ENCLOSURE C

California Environmental Protection Agency
AIR RESOURCES BOARD

PROPOSED 15-DAY MODIFICATIONS

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

Adopted: [INSERT DATE OF ADOPTION]

NOTE: The following text contains staff's suggested modifications to these test procedures as originally proposed December 7, 2011. Modifications to the originally proposed language made available in connection with this "15-Day Notice" are shown in double underline to indicate additions and ~~double strikeout~~ to indicate deletions compared to the test procedures as proposed December 7, 2011. Staff is proposing modifications to limited portions of the original proposal; for some portions where no modifications are proposed the text has been omitted and the omission indicated by "* * * *" or [No change].

Amend "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," as incorporated by reference in Title 13, California Code of Regulations, Section 1961.2(d) to read:

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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

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

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B. Definitions, Acronyms and Abbreviations

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2. California Definitions.

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"**Small volume manufacturer**" means any manufacturer whose projected or combined California sales of passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles and heavy-duty engines in its product line 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. A manufacturer's California sales shall consist of all vehicles or engines produced by the manufacturer and delivered for sale in California, except that vehicles or engines produced by the manufacturer and marketed in California by another manufacturer under the other manufacturer's nameplate shall be treated as California sales of the marketing manufacturer.

Except as provided in the last paragraph of this definition, ~~F~~for the 2015 through 2017 model years, the annual sales from different firms shall be aggregated in the following situations: (1) vehicles produced by two or more firms, one of which is 10% or greater part owned by another; or (2) vehicles produced by any two or more firms if a third party has equity ownership of 10% or more in each of the firms; or (3) vehicles produced by two or more firms having a common corporate officer(s) who is (are) responsible for the overall direction of the companies;

or (4) vehicles imported or distributed by any firms where the vehicles are manufactured by the same entity and the importer or distributor is an authorized agent of the entity.

Except as provided in the last paragraph of this definition, ~~F~~for the 2018 and subsequent model years, the annual sales from different firms shall be aggregated in the following situations: (1) vehicles produced by two or more firms, one of which is 33.4% or greater part owned by another; or (2) vehicles produced by any two or more firms if a third party has equity ownership of 33.4% or more in each of the firms; or (3) vehicles produced by two or more firms having a common corporate officer(s) who is (are) responsible for the overall direction of the companies; or (4) vehicles imported or distributed by any firms where the vehicles are manufactured by the same entity and the importer or distributor is an authorized agent of the entity.

For the purposes of this paragraph, all manufacturers whose annual sales are aggregated together under the provisions of this definition shall be defined as "related manufacturers." Notwithstanding such aggregation, the Executive Officer may make a determination of operational independence if all of the following criteria are met for at least 24 months preceding the application submittal: (1) for the three years preceding the year in which the initial application is submitted, the average California sales for the applicant does not exceed 4,500 vehicles per year; (2) no financial or other support of economic value is provided by related manufacturers for purposes of design, parts procurement, R&D and production facilities and operation, and any other transactions between related manufacturers are conducted under normal commercial arrangements like those conducted with other parties, at competitive pricing rates to the manufacturer; (3) related manufacturers maintain separate and independent research and development, testing, and production facilities; (4) related manufacturers do not use any vehicle powertrains or platforms developed or produced by related manufacturers; (5) patents are not held jointly with related manufacturers; (6) related manufacturers maintain separate business administration, legal, purchasing, sales, and marketing departments, as well as autonomous decision-making on commercial matters; (7) the overlap of the Board of Directors between related manufacturers is limited to 25% with no sharing of top operational management, including president, chief executive officer, chief financial officer, and chief operating officer, and provided that no individual overlapping director or combination of overlapping directors exercises exclusive management control over either or both companies; and (8) parts or components supply between related companies must be established through open market process, and to the extent that the manufacturer sells parts/components to non-related manufacturers, it does so through the open market a competitive pricing. Any manufacturer applying for operational independence must submit to ARB an Attestation Engagement from an independent certified public accountant or firm of such accountants verifying the accuracy of the information contained in the application, as defined by and in accordance with the procedures established in 40 C.F.R. §80.125, as last amended January 19, 2007, which is incorporated by reference in section 1900, title 13, CCR. The applicant must submit information to update any of the above eight criteria as material changes to any of the criteria occur. If there are no material changes to any of the criteria, the applicant must certify that to the Executive Officer annually. With respect to any such changes, the Executive Officer may consider extraordinary conditions (e.g., changes to economic conditions, unanticipated market changes, etc.) and may continue to find the applicant to be operationally independent. In the event that a manufacturer loses eligibility as a "small volume manufacturer" after a material change occurs, the manufacturer must begin compliance with the primary emissions program in the third model year after the model year in

which the manufacturer loses its eligibility. The Executive Officer may, in his or her discretion, re-establish lost "small volume manufacturer" status if the manufacturer shows that it has met the operational independence criteria for three consecutive years.

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D. §86.1810 General standards; increase in emissions; unsafe conditions; waivers

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2. Supplemental FTP General Provisions for California.

2.1 Amend 40 CFR §86.1810-09(i) as follows:

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2.1.4 Delete subparagraph (6); replace with: **Air to Fuel Ratio Requirement.** With the exception of cold-start conditions, warm-up conditions and rapid-throttle motion conditions ("tip-in" or "tip-out" conditions), the air to fuel ratio shall not be richer at any time than, for a given engine operating condition (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters), the leanest air to fuel mixture required to obtain maximum torque (lean best torque), with a tolerance of ~~three~~ six percent of the fuel consumption. ~~The emission control system shall remain in the operating mode producing the best balance of HC, CO, and NOx catalyst efficiency (e.g. closed loop/stoichiometric operation on 3-way catalyst systems) under all conditions, except when required for engine component temperature protection, driver power request, start enrichment requirements, fuel shut-off situations (decelerations, rev limiter, torque management, etc.), or certain component malfunctions preventing safe closed-loop operation.~~ The Executive Officer may approve a manufacturer's request for approval to use additional enrichment in subsequent testing if the manufacturer demonstrates that additional enrichment is needed to protect the vehicle, occupants, engine, or emission control hardware.

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2.1.6 Delete subparagraph (8); ~~replace with: **Small Volume Provisions.** Small volume manufacturers of PCs, LDTs, and MDVs shall certify 100% of their PC, LDT, and MDV fleet in 2022 and subsequent model years under the 150,000-mile SFTP requirements in section E.1.2.2.~~

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2.2 For gasoline and diesel-fueled LEV II and LEV III vehicles, manufacturers may measure non-methane hydrocarbons (NMHC) in lieu of NMOG. Manufacturers shall multiply NMHC measurements by an adjustment factor of 1.03 before adding it to the measured NOx emissions and comparing with the NMOG+NOx standard to determine compliance with that standard.

E. California Exhaust Emission Standards.

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1. Exhaust Emission Standards.

1.1 FTP Exhaust Emission Standards for Light- and Medium-Duty Vehicles.

The exhaust emission standards set forth in this section refer to the exhaust emitted over the driving schedule set forth in title 40, CFR, Subparts B and C, except as amended in these test procedures.

1.1.1 **LEV II Exhaust Standards.** The following LEV II standards are the maximum exhaust emissions for the intermediate and full useful life from new ~~2004~~ 2015 through 2019 model year LEVs, ULEVs, and SULEVs, including fuel-flexible, bi-fuel and dual fuel vehicles when operating on the gaseous or alcohol fuel they are designed to use, except that for the 2015 through 2019 model years, SULEV exhaust standards shall only apply to vehicles that receive partial zero-emission vehicle credits according to the criteria set forth in section C.3 of the "California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes" or the "California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," incorporated by reference in section 1962.2, title 13, CCR. Vehicles that are certified to the particulate standards in section E.1.1.2.1 may not certify to LEV II standards.

2015 – 2019 model-year LEV II LEV vehicles may be certified to the NMOG+NOx numerical values for LEV160, LEV395, or LEV630, as applicable, in section E.1.1.2 and the corresponding NMOG+NOx numerical values in section E.1.4.2, in lieu of the separate NMOG and NOx exhaust emission standards in this section E.1.1.1 and the corresponding NMOG+NOx numerical values in section E.1.4.1; LEV II ULEV vehicles may be certified to the NMOG+NOx numerical values for ULEV125, ULEV340, or ULEV570, as applicable, in section E.1.1.2 and the corresponding NMOG+NOx numerical values in section E.1.4.2, in lieu of the separate NMOG and NOx exhaust emission standards in this section E.1.1.1 and the corresponding NMOG+NOx numerical values in section E.1.4.1; and LEV II SULEV vehicles may be certified to the NMOG+NOx numerical values for SULEV30, SULEV170, or SULEV230, as applicable, in section E.1.1.2 and the corresponding NMOG+NOx numerical values in section E.1.4.2, in lieu of the separate NMOG and NOx exhaust emission standards in this section E.1.1.1 and the corresponding NMOG+NOx numerical values in section E.1.4.1.

LEV II Exhaust Mass Emission Standards for New ~~2004~~ 2015 Through 2019 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicle							
Vehicle Type	Durability Vehicle Basis (mi)	Vehicle Emission Category	NMOG (g/mi)	Carbon Monoxide (g/mi)	Oxides of Nitrogen (g/mi)	Formaldehyde (mg/mi)	Particulates (g/mi)
All PCs; LDTs 8,500 lbs. GVWR or less Vehicles in this category are tested at their loaded vehicle weight.	50,000	LEV	0.075	3.4	0.05	15	n/a
		LEV, Option 1	0.075	3.4	0.07	15	n/a
		ULEV	0.040	1.7	0.05	8	n/a
	120,000	LEV	0.090	4.2	0.07	18	0.01
		LEV, Option 1	0.090	4.2	0.10	18	0.01
		ULEV	0.055	2.1	0.07	11	0.01
		SULEV	0.010	1.0	0.02	4	0.01
	150,000 (optional)	LEV	0.090	4.2	0.07	18	0.01
		LEV, Option 1	0.090	4.2	0.10	18	0.01
		ULEV	0.055	2.1	0.07	11	0.01
		SULEV	0.010	1.0	0.02	4	0.01
MDVs 8,501 - 10,000 lbs. GVWR Vehicles in this category are tested at their adjusted loaded vehicle weight.	120,000	LEV	0.195	6.4	0.2	32	0.12
		ULEV	0.143	6.4	0.2	16	0.06
		SULEV	0.100	3.2	0.1	8	0.06
	150,000 (Optional)	LEV	0.195	6.4	0.2	32	0.12
		ULEV	0.143	6.4	0.2	16	0.06
		SULEV	0.100	3.2	0.1	8	0.06

Vehicle Type	Durability Vehicle Basis (mi)	Vehicle Emission Category	NMOG (g/mi)	Carbon Monoxide (g/mi)	Oxides of Nitrogen (g/mi)	Formaldehyde (mg/mi)	Particulates (g/mi)
MDVs 10,001-14,000 lbs. GVWR Vehicles in this category are tested at their adjusted loaded vehicle weight.	120,000	LEV	0.230	7.3	0.4	40	0.12
		ULEV	0.167	7.3	0.4	21	0.06
		SULEV	0.117	3.7	0.2	10	0.06
	150,000 (Optional)	LEV	0.230	7.3	0.4	40	0.12
		ULEV	0.167	7.3	0.4	21	0.06
		SULEV	0.117	3.7	0.2	10	0.06

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1.1.2.1 **LEV III Particulate Standards.**

1.1.2.1.1 **Particulate Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.** Beginning in the 2017 model year, a manufacturer, except a small volume manufacturer, shall certify a percentage of its passenger car, light-duty truck, and medium-duty vehicle fleet to the following particulate standards according to the following phase-in schedule. These standards represent the maximum particulate emissions allowed at full useful life. All vehicles certifying to these particulate standards must certify to the LEV III exhaust emission standards set forth in section E.1.1.2.

LEV III Particulate Emission Standard Values and Phase-in for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles		
Model Year	**% of vehicles certified to a 3 mg/mi standard**	**% of vehicles certified to a 1 mg/mi standard**
2017	10	0
2018	20	0
2019	40	0
2020	70	0
2021	100	0
2022	100	0
2023	100	0
2024	100	0
2025	75	25
2026	50	50
2027	25	75
2028 and subsequent	0	100

1.1.2.1.2 **Particulate Standards for Medium-Duty Vehicles Other than Medium-Duty Passenger Vehicles.**

1.1.2.1.2.1 Beginning in the 2017 model year, a manufacturer, except a small volume manufacturer, shall certify a percentage of its medium-duty vehicle fleet to the following particulate standards ~~according to the following phase-in schedule~~. These standards represent the maximum particulate emissions allowed at full useful life. All vehicles certifying to these particulate standards must certify to the LEV III exhaust emission standards set forth in section E.1.1.2. This section E.1.1.2.1.2.1 shall not apply to medium-duty passenger vehicles.

