components from the gasoline stream.
E-85 Fuel Ethanol	
Petroleum fuel meeting the specifications of 40 CFR §86.1313-98	15-21 vol. percent
Reid vapor pressure	8.0-8.5 psi, using common blending components from the gasoline stream.

2.2 **Mileage accumulation fuel.** For flexible fuel diesel alcohol vehicles and hybrid electric vehicles that use diesel alcohol engines, petroleum fuel shall meet the applicable specifications in §86.1313-98(a) or (b), as modified by these test procedures, and methanol or ethanol fuel shall meet the applicable specifications set forth in title 13, CCR, section 2292.2 (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specification for E-85 Fuel Ethanol). Mileage accumulation procedures shall be subject to the requirements set forth in §§ 86.001-26 and 86.1831-01(a) and (b) and are subject to the prior approval of the Executive Officer. A manufacturer shall consider expected customer fuel usage as well as emission deterioration when developing its durability demonstration.

2.3 **Evaporative emission test fuel for emission-data and durability data vehicles.** For diesel alcohol vehicles and hybrid electric vehicles, which use diesel alcohol engines, a blend of methanol or ethanol fuel used for evaporative emission testing shall meet the applicable specifications set forth in title 13, CCR, section 2292.2 (Specifications for M-85 Fuel Methanol) or section 2292.4 (Specifications for E-85 Fuel Ethanol) and gasoline meeting the specifications of 86.1313-94 (a)(1), as modified by these test procedures, such that the final blend is composed of either 35 volume percent methanol (1.0 volume percent of total blend) for methanol-fueled vehicles or 10 volume percent ethanol (1.0 volume percent of total blend) for ethanol-fueled vehicles. Alternative alcohol-gasoline blends may be used in place of M35 or E10 if demonstrated to result in equivalent or higher evaporative emissions, subject to prior approval of the Executive Officer.

2.4 The specification range of the fuels to be used in this section 2 shall be reported in accordance with §86.094-21.

2.5 Fuel additives and ignition improvers intended for use in alcohol test

fuels shall be subject to the approval of the Executive Officer. In order for such approval to be granted, a manufacturer must demonstrate that emissions will not be adversely affected by the use of the fuel additive or ignition improver.

3. **Identification of New Clean Fuels to be Used in Certification Testing.** Any person may petition the state board to establish by regulation certification testing specifications for a new clean fuel for which specifications for the new clean fuel are not specifically set forth in paragraph §86.1313-98 as amended herein. Prior to adopting such specifications, the state board shall consider the relative cost-effectiveness of use of the fuel in reducing emissions compared to the use of other fuels. Whenever the state board adopts specifications for a new clean fuel for certification testing, it shall also establish by regulation specifications for the fuel as it is sold commercially to the public.

(a) If the proposed new clean fuel may be used to fuel existing motor vehicles, the state board shall not establish certification specifications for the fuel unless the petitioner has demonstrated that:

(1) Use of the new clean fuel in such existing motor vehicles would not increase emissions of NMHC, NOx, and CO, and the potential risk associated with toxic air contaminants, as determined pursuant to the procedures set forth in the "California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels through 2014" or the "California Test Procedures for Evaluating Substitute Fuels and New Clean Fuels in 2015 and Subsequent Years," which are incorporated by reference in title 13, CCR, §2317, as applicable. In the case of fuel-flexible vehicles or dual-fuel vehicles that were not certified on the new clean fuel but are capable of being operated on it, exhaust and evaporative emissions from the use of the new clean fuel shall not increase compared to exhaust and evaporative emissions from the use of gasoline that complies with Title 13, Division 3, Chapter 5, Article 1, California Code of Regulations.

(2) Use of the new clean fuel in such existing motor vehicles would not result in increased deterioration of the vehicle and would not void the warranties of any such vehicles.

(b) Whenever the state board designates a new clean fuel pursuant to this section, the state board shall also establish by regulation required specifications for the new clean fuel sold commercially in California.

1065.703 Distillate diesel fuel. April 30, 2010.

1. Subparagraph (a) [No change.]

2. Delete subparagraph (b) and replace with the following:

(b)(1) Use the ultra low sulfur grade test fuel as specified in Table 1 of §1065.703.

(b)(2) Diesel test fuel having the specifications listed below in the table may

be used in exhaust emission testing as an option to the specifications in Table 1 of §1065.703. If a manufacturer elects to use this option, the Executive Officer shall conduct exhaust emission testing with diesel fuel having the specifications listed below.

