

**C****BARCLAYS OFFICIAL CALIFORNIA CODE OF REGULATIONS****TITLE 13. MOTOR VEHICLES****DIVISION 3. AIR RESOURCES BOARD****CHAPTER 1. MOTOR VEHICLE POLLUTION CONTROL DEVICES****ARTICLE 1. GENERAL PROVISIONS**

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§ 1961. Exhaust Emission Standards and Test Procedures - 2004 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.

Introduction. This section 1961 contains the California "LEV II" exhaust emission standards for 2004 and subsequent model passenger cars, light-duty trucks and medium-duty vehicles. A manufacturer must demonstrate compliance with the exhaust standards in section 1961(a) applicable to specific test groups, and with the composite phase-in requirements in section 1961(b) applicable to the manufacturer's entire fleet. Section 1961(b) also includes the manufacturer's fleet-wide composite phase-in requirements for the 2001 - 2003 model years.

Prior to the 2004 model year, a manufacturer that produces vehicles that meet the standards in section 1961(a) has the option of certifying the vehicles to those standards, in which case the vehicles will be treated as LEV II vehicles for purposes of the fleet-wide phase-in requirements. Similarly, 2004 - 2006 model-year

vehicles may be certified to the "LEV I" exhaust emission standards in section 1960.1(g)(1) and (h)(2), in which case the vehicles will be treated as LEV I vehicles for purposes of the fleet-wide phase-in requirements.

A manufacturer has the option of certifying engines used in incomplete and diesel medium-duty vehicles with a gross vehicle weight rating of greater than 8,500 lbs. to the heavy-duty engine standards and test procedures set forth in [title 13, CCR, sections 1956.8\(c\), \(g\) and \(h\)](#).

(a) Exhaust Emission Standards.

(1) "LEV II" Exhaust Standards. The following standards represent the maximum exhaust emissions for the intermediate and full useful life from new 2004 and subsequent model-year "LEV II" 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:

LEV II Exhaust Mass Emission Standards for New 2004 and Subsequent Model LEVs, ULEVs, and SULEVs in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes

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Vehicle Type	Durability Vehicle Basis (mi)	Vehicle Emission Category	NMOG (g/mi)	Carbon Monoxide (g/mi)	Oxides of Nitrogen (g/mi)	Particulates (g/mi)	
						Formaldehyde (mg/mi)	
All PCs; LDTs 8500 lbs. GVW or less	50,000	LEV	0.075	3.4	0.05	15	n/a
		LEV, Option 1	0.075	3.4	0.07	15	n/a
Vehicles in this category are tested at their loaded vehicle weight	120,000	ULEV	0.040	1.7	0.05	8	n/a
		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 8501 – 10,000 lbs. GVW	120,000	LEV	0.195	6.4	0.2	32	0.12
		ULEV	0.143	6.4	0.2	16	0.06
Vehicles in this category are tested at their adjusted loaded vehicle weight	150,000 (Optional)	SULEV	0.100	3.2	0.1	8	0.06
		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
MDVs 10,001–14,000 lbs. GVW	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
Vehicles in this category are tested at their adjusted loaded vehicle weight	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

(2) Reactivity Adjustment in Determining Compliance with the NMOG Standard

(A) The NMOG emission results from all TLEVs, LEVs, ULEVs and SULEVs certifying on a fuel other than conventional gasoline shall be numerically adjusted to establish an NMOG exhaust mass emission value equivalent. The manufacturer shall multiply measured NMOG exhaust emission results by the appropriate reactivity adjustment factor set forth in section 1961(a)(2)(B) or established in accordance with the test procedures incorporated by reference in section 1961(d). The reactivity adjustment factor represents the

ratio of the NMOG specific reactivity of a low-emission vehicle designed to operate on a fuel other than conventional gasoline compared to the NMOG baseline specific reactivity of vehicles in the same vehicle emission category operated on conventional gasoline.

(B) The following reactivity adjustment factors apply:

Light-Duty Vehicles			Medium-Duty Vehicles		
0-6000 lbs. GVW					
6001 lbs. - 14,000 lbs. GVW					
	TLEV	LEV	ULEV	LEV	ULEV
Fuel					
Baseline Specific Reactivity (grams ozone / gram NMOG)					

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Conventional Gasoline	3.42	3.13	3.13	3.13	3.13
	Reactivity Adjustment Factors				
RFG (through the 2003 model year)	0.98	0.94	0.94	0.94	0.94
M85	0.41	0.41	0.41	0.41	0.41
Natural Gas	1.0	0.43	0.43	0.43	0.43
LPG	1.0	0.50	0.50	0.50	0.50
	Methane Reactivity Adjustment Factors				
Natural Gas	0.0043	0.0047	0.0047	0.0047	0.0047