Date of Release: February 22, 2012; Proposed 15-day Changes
Date of Hearing: January 26-27, 2012

~~LEV III Particulate Emission Standard Values and Phase-in for Medium-Duty Vehicles Other than Medium-Duty Passenger Vehicles~~			
~~Vehicle Type~~	~~Model Year~~	~~% of vehicles certified to a 8 mg/mi standard~~	~~% of vehicles certified to a 10 mg/mi standard~~
~~MDVs 8501 - 10,000 lbs. GVWR, excluding MDPVs~~ ~~Vehicles in this category are tested at their adjusted loaded vehicle weight~~	~~2017~~	~~10~~	~~n/a~~
	~~2018~~	~~20~~	~~n/a~~
	~~2019~~	~~40~~	~~n/a~~
	~~2020~~	~~70~~	~~n/a~~
	~~2021 and subsequent~~	~~100~~	~~n/a~~
~~MDVs 10,001 - 14,000 lbs. GVWR~~ ~~Vehicles in this category are tested at their adjusted loaded vehicle weight~~	~~2017~~	~~n/a~~	~~10~~
	~~2018~~	~~n/a~~	~~20~~
	~~2019~~	~~n/a~~	~~40~~
	~~2020~~	~~n/a~~	~~70~~
	~~2021 and subsequent~~	~~n/a~~	~~100~~

LEV III Particulate Emission Standard Values for Medium-Duty Vehicles, Other than Medium-Duty Passenger Vehicles	
Vehicle Type[1]	Particulates (mg/mi)
MDVs 8501 - 10,000 lbs. GVWR, excluding MDPVs	8
MDVs 10,001 - 14,000 lbs. GVWR	10

[1] Vehicles in these categories are tested at their adjusted loaded vehicle weight.

1.1.2.1.2.2 A manufacturer of medium-duty vehicles, except a small volume manufacturer, shall certify at least the following percentage of its medium-duty vehicle fleet to the particulate standards in section E.1.1.2.1.2.1 according to the following phase-in schedule. This section E.1.1.2.1.2.2 shall not apply to medium-duty passenger vehicles.

LEV III Particulate Emission Standard Phase-in for Medium-Duty Vehicles, Other than Medium-Duty Passenger Vehicles	
Model Year	**Total % of MDVs certified to the 8 mg/mi PM Standard or to the 10 mg/mi PM Standard, as applicable**
2017	10
2018	20
2019	40
2020	70
2021 and subsequent	100

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1.1.2.1.4 **Alternative Phase-in Schedule for Particulate Standards.**

1.1.2.1.4.1 **Alternative Phase-in Schedules for the 3 mg/mi Particulate Standard for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.** A manufacturer may use an alternative phase-in schedule to comply with the 3 mg/mi particulate standard phase-in requirements as long as equivalent PM emission reductions are achieved by the 2021 model year from passenger cars, light-duty trucks, and medium-duty passenger vehicles. Model year emission reductions shall be calculated by multiplying the percent of PC+LDT+MDPV vehicles meeting the 3 mg/mi particulate standard in a given model year (based on a manufacturer's projected sales volume of vehicles in each category) by 5 for the 2017 model year, 4 for the 2018 model year, 3 for the 2019 model year, 2 for the 2020 model year, and 1 for the 2021 model year. The yearly results for PC+LDT+MDPV vehicles shall be summed together to determine a cumulative total for PC+LDT+MDPV vehicles. The cumulative total must be equal to or greater than 490 in the 2021 model year to be considered equivalent. A manufacturer may add vehicles introduced before the 2017 model year (e.g., the percent of vehicles introduced in 2016 would be multiplied by 5) to the cumulative total.

1.1.2.1.4.2 **Alternative Phase-in Schedules for the 1 mg/mi Particulate Standard for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.** A manufacturer may use an alternative phase-in schedule to comply with the 1 mg/mi particulate standard phase-in requirements as long as equivalent PM emission reductions are achieved by the 2028 model year from passenger cars, light-duty trucks, and medium-duty passenger vehicles. Model year emission reductions shall be calculated by multiplying the percent of PC+LDT+MDPV vehicles meeting the 1 mg/mi particulate standard in a given model year (based on a manufacturer's projected sales volume of vehicles in each category) by 4 for the 2025 model year, 3 for the 2026 model year, 2 for the 2027 model year, and 1 for the 2028 model year. The yearly results for PC+LDT+MDPV vehicles shall be summed together to determine a cumulative total for PC+LDT+MDPV vehicles. The cumulative total must be equal to or

greater than 500 in the 2028 model year to be considered equivalent. A manufacturer may add vehicles introduced before the 2025 model year (e.g., the percent of vehicles introduced in 2024 would be multiplied by 4) to the cumulative total.

1.1.2.1.4.3 **Alternative Phase-in Schedules for the Particulate Standards for Medium-Duty Vehicles Other than Medium-Duty Passenger Vehicles.** A manufacturer may use an alternative phase-in schedule to comply with the particulate standard phase-in requirements as long as equivalent PM emission reductions are achieved by the 2021 model year from medium-duty vehicles other than medium-duty passenger vehicles. Model year emission reductions shall be calculated by multiplying the total percent of MDVs certified to the 8 mg/mi PM standard or to the 10 mg/mi PM standard, as applicable, in a given model year (based on a manufacturer's projected sales volume of vehicles in each category) by 5 for the 2017 model year, 4 for the 2018 model year, 3 for the 2019 model year, 2 for the 2020 model year, and 1 for the 2021 model year. The yearly results for MDVs shall be summed together to determine a cumulative total for MDVs. The cumulative total must be equal to or greater than 490 in the 2021 model year to be considered equivalent. A manufacturer may add vehicles introduced before the 2017 model year (e.g., the percent of vehicles introduced in 2016 would be multiplied by 5) to the cumulative total.

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1.2 Supplemental Federal Test Procedure ("SFTP") Exhaust Emission Standards for Light- and Medium-Duty Vehicles.

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1.2.2 **150,000-mile SFTP Exhaust Emission Standards for Light- and Medium-Duty Vehicles.**

1.2.2.1 **SFTP NMOG+NOx and CO Exhaust Emission Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.** Manufacturers shall certify 2015 and subsequent model year LEVs, ULEVs, and SULEVs in the PC, LDT, and MDPV classes to either the *SFTP NMOG+NOx and CO Stand-Alone Exhaust Emission Standards* set forth in section E.1.2.2.1.1, or in accordance with the *SFTP NMOG+NOx and CO Composite Exhaust Emission Standards and Fleet-Average Requirements* set forth in section E.1.2.2.1.2. A manufacturer may also certify 2014 model LEVs, ULEVs, or SULEVs in the PC, LDT, or MDPV classes to LEV III SFTP standards, in which case, the manufacturer shall be subject to the LEV III SFTP emission standards and requirements, including the sales-weighted fleet-average NMOG+NOx composite emission standard applicable to 2015 model vehicles if choosing to comply with the *SFTP NMOG+NOx and CO Composite Exhaust Emission Standards and Fleet-Average Requirements* set forth in subsection E.1.2.2.1.2. The manufacturer shall notify the Executive Officer of its selected emission standard type in

the Application for Certification of the first test group certifying to SFTP NMOG+NOx and CO emission standards on a 150,000 mile durability basis. Once an emission standard type for NMOG+NOx and CO is selected for a fleet, and the Executive Officer is notified of such selection, the selection must be kept through the 2025 model year for the entire fleet, which includes LEV II vehicles if selecting to comply with section E.1.2.2.1.2. The manufacturer may not change its selection until the 2026 model year. Test groups not certifying to the 150,000-mile SFTP NMOG+NOx and CO emission standards pursuant to this section E.1.2.2 shall be subject to the 4,000-mile SFTP NMOG+NOx and CO emission standards set forth in section E.1.2.1.

1.2.2.1.1 **SFTP NMOG+NOx and CO Exhaust Stand-Alone Emission Standards.** The following standards are the maximum SFTP NMOG+NOx and CO exhaust emissions through full useful life from 2015 and subsequent model-year LEV III LEVs, ULEVs, and SULEVs when operating on ~~any~~ the same gaseous or liquid fuel they use for FTP certification. In the case of fuel-flexible vehicles, SFTP compliance shall be demonstrated using the LEV III certification gasoline specified in Part II, Section A.100.3.1.2.

SFTP NMOG+NOx and CO Stand-Alone Exhaust Emission Standards for 2015 and Subsequent Model LEV III Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles

Vehicle Type	*Durability Vehicle Basis (mi)*	*Vehicle Emission Category*[1]	*US06 Test (g/mi)*		*SC03 Test (g/mi)*	
			NM~~HC~~OG + NOx	*CO*	*NM~~HC~~OG + NOx*	*CO*
All PCs; LDTs 0- 8,500 lbs. GVWR; and MDPVs Vehicles in these categories are tested at their loaded vehicle weight (curb weight plus 300 pounds).	150,000	LEV	0.140	9.6	0.100	3.2
		ULEV	0.120	9.6	0.070	3.2
		SULEV (Option A)[2]	0.060	9.6	0.020	3.2
		SULEV	0.050	9.6	0.020	3.2

[1] *Vehicle Emission Category*. Manufacturers must certify all vehicles, which are certifying to a LEV III FTP emission category on a 150,000-mile durability basis, to the emission standards of the equivalent, or a more stringent, SFTP emission category set forth on this table. That is, all LEV III LEVs certified to 150,000-mile FTP emission standards shall comply with the SFTP LEV emission standards in this table, all LEV III ULEVs certified to 150,000-mile FTP emission standards shall comply with the SFTP ULEV emission standards in this table, and all LEV III SULEVs certified to 150,000-mile FTP emission standards shall comply with the SFTP SULEV emission standards in this table.

[2] *Optional SFTP SULEV Standards.* A manufacturer may certify light-duty truck test groups from 6,001 to 8,500 lbs. GVWR and MDPV test groups to the SULEV, option A, emission standards set forth in this table for the 2015 through 2020 model year, only if the vehicles in the test group are equipped with a particulate filter and the manufacturer extends the particulate filter emission warranty mileage to 200,000 miles. Passenger cars and light-duty trucks 0-6,000 lbs. GVWR are not eligible for this option.

1.2.2.1.2 **SFTP NMOG+NOx and CO Composite Exhaust Emission Standards.** For the 2015 and subsequent model years, a manufacturer must certify LEV II and LEV III LEVs, ULEVs, and SULEVs, such that the manufacturer's sales-weighted fleet-average NMOG+NOx composite emission value, does not exceed the applicable NMOG+NOx composite emission standard set forth in the following table. In addition, the CO composite emission value of any LEV III test group shall not exceed the CO composite emission standard set forth in the following table. SFTP compliance shall be demonstrated using the same gaseous or liquid fuel used for FTP certification. In the case of fuel-flexible vehicles, SFTP compliance shall be demonstrated using the LEV III certification gasoline specified in Part II, Section A.100.3.1.2.

For each test group subject to this subsection, manufacturers shall calculate a Composite Emission Value for NMOG+NOx and, for LEV III test groups, a separate Composite Emission Value for CO, using the following equation:

Composite Emission Value = 0.28 x US06 + 0.37 x SC03 + 0.35 x FTP [Eq. 1]

where "US06" = the test group's NMOG+NOx or CO emission value, as applicable, determined through the US06 test;
"SC03" = the test group's NMOG+NOx or CO emission value, as applicable, determined through the SC03 test; and
"FTP" = the test group's NMOG+NOx or CO emission value, as applicable, determined through the FTP test.

If no vehicles in a test group have air conditioning units, the FTP cycle emission value can be used in place of the SC03 value in Equation 1. To determine compliance with the SFTP NMOG+NOx composite emission standard applicable to the model year, manufacturers shall use a sales-weighted fleet average of the NMOG+NOx composite emission values of every applicable test group. The sales-weighted fleet average shall be calculated using a combination of carry-over and new certification SFTP composite emission values (converted to NMOG+NOx, as applicable). LEV II test groups will use their emission values in the fleet average calculation but will not be considered LEV III test groups. Compliance with the CO composite emission standard cannot be demonstrated through fleet averaging. The NMOG+NOx sales-weighted fleet-average composite emission value for the fleet and the CO composite emission value for each test group shall not exceed:

SFTP NMOG+NOx and CO Composite Emission Standards for 2015 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles (g/mi) [1]											
Model Year	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025+**
All PCs; LDTs 8,500 lbs. GVWR or less; and MDPVs[3]	***Sales-Weighted Fleet Average NMOG+NOx Composite Exhaust Emission Standards*** [2,4,5,6]										
	0.140	0.110	0.103	0.097	0.090	0.083	0.077	0.070	0.063	0.057	0.050
Vehicles in this category are tested at their loaded vehicle weight (curb weight plus 300 pounds).	***CO Composite Exhaust Emission Standard*** [7]										
	4.2										

[1] *Mileage for Compliance.* All test groups certifying to LEV III FTP emission standards on a 150,000-mile durability basis shall also certify to the SFTP on a 150,000-mile durability basis, as tested in accordance with these test procedures.

