State of California
AIR RESOURCES BOARD

**Notice of Public Availability of Modified Text**

2012 AMENDMENTS TO THE CALIFORNIA
ZERO EMISSION VEHICLE REGULATION

Public Hearing Date: January 26 and 27, 2012
Public Availability Date: February 22, 2012
Deadline for Public Comment: March 8, 2012

At its January 26 and 27, 2012 public hearing, the Air Resources Board (ARB or Board) approved staff's proposed amendments with modifications to the California Code of Regulations (CCR), title 13, section 1962.1, 1962.2 (renumbered to 1962.3), and associated test procedures. The Board also approved with modifications the adoption of the new title 13, CCR, section 1962.2, and its new associated test procedures. These regulations relate to the Board's Zero Emission Vehicle (ZEV) program which requires auto manufacturers to develop and commercialize ZEV technologies.

At the hearing, the staff presented, and the Board approved modifications to the regulations originally proposed in the Staff Report released on December 7, 2011 in response to comments received since the Staff Report was published. These modifications include the new optional section 177 state compliance path, the ability for partial allowance zero emission vehicles (PZEV) to certify to LEV II or LEV III exhaust standards in certain model years, and allowing hydrogen internal combustion engine vehicles to earn the full amount of credit under the transitional zero emission vehicle (TZEV) provisions. The Board directed staff to incorporate further modifications including modifying the date by which manufacturers must apply to use the greenhouse gas (GHG) ZEV over-compliance provision and ensuring there is fair treatment for manufacturers transitioning from one size definition category to another.

Board Resolution 12-11 approved new section 1962.2, and the incorporated test procedures, and approved section 1962.1, and the incorporated test procedures and section 1962.2(renumbered to 1962.3) as modified. The resolution and all other regulatory documents for this rulemaking are available online at the following ARB website:

http://www.arb.ca.gov/regact/2012/zev2012/zev2012.htm

In accordance with the Government Code, section 11346.8, the Board directed the Executive Officer to adopt in the CCR, title 13**,** sections 1962.1, 1962.2 and 1962.3, after making them available to the public for comment for a period of at least fifteen days. The Board further provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make such modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if warranted.

## Modified Text Being Made Available for Public Comment

As shown in the 45-Day Public Notice, the existing regulatory language for sections 1962.1 and 1962.2 (renumbered to 1962.3) is denoted by plain text, while additions to the existing regulatory text, as initially proposed, are denoted by single underline and deletions by ~~single strikeout~~. Attachment A contains additional changes to sections 1962.1, 1962.2, and 1962.3 subject to comment with this notice. The proposed regulatory language for the new section 1962.2 is denoted by plain text with no strike out or underline. The additional proposed changes to sections 1962.1 and 1962.2 (renumbered for 1962.3) that are subject to comment in this 15-Day Public Notice are denoted in Attachment A by double underline and deletions by ~~double strikeout~~. The additional proposed changes to the new section 1962.2 that are subject to comment in this 15-Day Public Notice are denoted in Attachment A by single underline and deletions by ~~single strikeout~~. Text for section 1962.1 and 1962.2 (renumbered to 1962.3) in Attachment A that has both single underline and ~~double strikeout~~ is text that staff proposed in the 45-Day Public Notice but later proposed for retraction as part of this 15-Day Public Notice. And text with ~~single strikeout~~ and double underline is text proposed for re-inclusion in sections 1962.1 and 1962.2 (renumbered to 1962.3).

## Summary of Proposed Modifications

### 1. Optional Section 177 State Compliance Path

Staff's modifications include an optional Section 177 state ZEV compliance path available for intermediate and large volume manufacturers. In order to be eligible for this optional compliance path, manufacturers must place additional battery electric vehicles (BEV) in the Section 177 states equal to 0.75 percent of sales in 2016 model year and 1.5 percent of sales in 2017 model year. These obligations cannot be met with "traveled" credits, and are in addition to the existing requirements (i.e. 3 percent in each year) which can be met with "traveled" credits. Existing carry-forward and carry-back provisions will remain available to manufacturers. In exchange for these pre-2018 ZEVs placed in Section 177 states, manufacturers will have the following reductions in their allowed transitional zero emission vehicle (TZEV) percentage and minimum ZEV requirement:

**Optional Compliance Path Section 177 State Allowed TZEV Credit Percentage**

| | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|
| Percentage Reduction for TZEVs | 25% | 20% | 15% | 10% |
| New TZEV Credit % in Section 177 States | 2.25% | 2.40% | 2.55% | 2.25% |

**Optional Compliance Path Section 177 State Minimum ZEV Credit Percentage**

| | 2018 | 2019 | 2020 |
|---|---|---|---|
| Percent Reductions for Minimum ZEV Floor | 37.5% | 25% | 12.5% |
| New minimum ZEV Credit % in Section 177 States | 1.25% | 3% | 5.25% |

In addition to the above credit percentage reductions, manufacturers on this optional compliance path will be allowed to "pool" their TZEV and ZEV credits within two regional pools: an East Region pool and a West Region pool. The East Region pool will be defined as Section 177 states east of the Mississippi River. The West Region pool will be defined as the Section 177 states located west of the Mississippi River. Currently, the East Region includes the following states: Connecticut, Maine, Maryland, Massachusetts, Rhode Island, New Jersey, New York, and Vermont. The West Region currently includes the following states: New Mexico and Oregon. Pooling for TZEV credits shall begin in 2015 model year through 2021 model year, and pooling for ZEV credits shall begin in 2016 model year through 2021 model year. Trading between the East and West pools is allowed at a 30% premium. For example, a manufacturer wanting to trade from its East to West pool would take 130 credits from its East pool, and move those credits to its West pool, where the traded credits would be worth 100 credits in its West pool. Intermediate or large volume manufacturers must submit written notification for choosing this path no later than September 1, 2014. Pooling will be assessed on whether the system is working as intended and considered for model years beyond 2021 at a later review of the ZEV regulation. Regulatory language has been added to subdivisions 1962.1(d)(5)(E)3. (and in the incorporated test procedures) and 1962.2(d)(5)(E)3. (and in the incorporated test procedures) to reflect this optional compliance path.