(3) NMOG Standards for Bi-Fuel, Fuel-Flexible and Dual-Fuel Vehicles Operating on Gasoline. For fuel-flexible, bi-fuel, and dual-fuel PCs, LDTs and MDVs, compliance with the NMOG exhaust mass emission standards shall be based on exhaust emission tests both when the vehicle is operated on the gaseous or alcohol fuel it is designed to use, and when the vehicle is operated on gasoline. A manufacturer must demonstrate compliance with the applicable exhaust mass emission standards for NMOG, CO, NOx and formaldehyde set forth in the table in section 1961(a)(1) when certifying the vehicle for operation on the gaseous or alcohol fuel.

result when operating on gasoline. A manufacturer may measure NMHC in lieu of NMOG when fuel-flexible, bi-fuel and dual-fuel vehicles are operated on gasoline, in accordance with the test procedures incorporated by reference in section 1961(d). Testing at 50<sup>0</sup>F is not required for fuel-flexible, bi-fuel and dual-fuel vehicles when operating on gasoline. The applicable CO, NOx and formaldehyde standards are set forth in section 1961(a)(1).

LEV II NMOG Standards for Bi-Fuel, Fuel-Flexible and Dual-Fuel Vehicles Operating on Gasoline (g/mi)

The following standards represent the maximum NMOG emissions when the vehicle is operating on gasoline. A manufacturer shall not apply a reactivity adjustment factor to the exhaust NMOG mass emission

Vehicle Type	Vehicle Durability		Vehicle Basis
	Emission Category		
All PCs; LDTs, 0-8500 lbs. GVW	LEV	50,000 mi	120,000 mi
	ULEV	0.125	0.156
	SULEV	0.075	0.090
MDVs, 8501-10,000 lbs. GVW	LEV	0.010	0.040
	ULEV	n/a	0.230
	SULEV	n/a	0.167
MDVs, 10,001-14,000 lbs. GVW	LEV	n/a	0.117
	ULEV	n/a	0.280
	SULEV	n/a	0.195
	SULEV	n/a	0.143

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(4) 50°F Exhaust Emission Standards. All light- and medium-duty LEVs, ULEVs and SULEVs must demonstrate compliance with the following exhaust emission standards for NMOG and formaldehyde (HCHO) measured on the FTP (40 CFR, Part 86, Subpart B) conducted at a nominal test temperature of 50°F, as modified by Part II, Section C of the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles" incorporated by reference in section 1961(d). The NMOG mass emission result shall be multiplied by the applicable reactivity adjustment factor, if any, prior to comparing to the applicable adjusted 50,000 mile certification standards set forth below. A manufacturer may demonstrate compliance with the NMOG and HCHO certification standards contained in this subparagraph by measuring NMHC exhaust

emissions or issuing a statement of compliance for HCHO in accordance with Section D.1, subparagraph (p) and Section G.3.1.2, respectively, of the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles" incorporated by reference in section 1961(d). Emissions of CO and NOx measured at 50°F shall not exceed the standards set forth in §1961(a)(1) applicable to vehicles of the same emission category and vehicle type subject to a cold soak and emission test at 68° to 86°F. Natural gas and diesel-fueled vehicles are exempt from the 50°F test requirements.

Vehicle Weight Class	Vehicle Emission Category (g/mi)					
	LEV	ULEV	SULEV			
	NMOG	HCHO	NMOG	HCHO	NMOG	HCHO
PCs; LDTs 0-8500 lbs. GVW	0.150	0.030	0.080	0.016	0.020	0.008
MDVs 8501-10,000 lbs. GVW	0.390	0.064	0.286	0.032	0.200	0.016
MDVs 10,001-14,000 lbs. GVW	0.460	0.080	0.334	0.042	0.234	0.020

(5) Cold CO Standard. The following standards represent the 50,000 mile cold temperature exhaust carbon monoxide emission levels from new 2001 and subsequent model-year passenger cars, light-duty trucks, and medium-duty vehicles:

**TEMPERATURE CARBON MONOXIDE EXHAUST EMISSIONS STANDARDS FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES (grams per mile)**

**2001 AND SUBSEQUENT MODEL-YEAR COLD**

Vehicle Type	Carbon Monoxide
All PCs, LDTs 0-3750 lbs. LVW	10.0
LDTs, 3751 lbs. LVW - 8500 lbs. GVW;	12.5
LEV I and Tier 1 MDVs 8500 lbs. GVW and less	

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These standards are applicable to vehicles tested at a nominal temperature of 20<sup>0</sup>F (-7<sup>0</sup>C) in accordance with 40 CFR Part 86 Subpart C, as amended by the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles" incorporated by reference in section 1961(d). Natural gas, diesel-fueled and zero-emission vehicles are exempt from these standards.

(6) Highway NOx Standard. The maximum emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR 600 Subpart B, which is incorporated herein by reference) shall not be greater than 1.33 times the applicable PC and LDT standards or 2.0 times the applicable MDV standards set forth in section 1961(a)(1). Both the projected emissions and the HWFET standard shall be rounded in accordance with ASTM E29-67 to the nearest 0.1 g/mi (or 0.01 g/mi for vehicles certified to the 0.05 or 0.02 g/mi NOx standards) before being compared.