[2] *Determining NMOG+NOx Composite Emission Values of LEV II Test Groups.* For ~~carry-over~~ test groups certified to LEV II FTP emission standards, SFTP emission values shall be converted to NMOG+NOx and projected out to 120,000 miles or 150,000 miles (depending on LEV II FTP certification) using deterioration factors or aged components.~~,~~ NMHC emission values for the US06 and SC03 test cycles shall be converted to NMOG emission values by multiplying by a factor of 1.03. In lieu of deriving a deterioration factor specific to SFTP test cycles, carry-over test groups may use the applicable deterioration factor from the FTP cycle in order to determine the carry-over composite emission values for the purpose of the NMOG+NOx sales-weighted fleet-average calculation. If an SFTP full-useful life emission value is used to comply with SFTP 4k standards, that value may be used in the sales-weighted fleet-average without applying an additional deterioration factor.

[3] MDPVs are excluded from SFTP NMOG+NOx and CO emission standards and the sales-weighted fleet average until they are certified to LEV III FTP 150,000-mile NMOG+NOx and CO requirements.

[4] Test groups shall certify to bins in increments of 0.010 g/mi. Beginning with the 2018 model year, vehicles may not certify to bin values above a maximum of 0.180 g/mi.

[5] *Calculating the sales-weighted average for NMOG+NOx.* For each model year, the manufacturer shall calculate its sales-weighted fleet-average NMOG+NOx composite emission value as follows.

$$\frac{\left[\sum_{i=1}^{n}\left(number\ of\ \ vehicles\ in\ the\ test\ \ group\right)_i \times \left(composite\ value\ of\ \ bin\right)_i\right]}{\sum_{i=1}^{n}\left(number\ of\ \ vehicles\ in\ the\ test\ \ group\right)_i} \qquad \text{[Eq. 2]}$$

where "n" = a manufacturer's total number of PC, LDT, and, if applicable, MDPV certification bins, in a given model year including carry-over certification bins, certifying to SFTP composite emission standards in that model year;

"number of vehicles in the test group" = the number of vehicles produced and delivered for sale in California in the certification test group; and

"Composite Value of Bin" = the numerical value selected by the manufacturer for the certification bin that serves as the emission standard for the vehicles in the test group with respect to all testing for test groups certifying to SFTP on a 150,000-mile durability basis, and the SFTP carry-over composite emission value, as described in footnote 7 of this table, for carry-over LEV II test groups.

[6] *Calculation of Fleet Average Total NMOG+NOx Credits or Debits.* A manufacturer shall calculate the total NMOG+NOx credits or debits, as follows:

[(NMOG+NOx Composite Emission Standard) – (Manufacturer's Sales-Weighted Fleet-Average Composite Emission Value)]
x (Total Number of Vehicles Produced and Delivered for Sale in California in the 0-8,500 lbs GVWR plus MDPVs classes, if applicable) [Eq. 3]

A negative number constitutes total NMOG+NOx debits, and a positive number constitutes total NMOG+NOx credits accrued by the manufacturer for the given model year. Total NMOG+NOx credits earned in a given model year retain full value through the fifth model year after they are earned. At the beginning of the sixth model year, the total NMOG+NOx credits have no value. A manufacturer may trade credits with other manufacturers

A manufacturer shall equalize total NMOG+NOx debits within three model years after they have been incurred by earning NMOG+NOx credits in an amount equal to the total NMOG+NOx debits. If total NMOG+NOx debits are not equalized within the three model-year period, the manufacturer is subject to the Health and Safety Code section 43211 civil penalty applicable to a manufacturer which sells a new motor vehicle that does not meet the applicable emission standards adopted by the state board. The cause of action shall be deemed to accrue when the total NMOG+NOx debits are not equalized by the end of the specified time period. For the purposes of Health and Safety Code section 43211, the number of vehicles not meeting the state board's emission standards is determined by dividing the NMOG+NOx debits for the model year by the NMOG+NOx composite emission standard in effect during the model year in which the debits were incurred.

[7] *Calculating the CO composite emission value.* Composite emission values for CO shall be calculated in accordance with Equation 1 above. Unlike the NMOG+NOx composite emission standards, manufacturers would not be able to meet the proposed CO composite emission standard through fleet averaging: each individual test group must comply with the standard. Test groups certified to 4,000-mile SFTP emission standards are not subject to this CO emission standard.

1.2.2.2 **SFTP PM Exhaust Emission Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.** The following standards are the maximum PM exhaust emissions through the full useful life from 2017 and subsequent model-year LEV III LEVs, ULEVs, and SULEVs in the PC, LDT, and MDPV classes when operating on ~~any~~ the same gaseous or liquid fuel they use for FTP certification. In the case of flex-fueled vehicles, SFTP compliance shall be demonstrated using the LEV III certification gasoline specified in Part II, Section A.100.3.1.2.

SFTP PM Exhaust Emission Standards for 2017 and Subsequent Model LEV III Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles[1]

Vehicle Type	*Test Weight*	*Mileage for Compliance*	*Test Cycle*	*PM (mg/mi)*
All PCs; LDTs 0-6,000 lbs GVWR	Loaded vehicle weight	150,000	US06	10~~.0~~
LDTs 6,001-8,500 lbs GVWR; MDPVs	Loaded vehicle weight	150,000	US06	20~~.0~~

[1] All PCs, LDTs, and MDPVs certified to LEV III FTP PM emission standards in section E.1.1.2.1 on a 150,000-mile durability basis shall comply with the SFTP PM Exhaust Emission Standards in this table.

1.2.2.3 **SFTP NMOG+NOx and CO Exhaust Emission Standards for Medium-Duty Vehicles.** The following standards are the maximum NMOG+NOx and CO composite emission values for full useful life of 2016 and subsequent model-year medium-duty LEV III ULEVs and SULEVs from 8,501 through 14,000 pounds GVWR

when operating on ~~any~~ the same gaseous or liquid fuel they use for FTP certification. In the case of fuel-flexible vehicles, SFTP compliance shall be demonstrated using the LEV III certification gasoline specified in Part II, Section A.100.3.1.2. The following composite emission standards do not apply to MDPVs subject to the emission standards set forth in sections E.1.2.2.1 and E.1.2.2.2.

SFTP NMOG+NOx and CO Composite Exhaust Emission Standards for 2016 and Subsequent Model ULEVs and SULEVs in the Medium-Duty Vehicle Class

Vehicle Type	*Mileage for Compliance*	*HP/GVWR*[2]	*Test Cycle*[3,4,5]	*Vehicle Emission Category*[~~5~~ 6]	*Composite Emission Standard*[1] *(g/mi)*	
					NMOG + NOx	*Carbon Monoxide*
MDVs 8,501 - 10,000 lbs GVWR	150,000	≤ 0.024	US06 Bag 2, SC03, FTP	ULEV	0.550	22.0
				SULEV	0.350	12.0
		> 0.024	Full US06, SC03, FTP	ULEV	0.800	22.0
				SULEV	0.450	12.0
MDVs 10,001-14,000 lbs GVWR	150,000	n/a	Hot 1435 UC (Hot 1435 LA92), SC03, FTP	ULEV	0.550	6.0
				SULEV	0.350	4.0

[1] Manufacturers shall use Equation 1 in subsection E.1.2.2.1.2 to calculate SFTP Composite Emission Values for each test group subject to the emission standards in this table. For MDVs 10,001-14,000 lbs. GVWR, the emission results from the UC test shall be used in place of results from the US06 test.

[2] *Power to Weight Ratio.* If all vehicles in a test group have a power to weight ratio at or below a threshold of 0.024, they may opt to run the US06 Bag 2 in lieu of the full US06 cycle. The cutoff is determined by using a ratio of the engine's maximum rated horsepower, as established by the engine manufacturer in the vehicle's Application for Certification, to the vehicle's GVWR in pounds and does not include any horsepower contributed by electric motors in the case of hybrid electric or plug-in hybrid electric vehicles. Manufacturers may opt to test to the full cycle regardless of the calculated ratio; in such case, manufacturers shall meet the emission standards applicable to vehicles with power-to-weight ratios greater than 0.024.

[3] *Test Weight*. Medium-duty vehicles are tested at their adjusted loaded vehicle weight (average of curb weight and GVWR).

[4] *Road Speed Fan.* Manufacturers have the option to use a road speed modulated fan as specified in § 86.107–96(d)(1) instead of a fixed speed fan for MDV SFTP testing.

[5] If a manufacturer provides an engineering evaluation for a test group showing that SC03 emissions will be equivalent to or lower than FTP emissions, the FTP emission value may be used in place of the SC03 emission value when determining the composite emission value for that test group.

[~~5~~6] *Vehicle Emission Categories.* For MDVs 8,501-10,000 lbs. GVWR, for each model year, the percentage of MDVs certified to an SFTP emission category set forth in this section E.1.2.2.3 shall be equal to or greater than the total percentage certified to the FTP ULEV250, ULEV200, SULEV170, and SULEV150 emission categories; of these vehicles, the percentage of MDVs certified to an SFTP SULEV emission category shall be equal to or greater than the total percentage certified to both the FTP SULEV170 and SULEV150 emission categories. For MDVs 10,001-14,000 lbs. GVWR, for each model year, the percentage of MDVs certified to an SFTP emission category set forth this section E.1.2.2.3 shall be equal to or greater than the total percentage certified to the FTP ULEV400, ULEV270, SULEV230, and SULEV200 emission categories; of these vehicles, the percentage of MDVs certified to an SFTP SULEV emission category shall be equal to or greater than the total percentage certified to both the FTP SULEV230 and SULEV200 emission categories.

1.2.2.4 **SFTP PM Exhaust Emission Standards for Medium-Duty Vehicles.** The following standards represent the maximum PM composite emission values for the full useful life of 2017 and subsequent model-year LEV III LEVs, ULEVs, and SULEVs when operating on ~~any~~ the same gaseous or liquid fuel they use for FTP certification. In the case of fuel-flexible vehicles, SFTP compliance shall be demonstrated using the LEV

III certification gasoline specified in Part II, Section A.100.3.1.2. The following composite emission standards do not apply to MDPVs subject to the emission standards set forth in sections E.1.2.2.1 and E.1.2.2.2.

SFTP PM Exhaust Emission Standards for 2017 and Subsequent Model Medium-Duty Vehicles[1]

Vehicle Type	*Test Weight*	*Mileage for Compliance*	*Hp/GVWR*[2]	*Test Cycle*[3,4]	*PM (mg/mi)*
MDVs 8,501-10,000 lbs GVWR	Adjusted loaded vehicle weight	150,000	≤ 0.024	US06 Bag 2	7~~.0~~
			>0.024	US06	10~~.0~~
MDVs 10,001-14,000 lbs GVWR	Adjusted loaded vehicle weight	150,000	n/a	Hot 1435 UC (Hot 1435 LA92)	7~~.0~~

[1] Except for MDPVs subject to the emission standards set forth in section E.1.2.2.2, MDVs certified to 150,000-mile FTP PM emission standards in section E.1.1.2 shall comply with the SFTP PM Exhaust Emission Standards in this table.

[2] *Power to Weight Ratio.* If all vehicles in a test group have a power to weight ratio at or below a threshold of 0.024, they may opt to run the US06 Bag 2 in lieu of the full US06 cycle. The cutoff is determined by using a ratio of the engine's horsepower to the vehicle's GVWR in pounds and does not include any horsepower contributed by electric motors in the case of hybrid electric or plug-in hybrid electric vehicles. Manufacturers may opt to test to the full cycle regardless of the calculated ratio; in such case, manufacturers shall meet the emission standards applicable to vehicles with power-to-weight ratios greater than 0.024.

[3] *Road Speed Fan.* Manufacturers have the option to use a road speed modulated fan as specified in § 86.107–96(d)(1) instead of a fixed speed fan for MDV SFTP testing.