Diesel Fuel Specification	**Limit**	**Test Method[a]**
Natural Cetane Number	47-55	D613-86
Distillation Range, ^{o}F		Title 13 CCR, §2282(g)(3)
IBP	340-420	
10% point	400-490	
50% point	470-560	
90% point	550-610	
EP	580-660	
API Gravity, degrees	33-39	D287-82
Total Sulfur, ppm	7-15	Title 13 CCR, §2282(g)(3)
Nitrogen Content, ppmw	100-500	Title 13 CCR, §2282(g)(3)
Total Aromatic Hydrocarbons, vol.%	8-12	Title 13 CCR, §2282(g)(3)
Polycyclic Aromatic Hydrocarbons, wt.% (max.)	1.4	Title 13 CCR, §2282(g)(3)
Flashpoint, ^{o}F (max)	130	D 93-80
Viscosity @ 40°C, centistokes	2.0-4.1	D 445-83

[a] ASTM specifications unless otherwise noted. A reference to a subsection of title 13, CCR, §2282 means the test method identified in that subsection for the particular property. A test method other than that specified may be used following a determination by the Executive Officer that the other method produces results equivalent to the results of the specified method.

3. Subparagraph (c) [No change.]

1065.705 Residual fuel. June 30, 2008. [No change.]
1065.710 Gasoline. June 30, 2008. [n/a]
1065.715 Natural gas. June 30, 2008.

1. Delete subparagraph (a) and replace with the following:

(a)(1) **Exhaust emission test fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use natural gas, fuel used for exhaust and evaporative emission testing shall meet the specifications listed in title 13, CCR, section 2292.5 (Specifications for Compressed Natural Gas) as modified by the following:

Specification	**Limit**
Compressed Natural Gas Certification Test Fuel	
Methane	90.0 ± 1.0 mole percent
Ethane	4.0 ± 0.5 mole percent
C_3 and higher hydrocarbon content	2.0 ± 0.3 mole percent
Oxygen	0.5 mole percent maximum
Inert gases (CO_2 + N_2)	3.5 ± 0.5 vol. percent

(a)(2) **Mileage accumulation fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use natural gas, fuel used for service accumulation shall meet the specifications listed in title 13, CCR, section 2292.5 (Specifications for Compressed Natural Gas).

(a)(3) The specification range of the fuels to be used in this section (a) shall be reported in accordance with §86.094-21.

2. Subparargraphs (b) through (d) [No change.]

1065.720 Liquefied petroleum gas. July 13, 2005.

1. Delete subparagraph (a) and replace with the following:

(a)(1) **Evaporative and exhaust emission test fuel.** For dedicated, dual-fueled or hybrid electric vehicles which use liquefied petroleum gas, fuel used for exhaust and evaporative emission testing shall meet the specifications listed in title 13, CCR, section 2292.6 (Specifications for Liquefied Petroleum Gas) as modified by the following:

Specification	**Limit**
Liquefied Petroleum Gas Certification Test Fuel	
Propane	93.5 ± 1.0 volume percent
Propene	3.8 ± 0.5 volume percent
Butane and heavier components	1.9 ± 0.3 volume percent

(a)(2) Mileage accumulation fuel. For dedicated, dual-fueled or hybrid electric vehicles which use liquefied petroleum gas, fuel used for service accumulation shall meet the specifications listed in title 13, CCR, section 2292.6 (Specifications for Liquefied Petroleum Gas).

(a)(3) The specification range of the fuels to be used in this section (a) shall be measured in accordance with ASTM D2163-91 and reported in accordance with §86.094-21.

2. Subparagraph (b) through (d) [No change.]

1065.740 Lubricants. July 13, 2005.
1065.745 Coolants. July 13, 2005.
1065.750 Analytical gases. September 15, 2011.
1065.790 Mass standards. September 15, 2011.

Subpart I –Testing with Oxygenated Fuels

1065.801 Applicability. July 13, 2005.
1065.805 Sampling system. June 30, 2008.
1065.845 Response factor determination. April 30, 2010.
1065.850 Calculations. July 13, 2005.

Subpart J – Field Testing and Portable Emission Measurement Systems

1065.901 Applicability. June 30, 2008.
1065.905 General provisions. November 8, 2010.
1065.910 PEMS auxiliary equipment for field testing. April 30, 2010.
1065.915 PEMS instruments. September 15, 2011.
1065.920 PEMS calibrations and verifications. November 8, 2010.
1065.925 PEMS preparation for field testing. September 15, 2011.
1065.930 Engine starting, restarting, and shutdown. July 13, 2005.
1065.935 Emission test sequence for field testing. June 30, 2008.
1065.940 Emission calculations. November 8, 2010.

Subpart K – Definitions and Other Reference Information

1065.1001 Definitions. September 15, 2011.

1. Amend the definition of "Designated Compliance Officer" as follows: *Designated Compliance Officer* means the Executive Officer of the Air Resources Board or a designee of the Executive Officer.

1065.1005 Symbols, abbreviations, acronyms, and units of measure. September 15, 2011.
1065.1010 Reference materials. September 15, 2011.