(7) Supplemental Federal Test Procedure (SFTP) Off-Cycle Emission Standards. The SFTP exhaust emission levels from new 2004 and subsequent model LEVs, ULEVs, and SULEVs shall not exceed the standards set forth in section 1960.1(r).

(8) Requirements for Vehicles Certified to the Optional 150,000 Mile Standards.

(A) Requirement to Generate Additional Fleet Average NMOG Credit. A vehicle that is certified to the 150,000 mile standards in section 1961(a) shall generate additional NMOG fleet average credit as set forth in 1961(b)(1) or additional vehicle equivalent credits as set forth in 1961(b)(2) provided that the manufacturer ex-

tends the warranty on high cost parts to 8 years or 100,000 miles, whichever occurs first, and agrees to extend the limit on high mileage in-use testing to 112,500 miles.

(B) Requirement to Generate a Partial ZEV Allowance. A vehicle that is certified to the 150,000 mile SULEV standards shall 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 2005 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," incorporated by reference in section 1962.

(9) Optional LEV II NOx Standard. A manufacturer may certify up to 4% of its light-duty truck fleet from 3751 lbs. LVW - 8500 lbs. GVW with a maximum base payload of 2500 lbs. or more to the LEV, option 1, standard set forth in 1961(a)(1) based on projected sales of trucks in the LDT2 category. Passenger cars and light-duty trucks 0-3750 lbs. LVW are not eligible for this option.

(10) Intermediate In-Use Compliance Standards. For test groups certified prior to the 2007 model year, the following intermediate in-use compliance standards shall apply for the first two model years the test group is certified to the new standard. For SULEVs certified prior to the 2004 model year, the following intermediate in-use compliance SULEV standards shall apply through the 2006 model year.

Emission Category	Durability Vehicle Basis	LEV II PCs and LDTs		LEV II MDVs 8500 - 10,000 lbs. GVW
		NMOG	NOx	NOx
LEV/ULEV	50,000	n/a	0.07	n/a
	120,000	n/a	0.10	0.3
	150,000	n/a	0.10	0.3
LEV, Option 1	50,000	n/a	0.10	n/a

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	120,000	n/a	0.14	n/a
	150,000	n/a	0.14	n/a
SULEV	120,000	0.020	0.03	0.15
	150,000	0.020	0.03	0.15

(11) NMOG Credit for Vehicles with Zero-Evaporative Emissions. In determining compliance of a vehicle with the applicable exhaust NMOG standard, a gram per mile NMOG factor, to be determined by the Executive Officer based on available data, shall be subtracted from the reactivity-adjusted NMOG exhaust emission results for any vehicle that has been certified to the "zero" evaporative emission standard set forth in [title 13, CCR, section 1976\(b\)\(1\)\(E\)](#). This credit shall not apply to a SULEV that generates a partial ZEV allowance.

(12) NMOG Credit for Direct Ozone Reduction Technology. A manufacturer that certifies vehicles equipped with direct ozone reduction technologies shall be eligible to receive NMOG credits that can be applied to the NMOG exhaust emissions of the vehicle when determining compliance with the standard. In order to receive credit, the manufacturer must submit the following information for each vehicle model, including, but not limited to:

(A) a demonstration of the airflow rate through the direct ozone reduction device and the ozone-reducing efficiency of the device over the range of speeds encountered in the Unified Cycle Driving Schedule.

(B) an evaluation of the durability of the device for the full useful life of the vehicle; and

(C) a description of the on-board diagnostic strategy for monitoring the performance of the device in-use.

Using the above information, the Executive Officer shall determine the value of the NMOG credit based on the calculated change in the one-hour peak ozone level using an approved airshed model.

(13) NOx Credits for Pre-2004 MDVs Certified to the LEV I LEV or ULEV Standards. Prior to the 2004 model

year, a manufacturer may earn a 0.02 g/mi per vehicle NOx credit for MDVs between 6,000-8500 lbs. GVW certified to the LEV I LEV or ULEV standards for PCs and LDTs set forth in section 1960.1(g)(1). The manufacturer may apply the credit on a per vehicle basis to the NOx emissions of LDTs between 6,000-8500 lbs. GVW certified to the PC/LDT LEV or ULEV standards in section 1961(a)(1) for the 2004 through 2008 model years.

(14) When a Federally-Certified Vehicle Model is Required in California.

(A) General Requirement. Whenever a manufacturer federally-certifies a 2004 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 emission 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 in Tables S04-1 and S04-2 of [40 CFR § 86.1811-04\(c\)](#) as adopted February 10, 2000. The criteria for applying this requirement are set forth in Part I. Section H.1 of the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," as incorporated by reference in section 1961(d).