[4] Manufacturers shall use Equation 1 above to calculate SFTP Composite PM Emission Values for each test group subject to the emission standards in this table. For MDVs 8,501-10,000 lbs. GVWR certifying to the US06 Bag 2 PM emission standard, the emission results from the US06 Bag 2 test shall be used in place of results from the full US06 test. For MDVs 10,001-14,000 lbs. GVWR, the emission results from the UC test shall be used in place of results from the US06 test.

* * * *

1.6 Highway NMOG + NOx Standard.

The maximum emissions of NMOG+NOx measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR 600 Subpart B, which is incorporated herein by reference) must not be greater than the applicable LEV III NMOG+NOx standard set forth in section E.1.1.2. Both the sum of the NMOG+NOx emissions and the HWFET standard must be rounded in accordance with ASTM E29-67 to the nearest 0.001 g/mi before being compared.

* * * *

1.8 Requirement to Generate a Partial ZEV Allowance.

For the 2015 through 2017 model years, a manufacturer that certifies to the 150,000 mile LEV II SULEV standards, the LEV III SULEV30, or the LEV III SULEV20 standards ~~shall~~ may also generate a partial ZEV allocation according to the criteria set forth in section C.3 of the "California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes."

* * * *

2. Emission Standards Phase-In Requirements for Manufacturers.

2.1 Fleet Average NMOG + NOx Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.

2.1.1 The fleet average non-methane organic gas plus oxides of nitrogen exhaust mass emission values from the passenger cars, light-duty trucks, and medium-duty passenger vehicles produced and delivered for sale in California each model year by a manufacturer other than a small volume manufacturer shall not exceed:

FLEET AVERAGE NON-METHANE ORGANIC GAS PLUS OXIDES OF NITROGEN EXHAUST MASS EMISSION REQUIREMENTS FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY PASSENGER VEHICLES
(150,000 mile Durability Vehicle Basis)

Model Year	Fleet Average NMOG + NOx (g/mi)	
	All PCs; LDTs 0-3750 lbs. LVW	LDTs 3751 lbs. LVW - 8500 lbs. GVWR; All MDPVs
2014[1]	0.107	0.128
2015	0.100	0.119
2016	0.093	0.110
2017	0.086	0.101
2018	0.079	0.092
2019	0.072	0.083
2020	0.065	0.074
2021	0.058	0.065
2022	0.051	0.056
2023	0.044	0.047
2024	0.037	0.038
2025+	0.030	0.030

[1] For the 2014 model year, a manufacturer may comply with the fleet average NMOG+NOx values in this table in lieu of complying with the NMOG fleet average values in 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." A manufacturer must either comply with the NMOG+NOx fleet average requirements for both its PC/LDT1 fleet and its LDT2/MDPV fleet or comply with the NMOG fleet average requirements for both its PC/LDT1 fleet and its LDT2/MDPV fleet. A manufacturer must calculate its fleet average NMOG+NOx values using the applicable full useful standards.

2.1.1.1 *Pooling Provision.*

a. For each model year, a manufacturer must demonstrate compliance with the fleet average requirements in this section E.2.1.1 based on one of two options applicable throughout the model year, either:

Option 1: the total number of passenger cars, light-duty trucks, and medium-duty passenger vehicles that are certified to the California exhaust emission standards in section E.1.1, and are produced and delivered for sale in California; or

Option 2: the total number of passenger cars, light-duty trucks, and medium-duty passenger vehicles that are certified to the California exhaust emission standards in section E.1.1, and are produced and delivered for sale in California, the District of Columbia, and all states that have adopted California's exhaust emission standards in section E.1.1 for that model year pursuant to section 177 of the federal Clean Air Act (42 U.S.C. § 7507).

b. If a manufacturer selects Option 2, that manufacturer must demonstrate compliance with sections E.1.1.2.1, E.2.1, E.2.2, E.2.3, and E.2.4 based on Option 2.

~~b~~c. A manufacturer that selects compliance Option 2 must notify the Executive Officer of that selection in writing prior to the start of the applicable model year or must comply with Option 1. Once a manufacturer has selected compliance Option 2, that selection applies unless the manufacturer selects Option 1 and notifies the Executive Officer of that selection in writing before the start of the applicable model year.

~~c~~d. When a manufacturer is demonstrating compliance using Option 2 for a given model year, the term "in California" as used in sections E.2.1.2 and E.3.1 means California, the District of Columbia, and all states that have adopted California's exhaust emission standards in section E.1.1 for that model year pursuant to Section 177 of the federal Clean Air Act (42 U.S.C. § 7507).

~~d~~e. A manufacturer that selects compliance Option 2 must provide to the Executive Officer separate values for the number of vehicles in each test group produced and delivered for sale in the District of Columbia and for each individual state within the average.

2.1.1.2 **PZEVs Anti-Backsliding Requirement**. In the 2018 and subsequent model years, a manufacturer must produce and deliver for sale in California a minimum percentage of its passenger car and light-duty truck fleet that certifies to SULEV30 and SULEV20 standards. This minimum percentage must be equal to the average percentage of PZEVs produced and deliver for sale in California for that manufacturer ~~based~~ for the 2015 through 2017 model year. ~~For the 2018 model year, a~~ A manufacturer may

calculate this average percentage using the projected sales for these ~~2017~~ model years in lieu of actual sales.

2.1.2 **Calculation of Fleet Average NMOG + NOx Value**.

2.1.2.1 **Basic Calculation.**

(a) Each manufacturer's PC and LDT1 fleet average NMOG+NOx value for the total number of PCs and LDT1s produced and delivered for sale in California shall be calculated as follows:

(Σ [Number of vehicles in a test group excluding off-vehicle charge capable hybrid electric vehicles x applicable emission standard] +
Σ [Number of off-vehicle charge capable hybrid electric vehicles in a test group x HEV NMOG+NOx contribution factor]) ÷
Total Number of PCs plus LDT1s Produced and Delivered for sale in California, Including ZEVs and HEVs

(b) Each manufacturer's LDT2 and MDPV fleet average NMOG+NOx value for the total number of LDT2s and MDPVs produced and delivered for sale in California shall be calculated as follows:

(Σ [Number of vehicles in a test group excluding off-vehicle charge capable hybrid electric vehicles x applicable emission standard] +
Σ [Number of off-vehicle charge capable hybrid electric vehicles in a test group x HEV NMOG+NOx contribution factor]) ÷
Total Number of LDT2s plus MDPVs Produced and Delivered for sale in California, Including ZEVs and HEVs

(c) The applicable emission standards to be used in the above equations are as follows:

Model Year	**Emission Category**	**Emission Standard Value[1] (g/mi)**	
		All PCs; LDTs 0-3750 lbs. LVW	**LDTs 3751-5750 lbs. LVW; All MDPVs**
2015 and subsequent model year federally-certified vehicles ~~(AB 965 vehicles only)~~[2]	All	Sum of the full useful life NMOG and NOx Federal Emission Standards to which Vehicle is Certified	Sum of the full useful life NMOG and NOx Federal Emission Standards to which Vehicle is Certified
Model Year	**Emission Category**	**All PCs; LDTs 0-3750 lbs. LVW**	**LDTs 3751 lbs. LVW - 8500 lbs. GVWR; All MDPVs**
2015 through 2019 model year vehicles certified to the "LEV II" standards in E.1.1.1;	LEV II LEVs; LEV160s	0.160	0.160
	LEV II ULEVs; LEV125s	0.125	0.125

2015 and subsequent model year vehicles certified to the "LEV III" standards in E.1.1.2	ULEV70s	0.070	0.070
	ULEV50s	0.050	0.050
	LEV II SULEVs; SULEV30s	0.030	0.030
	SULEV20s	0.020	0.020
	LEV II LEVs; LEV395s	n/a	0.395
	LEV II ULEVs	n/a	0.343
	ULEV340s	n/a	0.340
	ULEV250s	n/a	0.250
	ULEV200s	n/a	0.200
	SULEV170s	n/a	0.170
	SULEV150s	n/a	0.150

[1] For LEV III vehicle test groups that meet the extended emission warranty requirements in section E.1.7, the applicable emission standard value shall be the emission standard value set forth in this table minus 5 mg/mi.

~~[2] "AB 965 vehicles" are those certified in accordance with the "Guidelines for Certification of 2003 and Subsequent Model Year Federally Certified Light-Duty Motor Vehicles for Sale in California," incorporated by reference in section 2062.~~

2.1.2.2 **NMOG+NOx Contribution Factor for Off-vehicle Charge Capable HEVs.** The HEV NMOG+NOx contribution factor for light-duty off-vehicle charge capable hybrid electric vehicles is calculated as follows:

LEV160 HEV Contribution Factor = 0.160 - [(Zero-emission VMT Allowance) x 0.035]
ULEV125 HEV Contribution Factor = 0.125 - [(Zero-emission VMT Allowance) x 0.055]
ULEV70 HEV Contribution Factor = 0.070 - [(Zero-emission VMT Allowance) x 0.020]
ULEV50 HEV Contribution Factor = 0.050 - [(Zero-emission VMT Allowance) x 0.020]
SULEV30 HEV Contribution Factor = 0.030 - [(Zero-emission VMT Allowance) x 0.010]
SULEV20 HEV Contribution Factor = 0.020 - [(Zero-emission VMT Allowance) x 0.020]

where the Zero-emission VMT Allowance for off-vehicle charge capable HEVs is determined in accordance with section C.3 of the "California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes" and the "California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes~~,~~," as applicable, except that for the purposes of this section E.2.1.2.2, the maximum allowable Zero-emission VMT Allowance that may be used in these equations is 1.0. This section E.2.1.2.2 shall only apply to off-vehicle charge capable HEVs certified to the LEV III standards set forth in section E.1.1.2.

~~2.1.2.3 **Federally-Certified Vehicles**. A vehicle certified to the standards for a federal exhaust emissions bin in accordance with section H.1 of these test procedures shall use the sum of the corresponding LEV II NMOG and NOx emission category value set forth in section E.2.1.2.1(c) of these test procedures for the fleet average calculation. If a vehicle is certified to 150,000 mile standards for a federal exhaust emission bin and the corresponding California NMOG+NOx emission category is a LEV III category, it may use the emission standard value for that LEV III category as set forth in the section E.2.1.2 table.~~

2.1.3 **Phase-in Requirements for Small Volume Manufacturers.**

(a) In the 2015 through 20~~19~~21 model years, a small volume manufacturer shall not exceed a fleet average NMOG+NOx value of 0.160 g/mi for PCs and LDTs from 0-3750 lbs. LVW or 0.160 g/mi for LDTs from 3751-5750 lbs. LVW calculated in accordance with section E.2.1.2. In 202~~0~~2 through 2024 model years, a small volume manufacturer shall not exceed a fleet average NMOG+NOx value of 0.125 g/mi for PCs and LDTs from 0-3750 lbs. LVW or 0.125 g/mi for LDTs from 3751 lbs. LVW - 8,500 lbs. GVW and MDPVs calculated in accordance with section E.2.1.2. In 2025 and subsequent model years, a small volume manufacturer shall not exceed a fleet average NMOG+NOx value of 0.070 g/mi for PCs and LDTs from 0-3750 lbs. LVW or 0.070 g/mi for LDTs from 3751 lbs. LVW - 8,500 lbs. GVW and MDPVs calculated in accordance with section E.2.1.2. For the 2015 through 2021 model years, a small volume manufacturer may certify its vehicles to the LEV II exhaust standards in section E.1.1.1 All vehicles certified by a small volume manufacturer for the 2022 and subsequent model years must meet the LEV III exhaust standards in section E.1.1.2.

* * * *

2.2 LEV III Phase-In Requirement for Light-Duty Vehicles and Medium-Duty Passenger Vehicles.

For the 2015 and 2016 model years, the LEV II SULEV emission standards set forth in section E.1.1.1 that are applicable to PCs, LDTs, and MDPVs shall only apply to those PCs, LDT1s, LDT2s, and MDPVs that certify to SULEV emission standards using "carryover" of emission test data from a previous model year in accordance with U.S. EPA OMS Advisory Circular A/C No. 17F, issued November 16, 1982, and last amended January 21, 1988, incorporated by reference in section 1961.2, title 13, CCR. Beginning in the 201~~5~~7 model year, the LEV II SULEV emission standards set forth in section E.1.1.1 that are applicable to PCs, LDTs, and MDPVs shall only apply to those PCs, LDT1s, LDT2s, and MDPVs that receive partial ZEV allowances in accordance with the "California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," ~~or the "California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes."~~ A manufacturer, other than a small volume manufacturer, must ~~shall~~ certify 100 percent of its PC, LDT, and MDPV fleet to the LEV III standards in section E.1.1.2 in 2020 and subsequent model years.