(B) Exception for clean fuel fleet vehicles. Section

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1961(a)(14)(A) does not apply in the case of a federally-certified vehicle model that is only marketed to fleet operators for applications that are subject to clean fuel fleet requirements established pursuant to section 246 of the federal Clean Air Act (42 U.S.C. sec. 7586). In addition, the Executive Officer shall exclude from the requirement a federally-certified vehicle model where the manufacturer demonstrates to the Executive Officer's reasonable satisfaction that the model will primarily be sold or leased to clean fuel fleet operators for such applications, and that other sales or leases of the model will be incidental to marketing to those clean fuel fleet operators.

(C) Opt-in for 2003 or prior model year vehicles. A manufacturer may certify a passenger car, light-duty truck or medium-duty vehicle to federal exhaust emission standards pursuant to section 1961(a)(14)(A) prior to the 2004 model year.

(15) Emission Standard for a Fuel-Fired Heater. Whenever a manufacturer elects to utilize an on-board fuel-fired heater on any passenger car, light-duty truck or medium-duty vehicle, the fuel-fired heater must meet LEV II ULEV standards for passenger cars and light-

duty trucks less than 8,500 pounds GVW as set forth in section 1961(a)(1). On-board fuel-fired heaters may not be operable at ambient temperatures above 40<sup>0</sup>F.

(b) Emission Standards Phase-In Requirements for Manufacturers.

(1) Fleet Average NMOG Requirements for Passenger Cars and Light-Duty Trucks.

(A) The fleet average non-methane organic gas exhaust mass emission values from the passenger cars and light-duty trucks certified to the Tier 1, LEV I and LEV II standards that are produced and delivered for sale in California each model year by a manufacturer other than a small volume manufacturer or an independent low volume manufacturer shall not exceed:

**FLEET AVERAGE NON-METHANE ORGANIC GAS EXHAUST MASS EMISSION REQUIREMENTS FOR LIGHT-DUTY VEHICLE WEIGHT CLASSES (50,000 mile Durability Vehicle Basis)**

Model Year	Fleet Average NMOG (grams per mile)	
	All PCs; LDTs 0-3750 lbs.	LDTs 3751 lbs. LVW - 8500 lbs. LVW GVW
2001	0.070	0.098
2002	0.068	0.095
2003	0.062	0.093
2004	0.053	0.085
2005	0.049	0.076
2006	0.046	0.062
2007	0.043	0.055
2008	0.040	0.050
2009	0.038	0.047
2010+	0.035	0.043

(B) Calculation of Fleet Average NMOG Value.

1. Basic Calculation.

a. Each manufacturer's PC and LDT1 fleet average NMOG value for the total number of PCs and LDT1s produced and delivered for sale in California shall be

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calculated as follows:

$(\llbracket \sigma \rrbracket \text{ [Number of vehicles in a test group x applicable emission standard] +$

$\llbracket \sigma \rrbracket \text{ [Number of hybrid electric vehicles in a test group x HEV NMOG factor]}) /$

Total Number of Vehicles Produced, Including ZEVs and HEVs

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

$\llbracket \sigma \rrbracket \text{ [Number of vehicles in a test group x applicable emission standard] +}$

$\llbracket \sigma \rrbracket \text{ [Number of hybrid electric vehicles in a test group x HEV NMOG factor]}) /$

Total Number of Vehicles Produced, 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	
		All PCs; LDTs 0-3750 lbs. LVW	LDTs 3751-5750 lbs. LVW
2001 and subsequent (§1960.5 "AB 965" vehicles only)	All	Federal Emission Standard to which Vehicle is Certified	Federal Emission Standard to which Vehicle is Certified
2001 - 2003 (§1960.1(f)(2))	Tier 1	0.25	0.32
2001 - 2006 model year vehicles certified to the "LEV I" standards in §1960.1(g)(1) (For TLEVs, 2001 - 2003 model years only)	TLEVs	0.125	0.160
	LEVs	0.075	0.100
	ULEVs	0.040	0.050
Model Year	Emission Category	All PCs; LDTs 0-3750 lbs. LVW	LDTs 3751 lbs. LVW-8500 lbs. GVW
2004 and subsequent model year vehicles certified to the "LEV II" standards in §1961(a)(1)	LEVs	0.075	0.075
	ULEVs	0.040	0.040
	SULEVs	0.01	0.01
2004 and subsequent model year	LEVs	0.06	0.06



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vehicles certified to the optional 150,000 mile "LEV II" standards for PCs and LDTs in 1961(a)(1)	ULEVs	0.03	0.03
	SULEVs	0.0085	0.0085

2. HEV NMOG Factor. The HEV NMOG factor for light-duty vehicles is calculated as follows:

$$\text{LEV HEV Contribution Factor} = 0.075 - [(\text{Zero-emission VMT Factor}) \times 0.035]$$

$$\text{ULEV HEV Contribution Factor} = 0.040 - [(\text{Zero-emission VMT Factor}) \times 0.030]$$

where Zero-emission VMT Factor for HEVs is determined in accordance with section 1962.

3. Federally-Certified Vehicles. A vehicle certified to the federal standards for a federal exhaust emissions bin in accordance with Section H.1 of the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," as incorporated by reference in section 1961(d), shall use the corresponding intermediate useful life NMOG standard to which the vehicle is deemed certified in the fleet average calculation.

(C) Requirements for Small Volume Manufacturers.

1. In 2001 through 2006 model years, a small volume manufacturer shall not exceed a fleet average NMOG value of 0.075 g/mi for PCs and LDTs from 0-3750 lbs. LVW or 0.100 g/mi for LDTs from 3751-5750 lbs. LVW calculated in accordance with section 1961(b)(1)(B). In 2007 and subsequent model years, a small volume manufacturer shall not exceed a fleet average NMOG value of 0.075 for PCs and LDTs from 0-3750 lbs. LVW or 0.075 for LDTs from 3751 lbs. LVW - 8500 lbs. GVW calculated in accordance with section 1961(b)(1)(B).

2. If a manufacturer's average California sales exceed 4500 units of new PCs, LDTs, MDVs and heavy duty engines based on the average number of vehicles

sold for the three previous consecutive model years, the manufacturer shall no longer be treated as a small volume manufacturer and shall comply with the fleet average requirements applicable to larger manufacturers as specified in section 1961(b)(1) beginning with the fourth model year after the last of the three consecutive model years.

3. If a manufacturer's average California sales fall below 4500 units of new PCs, LDTs, MDVs and heavy duty engines based on the average number of vehicles sold for the three previous consecutive model years, the manufacturer shall be treated as a small volume manufacturer and shall be subject to the requirements for small volume manufacturers beginning with the next model year.

(D) Phase-in Requirements for Independent Low Volume Manufacturers. In 2001 through 2006 model years, an independent low volume manufacturer shall not exceed a fleet average NMOG value of 0.075 g/mi for PCs and LDTs from 0-3750 lbs. LVW or 0.100 g/mi for LDTs from 3751-5750 lbs. LVW calculated in accordance with section 1961(b)(1)(B). In 2007 and subsequent model years, an independent low volume manufacturer shall not exceed a fleet average NMOG value of 0.060 for PCs and LDTs from 0-3750 lbs. LVW or 0.065 g/mi for LDTs from 3751 lbs. LVW - 8500 lbs. GVW calculated in accordance with section 1961(b)(1)(B).

(E) Treatment of ZEVs. ZEVs classified as LDTs (>3750 lbs. LVW) that have been counted toward the ZEV requirement for PCs and LDTs (0-3750 lbs. LVW) as specified in section 1962 shall be included as LDT1s in the calculation of a fleet average NMOG value.

(2) LEV II Phase-In Requirement for PCs and LDTs. Beginning in the 2004 model year, a manufacturer, ex-

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cept a small volume manufacturer or an independent low volume manufacturer, shall certify a percentage of its PC and LDT fleet to the LEV II standards in section 1961(a) according to the following phase in schedule:

Model Year	PC/LDT1 (%)	LDT2 (%)
2004	25	25
2005	50	50
2006	75	75
2007	100	100

In determining compliance with the phase-in schedule, the fleet shall consist of LEV I and LEV II PCs and LDT1s for the PC/LDT1 calculation, and LEV I and LEV II LDT2s for the LDT2 calculation. LEV I MDVs are not counted in the calculation until they are certified as LEV II LDT2s.

A manufacturer may use an alternative phase-in schedule to comply with these phase-in requirements as long as equivalent NOx emission reductions are achieved by the 2007 model year from each of the two categories - PC/LDT1 and LDT2. Model year emission reductions shall be calculated by multiplying the percent of either PC/LDT1 or LDT2 vehicles meeting the LEV II standards in a given model year (based on a manufacturer's projected sales volume of vehicles in each category) by 4 for the 2004 model year, 3 for the 2005 model year, 2 for the 2006 model year and 1 for the 2007 model year. The yearly results for PCs/LDT1s shall be summed together to determine a separate cumulative total for PCs/

LDT1s and the yearly results for LDT2s shall be summed together to determine a cumulative total for LDT2s. The cumulative total for each category must be equal to or exceed 500 to be considered equivalent. A manufacturer may add vehicles introduced before the 2004 model year (e.g., the percent of vehicles introduced in 2003 would be multiplied by 5) to the cumulative total.

**(3) Medium-Duty Vehicle Phase-In Requirements.**

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

Model Year	Vehicles Certified to §1960.1(h)(1), (h)(2), and §1961(a)(1) (%)		Vehicles Certified to §1956.8(g) or (h) (%)		
	LEV	ULEV	Tier 1	LEV	ULEV
2001	80	20	100	0	0
2002	70	30	0	100	0
2003	60	40	0	100	0
2004 +	40	60	0	0	100

(B) Phase-In Requirements for LEV II MDVs. For the 2004 through 2006 model years, a manufacturer,

other than a small volume manufacturer must phase-in at least one test group per model year to the MDV LEV

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II standards. All 2007 and subsequent model year MDVs, including those produced by a small volume manufacturer, are subject to the LEV II MDV standards. Beginning in the 2005 model year, all medium-duty engines certified to the optional medium-duty engine standards in [title 13, CCR §1956.8\(c\) or \(h\)](#), including those produced by a small volume manufacturer, must meet the standards set forth in [title 13, CCR §1956.8\(c\) or \(h\)](#), as applicable. A manufacturer that elects to certify to the Option 1 or Option 2 federal standards as set forth in [40 CFR §86.005-10\(f\)](#) is not subject to these phase-in requirements.