A small volume manufacturer must certify 100 percent of its PC, LDT, and MDPV fleet to the LEV III standards in section E.1.1.2 in 2022 and subsequent model years.

2.3 LEV III Phase-In Requirements for Medium-Duty Vehicles Other than Medium-Duty Passenger Vehicles.

2.3.1 (a) A manufacturer of MDVs, other than a small volume manufacturer, shall certify ~~at least the following percentage of~~ its MDV fleet according to the following phase-in schedule:

Model Year	**Vehicles Certified to Section E.1.1 (%)**				**Vehicles Certified to title 13 CCR Section 1956.8(c) or (h) (%)**
	LEV II LEV; LEV III LEV395 or LEV630	LEV II ULEV; LEV III ULEV340 or ULEV570	LEV III ULEV250 or ULEV400	LEV III SULEV170 or SULEV230	ULEV
2015	40	60	0	0	100
2016	20	60	20	0	100
2017	10	50	40	0	100
2018	0	40	50	10	100
2019	0	30	40	30	100
2020	0	20	30	50	100
2021	0	10	20	70	100
2022 +	0	0	10	90	100

* * * *

(c) **Alternate Phase-In Schedules for LEV III MDVs.** For the 2016 and subsequent model years, a manufacturer, that produces and delivers for sale in California four or fewer medium-duty test groups may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles.

1. A manufacturer that produces and delivers for sale in California four medium-duty test groups may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles.

Model Year	**Number of Test Groups Certified to Section E.1.1**				**Vehicles Certified to §1956.8(c) or (h) (%)**
	LEV II LEV; LEV III LEV395 or LEV630	LEV II ULEV; LEV III ULEV340 or ULEV570	LEV III ULEV250 or ULEV400	LEV III SULEV170 or SULEV230	ULEV
2016-2017	1	2	1	0	100
2018	0	2	2	0	100
2019	0	1	2	1	100
2020	0	1	1	2	100
2021	0	0	1	3	100
2022 +	0	0	0	4	100

2. A manufacturer that produces and delivers for sale in California three medium-duty test groups may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles.

Model Year	**Number of Test Groups Certified to Section E.1.1**				**Vehicles Certified to §1956.8(c) or (h) (%)**
	LEV II LEV; LEV III LEV395 or LEV630	LEV II ULEV; LEV III ULEV340 or ULEV570	LEV III ULEV250 or ULEV400	LEV III SULEV170 or SULEV230	ULEV
2016	1	2	0	0	100
2017	0	2	1	0	100
2018	0	1	2	0	100
2019-2020	0	1	1	1	100
2021	0	0	1	2	100
2022 +	0	0	0	3	100

3. A manufacturer that produces and delivers for sale in California two medium-duty test groups may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles.

Model Year	**Number of Test Groups Certified to Section E.1.1**				**Vehicles Certified to §1956.8(c) or (h) (%)**
	LEV II LEV; LEV III LEV395 or LEV630	LEV II ULEV; LEV III ULEV340 or ULEV570	LEV III ULEV250 or ULEV400	LEV III SULEV170 or SULEV230	ULEV
2016	1	1	0	0	100
2017-2019	0	1	1	0	100
2020-2021	0	0	1	1	100
2022 +	0	0	0	2	100

4. A manufacturer that produces and delivers for sale in California one medium-duty test groups may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles.

Model Year	**Number of Test Groups Certified to Section E.1.1**				**Vehicles Certified to §1956.8(c) or (h) (%)**
	LEV II LEV; LEV III LEV395 or LEV630	LEV II ULEV; LEV III ULEV340 or ULEV570	LEV III ULEV250 or ULEV400	LEV III SULEV170 or SULEV230	ULEV
2016-2018	0	1	0	0	100
2019-2021	0	0	1	0	100
2022 +	0	0	0	1	100

* * * *

2.5 Greenhouse Gas Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.

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2.5.5 **Calculation of Fleet Average Carbon Dioxide Value**.

* * * *

2.5.5.4 For each model year, a manufacturer must demonstrate compliance with the fleet average requirements in section E.2.5 based on one of two options applicable throughout the model year, either:

Option 1: the total number of passenger cars, light-duty trucks, and medium-duty passenger vehicles that are certified to the California exhaust emission standards in section E.2.5, and are produced and delivered for sale in California; or

Option 2: the total number of passenger cars, light-duty trucks, and medium-duty passenger vehicles that are certified to the California exhaust emission standards in section E.2.5, and are produced and delivered for sale in California, the District of Columbia, and all states that have adopted California's greenhouse gas emission standards for that model year pursuant to Section 177 of the federal Clean Air Act (42 U.S.C. § 7507).

1. A manufacturer that selects compliance Option 2 must notify the Executive Officer of that selection, in writing, prior to the start of the applicable model year or must comply with Option 1. Once a manufacturer has selected compliance Option 2, that selection applies unless the manufacturer selects Option 1 and notifies the Executive Officer of that selection in writing before the start of the applicable model year.

2. When a manufacturer is demonstrating compliance using Option 2 for a given model year, the term "in California" as used in sections E.2.5 and E.3.2 means California, the District of Columbia, and all states that have adopted California's greenhouse gas emission standards for that model year pursuant to Section 177 of the federal Clean Air Act (42 U.S.C. § 7507).

3. A manufacturer that selects compliance Option 2 must provide to the Executive Officer separate values for the number of vehicles in each model type and footprint value produced and delivered for sale in the District of Columbia and for each individual state within the average and the City CO_2 Value and Highway CO_2 exhaust emission values that apply to each model type and footprint value.

* * * *

2.5.6 **Credits for Reduction of Air Conditioning Direct Emissions**.

Manufacturers may generate A/C Direct Emissions Credits by implementing specific air conditioning system technologies designed to reduce air conditioning direct emissions over the useful life of their vehicles. A manufacturer may only use an A/C Direct Emissions Credit for vehicles within a model type upon approval of the A/C Direct Emissions Credit for that model type by the Executive Officer. The conditions and requirements for obtaining approval of an A/C Direct Emissions Credit are described below.

* * * *

2.5.6.2 To obtain approval of the A/C Direct Emissions Credit, the manufacturer must demonstrate through an engineering evaluation that the A/C system under consideration reduces A/C direct emissions. The demonstration must include all of the following elements:

- the amount of A/C Direct Emissions Credit requested, in grams of CO_2-equivalent per mile (gCO_2e/mi);
- the calculations identified in section 1961.3(a)(6)(C) justifying that credit amount,
- schematic of the A/C system;
- specifications of the system components with sufficient detail to allow reproduction of the calculation; and
- ~~a justification that the number of fittings and joints has been minimized and components have been optimized to minimize leakage~~ an explanation describing what efforts have been made to minimize the number of fittings and joints and to optimize the components in order to minimize leakage.

Calculated values must be carried to at least three significant figures throughout the calculations, and the final credit value must be rounded to one tenth of a gram of CO_2-equivalent per mile (gCO_2e/mi).

* * * *

3. Calculation of Credits/Debits

3.1 Calculation of NMOG+NOx Credits/Debits

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3.1.2 **Calculation of Vehicle-Equivalent NMOG+NOx Credits for Medium-Duty Vehicles Other than MDPVs.**

3.1.2.1 In ~~2015~~ 2016 and subsequent model years, a manufacturer that produces and delivers for sale in California MDVs, other than MDPVs, in excess of the equivalent requirements for LEV III vehicles certified to the exhaust emission standards set forth in section E.1 of these test procedures shall receive "Vehicle-Equivalent Credits" (or "VECs") calculated in accordance with the following equation, where the term "produced" means produced and delivered for sale in California:

(1.00) x {[(No. of LEV395s and LEV630s Produced excluding HEVs) +
(No. of LEV395 HEVs x HEV VEC factor for LEV395s) +
(No. of LEV630 HEVs x HEV VEC factor for LEV630s)] –
(No. of LEV395s and LEV630s Required to be Produced)} +

~~{{~~(1.~~2~~14) x {[(No. of ULEV340s and ULEV570s Produced excluding HEVs) +
(No. of ULEV340 HEVs x HEV VEC factor for ULEV340s) +
(No. of ULEV570 HEVs x HEV VEC factor for ULEV570s)] –
(~~Equivalent~~ No. of ULEV340s and ULEV570s Required to be Produced)} +

~~{{~~(1.~~4~~37) x {[(No. of ULEV250s and ULEV400s Produced excluding HEVs) +
(No. of ULEV250 HEVs x HEV VEC factor for ULEV250s) +
(No. of ULEV400 HEVs x HEV VEC factor for ULEV400s)] -
~~[(1.4) x~~ (~~Equivalent~~ No. of ULEV250s and ULEV270s Required to be
Produced)~~]~~} +

~~{{~~(1.~~5~~49) x {[(No. of ULEV200s and ULEV270s Produced excluding HEVs) +
(No. of ULEV200 HEVs x HEV VEC factor for ULEV200s) +
(No. of ULEV270 HEVs x HEV VEC factor for ULEV270s)] -
~~[(1.5) x~~ (~~Equivalent~~ No. of ULEV200s and ULEV270s Required to be
Produced)~~]~~} +

~~{{~~(1.~~6~~57) x {[(No. of SULEV170s and SULEV230s Produced excluding HEVs) +
(No. of SULEV170 HEVs x HEV VEC factor for SULEV170s) +
(No. of SULEV230 HEVs x HEV VEC factor for SULEV230s)] -
~~[(1.6) x [~~(~~Equivalent~~ No. of SULEV170s and SULEV230s Required to be
Produced)~~]~~} +

~~{{~~(1.~~7~~62) x {[(No. of SULEV150s and SULEV200s Produced excluding HEVs) +
(No. of SULEV150 HEVs x HEV VEC factor for SULEV150s) +
(No. of SULEV200 HEVs x HEV VEC factor for SULEV200s)] -
~~[(1.7) x [~~(~~Equivalent~~ No. of SULEV150s and SULEV200s Required to be
Produced)~~]~~} +

[(2.00) x (No. of ZEVs Certified and Produced as MDVs)].

3.1.2.2 The MDV HEV VEC factor is calculated as follows:

For LEV395s: $1+\left[\frac{(LEV395\ standard-ULEV340\ standard)\times Zero-emission\ VMT\ Allowance}{LEV395\ standard}\right]$;

For ULEV340s: $1+\left[\frac{(ULEV340\ standard-ULEV250\ standard)\times Zero-emission\ VMT\ Allowance}{ULEV340\ standard}\right]$;

For ULEV250s: $1+\left[\frac{(ULEV250\ standard-ULEV200\ standard)\times Zero-emission\ VMT\ Allowance}{ULEV250\ standard}\right]$;

For ULEV200s: $1+\left[\frac{(ULEV200\ standard-SULEV170\ standard)\times Zero-emission\ VMT\ Allowance}{ULEV3200\ standard}\right]$;

For SULEV170s: $1+\left[\frac{(SULEV170\ standard-SULEV150\ standard)\times Zero-emission\ VMT\ Allowance}{SULEV170\ standard}\right]$;

For SULEV150s: $1+\left[\frac{(SULEV150\ standard-ZEV\ standard)\times Zero-emission\ VMT\ Allowance}{SULEV150\ standard}\right]$;

For LEV630s: $1+\left[\frac{(LEV630\ standard-ULEV570\ standard)\times Zero-emission\ VMT\ Allowance}{LEV630\ standard}\right]$;

For ULEV570s: $1+\left[\frac{(ULEV570\ standard-ULEV400\ standard)\times Zero-emission\ VMT\ Allowance}{ULEV570\ standard}\right]$;

For ULEV400s: $1+\left[\frac{(ULEV400\ standard-ULEV270\ standard)\times Zero-emission\ VMT\ Allowance}{ULEV400\ standard}\right]$;

For ULEV270s: $1+\left[\frac{(ULEV270\ standard-SULEV230\ standard)\times Zero-emission\ VMT\ Allowance}{ULEV270\ standard}\right]$;

For SULEV230s: $1+\left[\frac{(SULEV230\ standard-SULEV200\ standard)\times Zero-emission\ VMT\ Allowance}{SULEV230\ standard}\right]$

For SULEV200s: $1+\left[\frac{(SULEV200\ standard-ZEV\ standard)\times Zero-emission\ VMT\ Allowance}{SULEV200\ standard}\right]$

where "Zero-emission VMT Allowance" for an HEV is determined in accordance with section C of the "California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes" or the "California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," as applicable, except that for the purposes of this section E.3.1.2.2, the maximum allowable Zero-emission VMT Allowance that may be used in these equations is 1.0..

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4. LEV III Criteria Pollutant Interim In-Use Compliance Standards.

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4.3 **SFTP Interim In-Use Compliance Emission Standards.**

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4.3.2 Test groups certified prior to the 202~~0~~1 model year will be allowed an in-use compliance standard for PM for the first five model years that they are certified to the SFTP PM standard.

* * * *

5. LEV III Greenhouse Gas In-Use Compliance Standards.

The in-use exhaust CO_2 emission standard shall be the combined city/highway exhaust emission value calculated according to the provisions of section E.2.5.5.1 for the vehicle model type and footprint value multiplied by 1.1 and rounded to the nearest whole gram per mile. For vehicles that are capable of operating on multiple fuels, a separate value shall be determined for each fuel that the vehicle is capable of operating on. These standards apply to in-use testing performed by the manufacturer pursuant to the regulations at §86.1845-04 and §86.1846-01 and to in-use testing performed by the Air Resources Board.

~~5~~**6. Severability.** Each provision of these standards and test procedures is severable, and in the event that any provision of these standards and test procedures is held to be invalid, the remainder of the standards and test procedures remains in full force and effect.

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G. Procedures for Demonstration of Compliance with Emission Standards

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3. §86.1829 Durability data and emission data testing requirements; waivers.

* * * *

3.5 LEV III PM Testing Requirements.

For the 2017 and subsequent model years, a manufacturer must submit test data for test groups certifying to the LEV III PM standards in section E.1.1.2.1 according to the following table. Once a test group has been used to meet the requirements of this section G.3.5 for a model year, that same test group shall not be selected in the succeeding two model years unless the manufacturer produces fewer than four test groups that are certified to LEV III PM standards. For all test groups that are certified to LEV III PM standards for which test data is not submitted, the manufacturer must, in accordance with good engineering practices, attest that such test groups will comply with the applicable LEV III PM standards.

Number of Test Groups Certified to LEV III PM Standards	Number of Test Groups That Must Be Tested to Demonstrate Compliance with LEV III PM Standards
1 or 2	All test groups certifying to LEV III PM standards
3	2
4 or more	25% of test groups certifying to LEV III PM standards

* * * *

H. Certification, Information and Reporting Requirements.

1. §86.1841 Compliance with emission standards for the purpose of certification

* * * *

1.4 **Certification of a Federal Vehicle in California.** Whenever a manufacturer federally-certifies a 2015 or subsequent model-year passenger car, light-duty truck or medium-duty vehicle model to the standards for a particular emissions bin that are more stringent than the standards for an applicable California vehicle emissions category, the equivalent California model may only be certified to (i) the California standards for a vehicle emissions category that are at least as stringent as the standards for the corresponding federal emissions bin, or (ii) the exhaust emission standards to which the federal model is certified. However, where the federal exhaust emission standards for the particular emissions bin and the California standards for a vehicle emissions category are equally stringent, the California model may only be certified to either the California standards for that vehicle emissions category or more stringent California standards. The federal emission bins are those contained Tables S04-1 and S04-2 of 40 CFR section 86.1811-04(c) as adopted February 10, 2000. A California vehicle model is to be treated as equivalent to a federal vehicle model if all of the following characteristics are identical:

(a) Vehicle make and model;
(b) Cylinder block configuration (e.g., L-6, V-8);
(c) Displacement;
(d) Combustion cycle;
(e) Transmission class;
(f) Aspiration method (e.g., naturally aspirated, turbocharged); and
(g) Fuel (e.g., gasoline, natural gas, methanol).

The comparative stringency of the standards for the federal exhaust emissions bin and for the California vehicle emissions category shall be based on a comparison of the sum of the 150,000 mile federal standards to the LEV III NMOG+NOx standards or the sum of the 120,000 mile federal standards to the sum of the 120,000 mile LEV II NMOG and NOx standards, as applicable.

* * * *

1.4.4 For purposes of meeting the California NMOG+NOx fleet average phase-in requirements or for determining vehicle equivalent credits, the applicable California NMOG+NOx value for passenger cars and light-duty trucks or vehicle equivalent credits for medium-duty vehicles shall be ~~determined as follows:~~

~~(a) T~~the sum of the federal full useful life (150,000 miles or 120,000 miles, as applicable) NMOG and NOx values ~~shall be compared with the next less stringent California full useful life NMOG+NOx value to determine which emission category (e.g., LEV630, LEV395, LEV160, ULEV570, ULEV400, ULEV340, ULEV270, ULEV250, ULEV200, ULEV125, ULEV70, ULEV50, SULEV230, SULEV200, SULEV170, SULEV150, SULEV30, or SULEV20) is to be used for the fleet average value or vehicle equivalent credit calculation~~.

~~(b) For passenger cars and light-duty trucks, once the equivalent California emission category is determined (e.g., whether the vehicle is considered a LEV630, LEV395, LEV160, ULEV570, ULEV400, ULEV340, ULEV270, ULEV250, ULEV200, ULEV125, ULEV70, ULEV50, SULEV230, SULEV200, SULEV170, SULEV150, SULEV30, or SULEV20), the applicable NMOG+NOx value to be used in the fleet average calculation is set forth in the table in section E.2.1.2 of these test procedures for passenger cars and light-duty trucks. For example, if the full useful life (150,000 miles) NMOG plus NOx standard to which the federal vehicle is certified is 0.110 grams per mile, that vehicle would be considered a ULEV125 for fleet average purposes because the combined ULEV125 full useful life NMOG+NOx value is 0.125 and is the next less stringent emission category. The applicable emission standard to be used in the fleet average calculation would therefore be 0.125 grams per mile.~~

* * * *

1.4.6 The tune up label shall meet the federal requirements applicable to such a vehicle with an additional sentence which reads: "This vehicle conforms to federal regulations and is certified for sale in California." The value used in the ~~smog index label~~ California Environmental Performance Label shall be the California emission category to which the vehicle was deemed certified for fleet average NMOG purposes.

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3. §86.1843 General information requirements

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3.2 **Alternative Fuel Information.**

For passenger cars, light-duty trucks, and medium-duty vehicles not certified exclusively on gasoline or diesel, except for vehicles that use hydrogen fuel, the manufacturer shall submit projected California sales and fuel economy data nineteen months prior to January 1 of the model year for which the vehicles are certified. For vehicles that use hydrogen fuel, the manufacturer shall submit projected California sales and leases, fuel economy data, vehicle fuel pressure rating, name of air basin(s) where vehicles will be delivered for sale or lease, and

number of vehicles projected to be delivered to each air basin, thirty-three months prior to January 1 of the model year for which the vehicles are certified.

* * * *

4. §86.1844 Information Requirements: Application for Certification and Submittal of Information Upon Request.

4.1 §86.1844-01. September 15, 2011. Amend as follows:

* * * *

4.1.3 Add the following requirements to §86.1844-01(e):

(a) The information required in sections 2037, 2038 and 2039, title 13, CCR.

(b) The NMOG/NMHC and/or formaldehyde to NMHC ratios established according to section I.1.~~4~~2 of these test procedures.

* * * *

PART II: CALIFORNIA EXHAUST AND PARTICULATE EMISSION TEST PROCEDURES FOR PASSENGER CARS, LIGHT-DUTY TRUCKS AND MEDIUM-DUTY VEHICLES

* * * *

A. 40 CFR Part 86, Subpart B - Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles and New Light-Duty Trucks and New Otto-Cycle Complete Heavy-Duty Vehicles; Test Procedures.

* * * *

100.3 Certification Fuel Specifications.

* * * *

100.3.1 California Certification Gasoline Specification.

* * * *

100.3.1.2 Certification Gasoline Fuel Specifications for LEV III Light-Duty Vehicles and Medium-Duty Vehicles.

Add the following subparagraph which reads: For all light-duty vehicles and medium-duty vehicles certifying to the LEV III standards in section E.1.1.2, gasoline having the specifications listed below shall be used in exhaust emission testing, and the Executive Officer shall conduct exhaust emission testing with gasoline having the specifications listed below. Use

of this fuel for evaporative emission testing shall be required as specified in the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles."

California Certification Gasoline Specifications for LEV III Light-Duty Vehicles and Medium-Duty Vehicles		
Fuel Property[(a)]	**Limit**	**Test Method** [(b)]
Octane (R+M)/2 [(~~i~~c)]	87-88.4; 91 (min)	D 2699-88, D 2700-88
Sensitivity	7.5 (min)	D 2699-88, D 2700-88
Lead	0-0.01g/gal (max); no lead added	§2253.4(c), title 13 CCR
Distillation Range:		§2263, title 13 CCR[(~~c~~d)]
10% point	130-150 ^{o}F	
50% point [(~~d~~)]	205-215 ^{o}F	
90% point [(~~e~~)]	310-320 ^{o}F	
EP, maximum	390 ^{o}F	
Residue	2.0 vol. % (max)	
Sulfur	8-11 ppm by wt.	§2263, title 13 CCR
Phosphorous	0.005 g/gal (max)	§2253.4(c), title 13 CCR
RVP	6.9-7.2 psi	§2263, title 13 CCR
Olefins	4.0-6.0 vol. %	§2263, title 13 CCR
Total Aromatic Hydrocarbons	19.5-22.5 vol. %	§2263, title 13 CCR
Benzene	0.6-0.8 vol. %[(~~f~~)]	§2263, title 13 CCR
Multi-substituted Alkyl Aromatic Hydrocarbons	13-15 vol. %[(~~ge~~)]	
MTBE	0.05 vol. %	§2263, title 13 CCR
Ethanol	9.8-10.2 vol. %	
Total Oxygen	3.3-3.7 wt. %	§2263, title 13 CCR
Additives	Sufficient to meet requirements of §2257, title 13 CCR	
Copper Corrosion	No. 1	D 130-88
Gum, washed	3.0 mg/100 mL (max)	D 381-86
Oxidation Stability	1000 minutes (min)	D 525-88
Specific Gravity	Report [(~~h~~i)]	

Heat of Combustion	Report [~~h~~f]	
Carbon	Report wt. % [~~h~~f]	
Hydrogen	Report wt. % [~~h~~f]	

[a] The gasoline must be blended from typical refinery feedstocks.

[b] ASTM specification unless otherwise noted. 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 with the specified method.

[~~i~~c] For vehicles/engines that require the use of premium gasoline as part of their warranty, the Octane ((R+M)/2) ~~shall~~ may be a 91 minimum. All other certification gasoline specifications, as shown in this table, must be met. For all other vehicles/engines, the Octane ((R+M)/2) shall be 87-88.4.

[~~e~~d] Although §2263, title 13, CCR refers to the temperatures of the 50 and 90 percent points, this procedure can be extended to the 10 percent and end point temperatures, and to the determination of the residue content.

~~[d] The range for interlaboratory testing is 195-215° F.~~

~~[e] The range for interlaboratory testing is 285-305° F.~~

~~[f] The range for interlaboratory testing is 0.7-1.1 percent by volume.~~

[~~g~~e] "Detailed Hydrocarbon Analysis of Petroleum Hydrocarbon Distillates, Reformates, and Gasoline by Single Column High Efficiency (Capillary) Column Gas Chromatography," by Neil Johansen, 1992, Boulder, CO.

[~~h~~f] The fuel producer should report this fuel property to the fuel purchaser. Any generally accepted test method may be used and shall be identified in the report.

* * * *

100.3.4 Mixtures of Petroleum and Alcohol Fuels for Flexible Fuel Vehicles.
Amend §86.113-94(d) as follows:

* * * *

3. Add the following subparagraphs. **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, the fuel for evaporative emission testing shall be the gasoline set forth in Part II, Section A.100.3.1.2 of these test procedures. ~~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 Part II, Section A.100.3.1.1 of 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.

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.

* * * *

100.5.5 California exhaust emission test procedures for US06 emissions.

100.5.5.1 Amend §86.159-08 as follows: Add the following sentence: The exhaust PM emissions shall be measured using equivalent measurement techniques as those used to measure exhaust PM emissions on the FTP cycle except that provisions accounting for the cold start portion of the FTP cycle (including factors used to weight emission values from the different phases) shall be ignored.

100.5.5.~~1~~2 Delete subparagraph (b)(9) of §86.159-08 and replace with: During dynamometer operation, a fixed speed cooling fan or a road speed modulated fan as specified in §86.107–96(d)(1) may be used. The fan shall be positioned so as to direct cooling air to the vehicle in an appropriate manner. The engine compartment cover shall remain open if a fixed speed cooling fan is used and closed if a road speed modulated fan is used. In the case of vehicles with front engine compartments, the fan shall be squarely positioned within 24 inches (61 centimeters) of the vehicle. In the case of vehicles with rear engine compartments (or if special designs make the above impractical), the cooling fan shall be placed in a position to provide sufficient air to maintain vehicle cooling. The Executive Officer may approve modified cooling configurations or additional cooling if necessary to satisfactorily perform the test. In approving requests for additional or modified cooling, the Executive Officer will consider such items as actual road cooling data and whether such additional cooling is needed to provide a representative test.