(C) Identifying a Manufacturer's MDV Fleet. For the 2001 and subsequent model years, each manufacturer's MDV fleet shall be defined as the total number of California-certified MDVs produced and delivered for sale in California. The percentages shall be applied to the manufacturers' total production of California-certified medium-duty vehicles delivered for sale in California. For the 2005 and subsequent model years, a manufacturer that elects to the optional medium-duty engine standards in [title 13, CCR, §1956.8\(c\) or \(h\)](#) shall not count those engines in the manufacturer's total production of California-certified medium-duty vehicles for purposes of this subsection.

(D) Requirements for Small Volume Manufacturers. In 2001 through 2003 model years, a small volume manufacturer shall certify, produce, and deliver for sale in California vehicles or engines certified to the MDV Tier 1 standards in a quantity equivalent to 100% of its MDV fleet. In 2004 through 2006 model years, a small volume manufacturer shall certify, produce, and deliver for sale in California vehicles or engines certified to the MDV LEV I standard in a quantity equivalent to 100% of its MDV fleet. Engines certified to these MDV LEV I standards are not be eligible for emissions averaging.

(E) For a manufacturer that elects to certify to the optional medium-duty engine standards in [title 13, CCR §1956.8\(c\) or \(h\)](#), all such 2005 and subsequent model year MDVs, including those produced by a small volume manufacturer, shall be subject to the emissions averaging provisions applicable to heavy-duty diesel or Otto-cycle engines as set forth in the "California Ex-

haust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines," or the "California Exhaust Emissions Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines, incorporated by reference in [§1956.8\(b\) or \(d\)](#), as applicable.

## (c) Calculation of NMOG Credits/Debits

(1) Calculation of NMOG Credits for Passenger Cars and Light-Duty Trucks. In 2001 and subsequent model years, a manufacturer that achieves fleet average NMOG values lower than the fleet average NMOG requirement for the corresponding model year shall receive credits in units of g/mi NMOG determined as:

$$[(\text{Fleet Average NMOG Requirement}) - (\text{Manufacturer's Fleet Average NMOG Value})] \times (\text{Total No. of Vehicles Produced and Delivered for Sale in California, Including ZEVs and HEVs}).$$

A manufacturer with 2001 and subsequent model year fleet average NMOG values greater than the fleet average requirement for the corresponding model year shall receive debits in units of g/mi NMOG equal to the amount of negative credits determined by the aforementioned equation. For the 2001 and subsequent model years, the total g/mi NMOG credits or debits earned for PCs and LDTs 0- 3750 lbs. LVW, for LDTs 3751-5750 lbs. LVW and for LDTs 3751 lbs. LVW - 8500 lbs. GVW shall be summed together. The resulting amount shall constitute the g/mi NMOG credits or debits accrued by the manufacturer for the model year.

(2) Calculation of Vehicle Equivalent NMOG Credits for Medium-Duty Vehicles.

(A) In 2001 and subsequent model years, a manufacturer that produces and delivers for sale in California MDVs in excess of the equivalent requirements for LEVs, ULEVs and/or SULEVs certified to the exhaust emission standards set forth in section 1961(a)(1) or to the exhaust emission standards set forth in [Title 13, CCR, Section 1956.8\(h\)](#) shall receive "Vehicle-Equivalent Credits" (or "VECs") calculated in accordance with the following equation, where the term "produced"

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means produced and delivered for sale in California:

$$\begin{aligned} & [( \text{No. of LEVs Produced excluding HEVs} ) + \\ & ( \text{No. of LEV HEVs} \times \text{HEV VEC factor for LEVs} ) ] + \\ & ( 1.20 \times \text{No. of LEVs certified to the 150,000 mile stand-} \\ & \text{ards} ) - \\ & ( \text{Equivalent No. of LEVs Required to be Produced} ) + \\ & [ ( 1.4 \times ( \text{No. of ULEVs Produced excluding HEVs} ) + \\ & ( \text{No. of ULEV HEVs} \times \text{HEV VEC factor for ULEVs} ) ) + \\ & ( 1.50 \times \text{No. of ULEVs certified to the 150,000 mile} \\ & \text{standards} ) - [ ( 1.4 \times ( \text{Equivalent No. of ULEVs Re-} \\ & \text{quired to be Produced} ) ) ] + \\ & [ ( 1.7 \times ( \text{No. of SULEVs Produced excluding HEVs} ) + \\ & ( \text{No. of SULEV HEVs} \times \text{HEV VEC factor for} \\ & \text{SULEVs} ) ] + \\ & ( 1.75 \times \text{No. of SULEVs certified to the 150,000 mile} \\ & \text{standards} ) - [ ( 1.7 \times [ ( \text{Equivalent No. of SULEVs Re-} \\ & \text{quired to be Produced} ) ] ) + \\ & [ ( 2.0 \times ( \text{No. of ZEVs Certified and Produced as} \\ & \text{MDVs} ) ]. \end{aligned}$$