100.5.5.~~1~~3 Hot 1435 **LA92 (Hot 1435 Unified Cycle) Test Procedure.** Amend §86.159-08 as follows: Add the following sentences: The exhaust PM emissions shall be measured using equivalent measurement techniques as those used to measure exhaust PM emissions on the FTP cycle except that provisions accounting for the cold start portion of the FTP cycle (including factors used to weight emission values from the different phases) shall be ignored. ~~to §86.159-08:~~ The NMOG, CO, NOx, and formaldehyde emissions shall be measured according to the US06 Test Procedure as set forth in Subpart B, 40 CFR 86.159-08 with the following modifications:

1. Replace all references to "US06" with "Hot 1435 Unified Cycle." Where §86.159-08 references another section of 40 CFR part 86, replace all mention of "US06" with "Hot 1435 Unified Cycle" in referenced sections.

2. Amend 40 CFR 86.159-08 as follows:

2.1 Delete Paragraph (a); replace with: **Overview.**

The dynamometer operation consists of a single test starting from second 0 and ending at second 1435 in the driving schedule shown in Part II, Section ~~F~~G. This cycle will herein be referred to as "Hot 1435 Unified Cycle." The vehicle is preconditioned in accordance with the instructions in this section to bring it up to a warmed-up, stabilized condition. This preconditioning is followed by a 1 to 2 minute idle period that proceeds directly into the Hot 1435 Unified Cycle driving schedule during which continuous proportional samples of gaseous emissions are collected for analysis.

2.2 Paragraph (b)

2.2.1 Subparagraphs (1) through (8) [No change.]

2.2.2 Delete subparagraph (9); replace with: **Dynamometer activities.**

During dynamometer operation, a fixed speed cooling fan or a road speed modulated fan as specified in §86.107–96(d)(1) may be used. The fan shall be positioned so as to direct cooling air to the vehicle in an appropriate manner. ~~with t~~The engine compartment cover shall remain open if a fixed speed cooling fan is used and closed if a road speed modulated fan is used. In the case of vehicles with front engine compartments, the fan shall be squarely positioned within 24 inches (61 centimeters) of the vehicle. In the case of vehicles with rear engine compartments (or if special designs make the above impractical), the cooling fan shall be placed in a position to provide sufficient air to maintain vehicle cooling. The Executive Officer may approve modified cooling configurations or additional cooling if necessary to satisfactorily perform the test. In approving requests for additional or modified cooling, the Executive Officer will consider such items as actual road cooling data and whether such additional cooling is needed to provide a representative test.

2.3 Paragraph (c) through (f) [No change.]

100.5.5.~~2~~4 **US06 Bag 2 Test Procedure.**

Amend §86.159-08 as follows: Add the following sentences: The exhaust PM emissions shall be measured using equivalent measurement techniques as those used to measure exhaust PM emissions on the FTP cycle except that provisions accounting for the cold start portion of the FTP cycle (including factors used to weight emission values from the different phases) shall be ignored. The NMOG, CO, NOx, and formaldehyde emissions shall be measured according to the US06 Test Procedure as set forth in Subpart B, 40 CFR §86.159-08 with the following modifications:

* * * *

2. Amend 40 CFR 86.159-08 as follows:

* * * *

2.2 Paragraph (b)

2.2.1 Subparagraphs (1) through (8) [No change.]

2.2.2 Delete subparagraph (9); replace with: **Dynamometer activities.**

During dynamometer operation, a fixed speed cooling fan or a road speed modulated fan as specified in § 86.107–96(d)(1) may be used. The fan shall be positioned so as to direct cooling air to the vehicle in an appropriate manner. ~~with t~~The engine compartment cover shall remain open if a fixed speed cooling fan is used and closed if a road speed modulated fan is used. In the case of vehicles with front engine compartments, the fan shall be squarely positioned within 24 inches (61 centimeters) of the vehicle. In the case of vehicles with rear engine compartments (or if special designs make the above impractical), the cooling fan shall be placed in a position to provide sufficient air to maintain

vehicle cooling. The Executive Officer may approve modified cooling configurations or additional cooling if necessary to satisfactorily perform the test. In approving requests for additional or modified cooling, the Executive Officer will consider such items as actual road cooling data and whether such additional cooling is needed to provide a representative test.

* * * *

G. Hot 1435 Unified Cycle Driving Schedule.

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Hot 1435 Unified Test Cycle
(Speed vs Time Sequence)

Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)
1	0	74	12.3	147	20	220	0	293	0	366	45.3	439	60.3	512	28
2	0	75	8.1	148	23	221	0	294	0	367	46.5	440	60.3	513	26.5
3	0	76	6.1	149	25.7	222	0	295	0	368	48	441	60.3	514	24.2
4	0	77	9.6	150	28	223	0	296	0	369	48.8	442	59.5	515	22.7
5	0	78	12.7	151	30.7	224	0	297	0	370	49.5	443	58.8	516	20.4
6	0	79	15.7	152	32.6	225	0	298	0	371	49.9	444	59.1	517	17.7
7	0	80	18	153	34.2	226	0	299	0	372	49.9	445	58.8	518	15.7
8	0	81	20.4	154	35.3	227	0	300	0	373	49.9	446	58.8	519	13.1
9	0	82	21.9	155	36.9	228	0	301	0	374	49.5	447	58.8	520	10.8
10	0	83	23.4	156	36.9	229	0	302	0	375	49.5	448	58.4	521	8.4
11	0	84	23.8	157	37.2	230	0	303	0	376	48.8	449	58	522	7.3
12	0	85	24.6	158	37.6	231	0	304	0	377	48.8	450	58	523	5
13	0	86	25	159	37.6	232	0	305	0	378	48.8	451	58	524	3.8
14	0	87	26.1	160	37.6	233	0	306	0	379	48.4	452	58.4	525	3.5
15	0	88	26.1	161	37.2	234	0	307	0	380	48.8	453	59.1	526	1.9
16	0	89	26.9	162	37.2	235	0	308	0	381	49.5	454	59.5	527	0.8
17	0	90	26.9	163	36.9	236	0	309	0	382	50.3	455	59.9	528	0
18	0	91	26.9	164	36.5	237	0	310	0	383	50.7	456	59.9	529	0
19	0	92	26.5	165	36.5	238	1.5	311	0	384	51.8	457	60.3	530	0
20	0	93	25.7	166	34.9	239	5	312	0	385	52.6	458	61.1	531	0.8
21	1.2	94	21.9	167	33.4	240	8.8	313	0.4	386	53.4	459	61.1	532	1.9
22	4.2	95	16.5	168	31.9	241	11.5	314	2.7	387	54.1	460	61.1	533	3.8
23	7.3	96	10	169	29.2	242	14.2	315	7.3	388	55.3	461	61.4	534	6.9
24	8.8	97	4.6	170	25	243	15.4	316	11.5	389	55.3	462	61.4	535	9.6
25	10.8	98	1.5	171	25	244	16.1	317	15.4	390	56.1	463	61.1	536	11.1
26	12.3	99	0.4	172	26.1	245	16.1	318	18.4	391	56.4	464	60.7	537	11.1
27	13.1	100	0	173	27.6	246	16.9	319	20.7	392	56.4	465	59.9	538	10.4
28	12.3	101	0	174	29.2	247	16.5	320	24.2	393	56.4	466	59.1	539	8.8
29	12.3	102	0	175	31.1	248	16.9	321	26.9	394	57.2	467	59.1	540	9.2
30	11.5	103	0	176	32.3	249	18	322	29.6	395	56.8	468	59.1	541	10
31	11.5	104	0	177	34.2	250	19.2	323	31.1	396	57.6	469	59.9	542	10.4
32	11.1	105	0	178	34.9	251	20.4	324	32.6	397	57.6	470	59.5	543	10.4
33	11.1	106	0	179	35.7	252	20.4	325	33.8	398	57.6	471	59.9	544	5.4
34	11.1	107	0	180	36.5	253	21.1	326	34.9	399	58	472	58.8	545	1.9
35	13.1	108	0.4	181	36.9	254	21.1	327	36.9	400	58	473	58	546	0
36	15	109	1.2	182	36.9	255	22.3	328	39.2	401	58.4	474	57.6	547	0
37	16.9	110	1.9	183	37.2	256	23	329	41.1	402	58.4	475	56.8	548	0
38	16.9	111	3.8	184	37.6	257	23.8	330	43	403	58.8	476	56.1	549	0
39	16.1	112	7.7	185	37.2	258	24.2	331	43.8	404	59.1	477	55.3	550	0
40	15.7	113	11.5	186	37.6	259	24.6	332	44.5	405	58.8	478	54.1	551	0
41	15.4	114	14.6	187	38	260	25	333	45.3	406	58.8	479	52.6	552	0
42	15	115	18	188	38.4	261	25.7	334	45.3	407	58	480	49.2	553	0
43	13.8	116	21.5	189	39.2	262	25.7	335	44.9	408	58	481	46.1	554	0
44	10.8	117	25	190	39.6	263	26.5	336	44.5	409	57.6	482	43	555	0
45	8.4	118	28.4	191	39.9	264	27.6	337	43.8	410	57.6	483	37.2	556	0
46	6.1	119	30.7	192	40.7	265	28.4	338	43.4	411	57.6	484	29.6	557	0
47	4.2	120	31.9	193	40.3	266	29.2	339	42.6	412	57.6	485	21.5	558	0
48	3.5	121	32.3	194	41.1	267	30.3	340	41.9	413	57.6	486	16.5	559	0
49	3.5	122	32.3	195	41.1	268	31.1	341	41.5	414	59.1	487	15.7	560	0
50	1.5	123	31.9	196	40.7	269	31.1	342	40.7	415	59.5	488	18.4	561	0
51	0	124	30.3	197	31.9	270	30.7	343	40.3	416	59.9	489	21.5	562	0
52	0	125	28	198	23.9	271	31.1	344	41.1	417	60.3	490	25	563	0
53	0	126	24.2	199	15.9	272	29.6	345	41.5	418	60.3	491	27.3	564	0
54	0	127	20	200	7.9	273	29.2	346	42.6	419	61.1	492	29.2	565	0
55	0	128	16.1	201	2.7	274	29.2	347	43.4	420	60.3	493	30.7	566	0
56	0	129	11.5	202	0.4	275	28.8	348	44.2	421	59.9	494	31.5	567	0
57	0	130	8.1	203	0.4	276	28	349	44.9	422	59.5	495	31.1	568	0
58	0	131	5	204	2.7	277	23	350	45.7	423	59.1	496	31.1	569	0
59	0	132	3.5	205	3.8	278	21.1	351	46.5	424	59.1	497	30.3	570	0
60	0	133	1.9	206	3.8	279	21.5	352	46.8	425	59.5	498	30	571	0
61	0	134	0	207	1.5	280	20.7	353	47.2	426	59.5	499	30	572	0.4
62	0	135	0	208	0	281	20.7	354	48	427	59.5	500	29.6	573	1.5
63	1.2	136	0	209	0	282	19.6	355	47.6	428	59.9	501	30	574	3.5
64	3.5	137	0	210	0	283	16.5	356	48.4	429	60.3	502	28.8	575	6.1
65	7.7	138	0	211	0	284	13.1	357	48	430	60.7	503	28.8	576	10.4
66	11.1	139	0	212	0	285	9.6	358	47.2	431	60.7	504	28	577	14.2
67	13.8	140	0	213	0	286	7.3	359	46.1	432	61.4	505	28.4	578	16.9
68	16.5	141	0	214	0	287	3.8	360	45.7	433	61.8	506	28	579	19.2
69	18.4	142	0	215	0	288	0.8	361	44.9	434	61.8	507	28.4	580	20
70	20.4	143	1.5	216	0	289	0	362	44.2	435	61.8	508	28.4	581	21.5
71	20.7	144	6.9	217	0	290	0	363	43.8	436	61.8	509	28.8	582	23.4
72	19.6	145	12.7	218	0	291	0	364	44.5	437	61.1	510	28.4	583	24.6
73	17.3	146	16.5	219	0	292	0	365	44.9	438	60.7	511	28.4	584	24.2

Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)
585	20	651	24.6	717	28	783	20.4	849	30.7	915	63.4	981	38	1047	28
586	16.9	652	25	718	28	784	21.1	850	33.8	916	63	982	38	1048	23.8
587	13.4	653	26.5	719	27.6	785	22.3	851	37.6	917	63.4	983	38	1049	18.8
588	13.4	654	28	720	26.5	786	22.3	852	40.7	918	64.1	984	37.2	1050	11.9
589	15.7	655	29.6	721	24.6	787	22.7	853	43.8	919	64.9	985	36.9	1051	6.1
590	18.4	656	30.7	722	20.7	788	22.3	854	46.1	920	65.3	986	36.1	1052	1.5
591	21.1	657	32.3	723	16.5	789	22.7	855	48	921	64.5	987	35.7	1053	1.5
592	23.4	658	33	724	15	790	22.3	856	49.5	922	64.1	988	34.9	1054	4.2
593	25.3	659	34.2	725	14.2	791	23.8	857	51.5	923	63.4	989	34.9	1055	8.1
594	27.6	660	34.6	726	14.2	792	25.7	858	53	924	63.7	990	33.8	1056	10.4
595	28.8	661	35.3	727	13.8	793	27.6	859	54.5	925	63.4	991	31.5	1057	13.1
596	30.3	662	36.1	728	13.8	794	29.6	860	55.7	926	63.4	992	28.8	1058	15.4
597	30.7	663	36.1	729	11.9	795	30	861	56.8	927	63.4	993	25.7	1059	18
598	31.5	664	36.9	730	8.4	796	29.2	862	58	928	63.4	994	24.6	1060	20.4
599	31.1	665	36.9	731	4.2	797	27.6	863	59.1	929	63.7	995	23.4	1061	23
600	31.1	666	37.6	732	1.2	798	25	864	60.3	930	64.5	996	22.3	1062	25.3
601	30.3	667	37.6	733	0	799	23.8	865	61.1	931	65.3	997	21.5	1063	27.3
602	30.3	668	38.4	734	0	800	23.4	866	61.8	932	64.9	998	20	1064	28.8
603	30.3	669	38	735	0	801	24.2	867	61.8	933	63.7	999	20	1065	30.3
604	30.7	670	37.6	736	0	802	23.4	868	61.8	934	63	1000	19.2	1066	31.1
605	31.1	671	37.6	737	0	803	23	869	61.8	935	59.9	1001	19.2	1067	32.3
606	32.3	672	37.2	738	0	804	20.4	870	62.6	936	55.3	1002	18	1068	31.9
607	32.6	673	36.9	739	0	805	18.8	871	63.4	937	50.7	1003	11.9	1069	32.3
608	32.6	674	36.1	740	0	806	17.3	872	63	938	49.2	1004	6.9	1070	31.9
609	32.6	675	35.7	741	0	807	15	873	63	939	48	1005	2.7	1071	31.1
610	31.1	676	36.1	742	0	808	13.1	874	62.6	940	46.1	1006	0.8	1072	28.8
611	26.9	677	35.7	743	0	809	9.2	875	61.8	941	44.2	1007	0.4	1073	25
612	22.3	678	35.7	744	0	810	6.9	876	61.8	942	41.1	1008	0	1074	22.7
613	18	679	35.7	745	0	811	4.6	877	62.2	943	39.9	1009	0	1075	18.8
614	13.8	680	36.1	746	0	812	4.6	878	62.2	944	36.1	1010	0	1076	15.4
615	9.6	681	36.1	747	0	813	4.6	879	62.6	945	32.6	1011	0	1077	13.4
616	4.6	682	35.7	748	0	814	4.2	880	63.7	946	29.2	1012	0	1078	11.9
617	6.1	683	35.7	749	0	815	5.4	881	64.5	947	24.6	1013	0	1079	8.8
618	10	684	34.9	750	0	816	4.6	882	64.9	948	20.7	1014	0	1080	5
619	14.2	685	34.6	751	0	817	3.5	883	66	949	19.2	1015	0	1081	1.9
620	17.3	686	34.2	752	0	818	2.3	884	66	950	16.5	1016	0	1082	2.3
621	20	687	33.8	753	0	819	2.3	885	66.8	951	15	1017	0	1083	2.7
622	21.5	688	33.4	754	0	820	1.9	886	66.4	952	11.9	1018	0	1084	3.5
623	22.3	689	33	755	0	821	3.1	887	66.8	953	9.6	1019	0	1085	6.5
624	22.3	690	30.3	756	0	822	6.1	888	67.2	954	8.4	1020	0	1086	10.8
625	22.3	691	29.2	757	0	823	4.6	889	66.4	955	5.8	1021	0	1087	13.8
626	22.3	692	28.4	758	0	824	2.7	890	66.4	956	1.2	1022	0	1088	16.1
627	23	693	25	759	0	825	2.3	891	66	957	0	1023	0.4	1089	18.4
628	23	694	21.1	760	0	826	2.3	892	65.7	958	0	1024	2.7	1090	20.4
629	22.7	695	16.9	761	0	827	3.1	893	65.7	959	0	1025	6.1	1091	21.9
630	22.3	696	13.4	762	0	828	4.2	894	66.4	960	1.2	1026	9.2	1092	21.9
631	21.9	697	13.1	763	1.5	829	3.5	895	66	961	3.1	1027	11.5	1093	20.7
632	22.7	698	12.3	764	5.4	830	3.8	896	65.7	962	5	1028	14.2	1094	17.3
633	23.8	699	12.7	765	9.2	831	4.2	897	65.3	963	8.4	1029	16.1	1095	13.1
634	25	700	15.7	766	11.5	832	3.5	898	65.3	964	11.5	1030	18	1096	9.6
635	25.3	701	19.2	767	14.6	833	3.5	899	64.5	965	14.6	1031	20	1097	8.8
636	25.7	702	22.3	768	17.3	834	3.5	900	64.5	966	16.9	1032	21.5	1098	10.8
637	26.5	703	24.6	769	19.2	835	4.6	901	64.1	967	18.8	1033	23	1099	12.7
638	26.9	704	25.7	770	21.1	836	5.8	902	63.7	968	21.1	1034	24.2	1100	14.2
639	27.3	705	26.5	771	20.7	837	3.5	903	63.7	969	23.8	1035	25	1101	14.6
640	28	706	26.5	772	20.7	838	0.8	904	63.7	970	26.5	1036	25.7	1102	13.1
641	29.2	707	26.9	773	19.6	839	3.5	905	64.5	971	28	1037	26.9	1103	11.1
642	30	708	27.3	774	18.4	840	3.8	906	64.5	972	29.6	1038	27.6	1104	11.1
643	30	709	27.3	775	16.9	841	2.3	907	64.9	973	30.7	1039	27.6	1105	11.1
644	29.6	710	27.6	776	16.9	842	0	908	64.5	974	32.6	1040	28.4	1106	13.1
645	29.6	711	28.4	777	16.5	843	1.2	909	64.1	975	34.2	1041	29.2	1107	15.7
646	28.8	712	28.8	778	16.9	844	6.9	910	64.9	976	35.3	1042	29.2	1108	18.4
647	28.4	713	28.8	779	16.9	845	13.8	911	65.3	977	36.1	1043	30	1109	20.7
648	28	714	29.2	780	16.9	846	18.8	912	65.3	978	36.9	1044	29.6	1110	23.8
649	27.3	715	28.8	781	17.3	847	23.8	913	65.3	979	38	1045	29.6	1111	25.7
650	25.7	716	28.8	782	19.2	848	27.3	914	64.1	980	38	1046	28.8	1112	28

Hot 1435 Unified Test Cycle
(Speed vs Time Sequence)

Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)	Time (sec.)	Speed (mph)
1113	30	1154	14.6	1195	15.4	1236	0	1277	39.2	1318	37.2	1359	32.6	1400	11.1
1114	31.1	1155	12.3	1196	19.2	1237	0	1278	40.7	1319	36.5	1360	31.5	1401	13.1
1115	32.3	1156	9.2	1197	21.9	1238	0	1279	42.2	1320	34.6	1361	30	1402	15
1116	34.2	1157	5.8	1198	23.8	1239	0	1280	43.4	1321	31.5	1362	28.8	1403	16.9
1117	35.7	1158	1.9	1199	25	1240	3.5	1281	44.9	1322	29.6	1363	27.3	1404	16.9
1118	36.9	1159	0.4	1200	26.1	1241	10.4	1282	45.7	1323	29.2	1364	23.8	1405	16.1
1119	38.8	1160	0	1201	27.3	1242	15.4	1283	46.1	1324	28.8	1365	23	1406	15.7
1120	40.3	1161	0	1202	28.8	1243	17.3	1284	46.8	1325	28.8	1366	23	1407	15.4
1121	41.5	1162	0	1203	30	1244	17.3	1285	46.5	1326	28	1367	22.3	1408	15
1122	42.2	1163	0	1204	29.6	1245	18.4	1286	46.5	1327	28	1368	20.4	1409	13.8
1123	43	1164	0	1205	29.6	1246	21.5	1287	46.5	1328	28.4	1369	18.8	1410	10.8
1124	43.8	1165	0.4	1206	28.8	1247	24.6	1288	46.1	1329	29.6	1370	17.7	1411	8.4
1125	43.8	1166	4.2	1207	26.1	1248	27.3	1289	46.1	1330	30	1371	16.1	1412	6.1
1126	43.4	1167	9.2	1208	22.3	1249	30	1290	46.1	1331	30.3	1372	14.6	1413	4.2
1127	43	1168	11.9	1209	19.2	1250	31.5	1291	46.8	1332	29.2	1373	12.7	1414	3.5
1128	42.2	1169	14.2	1210	16.5	1251	31.9	1292	47.6	1333	26.5	1374	11.1	1415	3.5
1129	41.9	1170	15.7	1211	12.7	1252	32.6	1293	48	1334	25.3	1375	9.2	1416	1.5
1130	41.5	1171	15	1212	9.6	1253	33.4	1294	48.4	1335	25	1376	8.8	1417	0
1131	41.9	1172	14.2	1213	6.9	1254	34.9	1295	48	1336	24.6	1377	7.3	1418	0
1132	41.9	1173	13.4	1214	4.2	1255	36.5	1296	48	1337	24.6	1378	6.1	1419	0
1133	41.9	1174	13.8	1215	2.3	1256	37.6	1297	47.2	1338	25.3	1379	5	1420	0
1134	42.2	1175	14.6	1216	0.8	1257	39.2	1298	46.5	1339	26.1	1380	4.2	1421	0
1135	42.6	1176	14.6	1217	0	1258	40.3	1299	46.8	1340	27.3	1381	3.5	1422	0
1136	42.6	1177	14.2	1218	0	1259	40.7	1300	47.2	1341	28.4	1382	2.7	1423	0
1137	42.6	1178	16.1	1219	0	1260	41.1	1301	48.4	1342	29.2	1383	2.3	1424	0
1138	42.6	1179	15.7	1220	0	1261	40.7	1302	48.4	1343	29.2	1384	1.5	1425	0
1139	42.6	1180	15.7	1221	0	1262	40.7	1303	48.8	1344	29.6	1385	1.2	1426	0
1140	42.6	1181	14.6	1222	0	1263	40.7	1304	48.4	1345	30	1386	0	1427	0
1141	42.6	1182	13.1	1223	0	1264	41.5	1305	47.6	1346	31.1	1387	1.2	1428	0
1142	42.2	1183	10	1224	0	1265	42.6	1306	46.5	1347	32.6	1388	4.2	1429	0
1143	43	1184	7.3	1225	0	1266	43	1307	44.2	1348	33.8	1389	7.3	1430	0
1144	43.4	1185	3.5	1226	0	1267	44.5	1308	42.2	1349	34.6	1390	8.8	1431	0
1145	43	1186	0.8	1227	0	1268	45.3	1309	41.5	1350	34.9	1391	10.8	1432	0
1146	42.6	1187	0	1228	0	1269	45.3	1310	41.1	1351	34.6	1392	12.3	1433	0
1147	41.9	1188	0	1229	0	1270	44.9	1311	40.7	1352	34.9	1393	13.1	1434	0
1148	40.7	1189	0	1230	0	1271	43.4	1312	40.3	1353	34.6	1394	12.3	1435	0
1149	36.9	1190	0	1231	0	1272	40.3	1313	39.6	1354	34.9	1395	12.3		
1150	32.6	1191	0.4	1232	0	1273	38	1314	39.2	1355	34.9	1396	11.5		
1151	28	1192	2.7	1233	0	1274	36.1	1315	38.8	1356	34.9	1397	11.5		
1152	23.4	1193	7.3	1234	0	1275	36.5	1316	38	1357	34.2	1398	11.1		
1153	18.4	1194	11.5	1235	0	1276	38	1317	37.6	1358	33.8	1399	11.1		

Date of Release: February 22, 2012; Proposed 15-day Changes
Date of Hearing: January 26-27, 2012