MDVs certified prior to the 2004 model year to the LEV I LEV or ULEV standards for PCs and LDTs 0-3750 lbs. LVW set forth in section E.1 of these test procedures shall receive VECs calculated in accordance with the following equation, where the term "produced" means produced and delivered for sale in California:

$$\begin{aligned} & [ ( 1.6 \times ( \text{No. of MDVs meeting the LEV I LEV stand-} \\ & \text{ards for PCs and LDTs 0-3750 lbs. LVW excluding} \\ & \text{HEVs} ) + ( \text{No. of HEVs meeting the LEV I LEV stand-} \\ & \text{ards for PCs and LDTs 0-3750 lbs. LVW} \times \text{HEV VEC} \\ & \text{factor for MDVs meeting the LEV I LEV standards for} \\ & \text{PCs and LDTs 0-3750 lbs. LVW} ) ] + [ ( 1.65 \times \text{No. of} \\ & \text{MDVs certified to the 150,000 mile LEV I LEV stand-} \\ & \text{ards for PCs and LDTs 0-3750 lbs. } ) ] + [ ( 1.8 \times ( \text{No. of} \\ & \text{MDVs meeting the LEV I ULEV standards for PCs and} \\ & \text{LDTs 0-3750 lbs. LVW excluding HEVs} ) + ( \text{No. of} \\ & \text{HEVs meeting the LEV I ULEV standards for PCs and} \end{aligned}$$

LDTs 0-3750 lbs. LVW x HEV VEC factor for MDVs meeting the LEV I ULEV standards for PCs and LDTs 0-3750 lbs. LVW)]+ [(1.85 x No. of MDVs certified to the 150,000 mile LEV I ULEV standards for PCs and LDTs 0-3750 lbs.)].

(B)MDV HEV VEC factor. The MDV HEV VEC factor is calculated as follows:

$$1 + [ ( \text{LEV standard} - \text{ULEV standard} ) \times ( \text{Zero-emission VMT Factor} ) \text{ BLEV standard} ] \text{ for LEVs};$$

$$1 + [ ( \text{ULEV standard} - \text{SULEV standard} ) \times ( \text{Zero-emission VMT Factor} ) \text{ BULEV standard} ] \text{ for ULEVs};$$

$$1 + [ ( \text{SULEV standard} - \text{ZEV standard} ) \times ( \text{Zero-emission VMT Factor} ) \text{ BSULEV standard} ] \text{ for SULEVs};$$

where "Zero-emission VMT Factor" for an HEV is determined in accordance with section 1962.

The HEV VEC factor for MDVs prior to model year 2004 meeting the LEV I LEV and ULEV standards for PCs and LDTs 0-3750 lbs. LVW is calculated as follows:

$$1 + [ ( \text{MDV SULEV standard} - \text{PC LEV I LEV standard} ) \times ( \text{Zero-emission VMT Factor} ) \text{ BPC LEV I LEV standard} ] \text{ for MDVs meeting the LEV I LEV standards for PCs and LDTs 0-3750 lbs. LVW};$$

$$1 + [ ( \text{MDV SULEV standard} - \text{PC ULEV standard} ) \times ( \text{Zero-emission VMT Factor} ) \text{ BPC LEV I ULEV standard} ] \text{ for MDVs meeting the ULEV I LEV standards for PCs and LDTs 0-3750 lbs. LVW}.$$

(C) A manufacturer that fails to produce and deliver for sale in California the equivalent quantity of MDVs certified to LEV, ULEV and/or SULEV exhaust emission standards, shall receive "Vehicle-Equivalent Debits" (or "VEDs") equal to the amount of negative VECs determined by the equation in section 1961(c)(2)(A).

(D) Only ZEVs certified as MDVs and not used to meet the ZEV requirement shall be included in the calcula-

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tion of VECs.

**(3) Procedure for Offsetting Debits.**

(A) A manufacturer shall equalize emission debits by earning g/mi NMOG emission credits or VECs in an amount equal to the g/mi NMOG debits or VEDs, or by submitting a commensurate amount of g/mi NMOG credits or VECs to the Executive Officer that were earned previously or acquired from another manufacturer. For 2001 through 2003 and for 2007 and subsequent model years, manufacturers shall equalize emission debits by the end of the following model year. For 2004 through 2006 model years, a manufacturer shall equalize NMOG debits for PCs and LDTs and LEV II MDVs within three model years and prior to the end of the 2007 model year. If emission debits are not equalized within the specified time period, the manufacturer shall be 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 emission 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 passenger cars and light-duty trucks not meeting the state board's emission standards shall be determined by dividing the total amount of g/mi NMOG emission debits for the model year by the g/mi NMOG fleet average requirement for PCs and LDTs 0-3750 lbs. LVW applicable for the model year in which the debits were first incurred and the number of medium-duty vehicles not meeting the state board's emission standards shall be equal to the amount of VEDs incurred.

(B) The emission credits earned in any given model year shall retain full value through the subsequent model year. The value of any credits not used to equalize the previous model-year's debit shall be discounted by 50% at the beginning of second model year after being earned, shall be discounted to 25% of its original value if not used by the beginning of the third model year after being earned, and will have no value if not used by the beginning of the fourth model year after being earned.

(d) Test Procedures. The certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," as amended May 2, 2008 and the "California Non-Methane Organic Gas Test Procedures," as amended July 30, 2002, which are incorporated herein by reference. In the case of hybrid electric vehicles and on-board fuel-fired heaters, the certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the "California Exhaust Emission Standards and Test Procedures for 2005 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," incorporated by reference in section 1962.

(e) Abbreviations. The following abbreviations are used in this section 1961:

"ALVW" means adjusted loaded vehicle weight.

"ASTM" means American Society of Testing and Materials.

"CO" means carbon monoxide.

"FTP" means Federal Test Procedure.

"g/mi" means grams per mile.

"GVW" means gross vehicle weight.

"GVWR" means gross vehicle weight rating.

"HEV" means hybrid-electric vehicle.

"LDT" means light-duty truck.

"LDT1" means a light-duty truck with a loaded vehicle weight of 0-3750 pounds.

"LDT2" means a "LEV II" light-duty truck with a loaded vehicle weight of 3751 pounds to a gross vehicle weight of 8500 pounds or a "LEV I" light-duty truck

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with a loaded vehicle weight of 3751-5750 pounds.

"LEV" means low-emission vehicle.

"LPG" means liquefied petroleum gas.

"LVW" means loaded vehicle weight.

"MDV" means medium-duty vehicle.

"mg/mi" means milligrams per mile.

"NMHC" means non-methane hydrocarbons.

"Non-Methane Organic Gases" or "NMOG" means the total mass of oxygenated and non-oxygenated hydrocarbon emissions.

"NOx" means oxides of nitrogen.

"PC" means passenger car.

"SULEV" means super-ultra-low-emission vehicle.

"TLEV" means transitional low-emission vehicle.

"ULEV" means ultra-low-emission vehicle.

"VEC" means vehicle-equivalent credits.

"VED" means vehicle-equivalent debits.

"VMT" means vehicle miles traveled.

"ZEV" means zero-emission vehicle.

<General Materials (GM) - References, Annotations, or Tables>

Note: Authority cited: [Sections 39500, 39600, 39601, 43013, 43018, 43101, 43104, 43105 and 43106, Health and Safety Code](#). Reference: [Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43204 and 43205, Health and Safety Code](#).

## HISTORY

1. New section filed 10-28-99; operative 11-27-99 (Register 99, No. 44).
2. Amendment filed 4-30-2001; operative 5-30-2001 (Register 2001, No. 18).
3. Amendment of subsections (a)(8)(B) and (d) filed 5-24-2002; operative 6-23-2002 (Register 2002, No. 21).
4. Amendment filed 9-16-2002; operative 10-16-2002 (Register 2002, No. 38).
5. Amendment of third paragraph, subsections (a)(4), (a)(8)(A) and (a)(12)(A), new subsection (a)(15), amendment of subsections (b)(3)(B)-(D), new subsection (b)(3)(E) and amendment of subsections (d) and (e) filed 11-4-2003; operative 12-4-2003 (Register 2003, No. 45).
6. Amendment of subsections (a)(8)(B) and (d) filed 2-25-2004; operative 3-26-2004 (Register 2004, No. 9).

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7. Amendment of subsection (d) filed 7-15-2004; operative 8-14-2004 (Register 2004, No. 29).

8. Amendment of subsection (d) and Notefiled 9-15-2005; operative 1-1-2006 (Register 2005, No. 37).

9. Change without regulatory effect amending incorporated document California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles filed 9-15-2005 pursuant to [section 100, title 1, California Code of Regulations](#) (Register 2005, No. 37).

10. Amendment of incorporated document California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and amendment of subsection (d) filed 1-18-2007; operative 2-17-2007 (Register 2007, No. 3).

11. Amendment of subsection (d) and amendment of Note filed 12-5-2007; operative 1-4-2008 (Register 2007, No. 49).

12. Amendment of incorporated document California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and amendment of subsection (d) filed 6-16-2008; operative 6-16-2008 pursuant to [Government Code section 11343.4](#) (Register 2008, No. 25).

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END OF DOCUMENT