All parties reserve the right to reevaluate this proposal and/or any subsequent agreement in the event of other significant changes to California's proposed regulation, including changes to California volume requirements. Any changes would need to go through a subsequent rulemaking.

## 2. GHG-ZEV Over-Compliance

The Board directed staff to pull forward the final application date for manufacturers choosing to use the GHG-ZEV over-compliance provision from May 1, 2018 to December 31, 2016. This will allow staff to consider information on manufacturers' plans to over-comply with the GHG fleet standard in the mid-term review, scheduled to take place in 2017.

Additionally, as provided in "Attachment E" which was made available at the Board Hearing, staff's modifications include a provision which states that the GHG-ZEV over-compliance provision is only available if the Board accepts compliance with the Federal GHG fleet standard as compliance with the California GHG fleet standard.

### 3. PZEV Certification

Staff's modifications include allowing manufacturers to certify 2014 model year PZEVs to the new LEV III standards, which includes super-ultra-low-emission vehicle (SULEV) 20 certification. This modification reflects what is proposed to be allowed under the LEV III regulation. Additionally, staff's modifications allow 2015 through 2019 vehicles (PZEVs, advanced technology PZEVs, and TZEVs) to certify to LEV II exhaust and evaporative emission standards to conform to what is proposed to be allowed under the LEV III regulation.

### 4. Same Year Method for Calculating the Number of Vehicles to Which the Percentage ZEV requirement is Applied

Staff's changes modify the criteria by which the Executive Officer is to make a decision allowing a manufacturer to use the same year method, as opposed to the previous second, third, and fourth model year average, to when a manufacturer experiences a 30 percent drop in sales rather than 40 percent drop in sales. Staff analyzed manufacturers' sales data from periods in which there were significant drops in vehicle sales.

Based on this analysis, staff considers a 30 percent decline from one model year to the next represents a significant impact to a manufacturer, and is an appropriate threshold for allowing a manufacturer to choose the same year method to determine its ZEV requirements.

### 5. TZEV Credit Calculation for 2018 and Subsequent Model Years

It has been brought to staff's attention that the use of actual charge depleting range ($R_{cda}$) for TZEV credit determination might be "gamed" with vehicles equipped with battery systems that may not maintain sufficient power output through several urban dynamometer drive schedule (UDDS) driving cycles to meet the acceleration requirements on electric power alone, and that equivalent all electric range (EAER) would better reflect usable battery capacity. Without the proposed change, blended plug-in hybrid electric vehicles (PHEV) would earn the same credit as ones that could maintain higher power throughout a UDDS range test, where test results would show EAER equal to $R_{cda}$. The proposed change bases credit on EAER instead of $R_{cda}$. This modification will not result in a change in credit for most PHEVs, and will allocate credit proportional to the amount of usable energy available on a particular PHEV, a more appropriate metric for PHEV performance in the ZEV regulation.

### 6. Definition Changes

At the January 2012 hearing, the Board directed staff to resolve remaining inconsistencies regarding the timing when manufacturers are subject to the large volume and intermediate volume ZEV requirements as a result of changing size definition categories for any reason, including change of ownership situations. Staff modified regulatory language in section 1962.1, and in the incorporated test procedure, to ensure manufacturers changing size due to change of ownership would be subject to stepped-up requirements starting in 2018.

**7. Delivered for Sale and Placed in Service**

Staff's modifications allow manufacturers to earn both delivered for sale and placed in service credits for a ZEV, as long as the ZEV is delivered for sale in either California or a Section 177 state, and placed in service in California or a Section 177 state. Frequently, especially amongst Section177 states in the Northeast, dealers trade vehicles across state lines, and manufacturers have little control over where the vehicles are placed in service. Additionally, staff's modifications specify that the total credit for the vehicle (meaning the delivered for sale credit plus the placed in service credit) will be earned in the state in which the ZEV is originally delivered for sale.

**8. Hydrogen Internal Combustion Engine Vehicles**

Staff's modifications include adding back subdivision 1962.1(c)(3)(B) and subdivision C.3.3(b), which allows hydrogen internal combustion engine vehicles to qualify for zero-emission vehicle miles traveled (VMT) PZEV allowance. Manufacturers have indicated interest in hydrogen internal combustion engine vehicles, and those vehicles will continue to qualify as TZEVs in 2012 and subsequent model years.

**9. Alternative Charge Connector**

Staff's modifications include an alternative approval process in Section 1962.3 for vehicles with SAE J1772 AC "equivalency" when equipped with a manufacturer provided, safety-listed adapter. This provides flexibility for manufacturers as a DC fast charge connector standard is being developed and adopted.

**10. Upstream Emissions and Harmonizing with Federal Regulations**

The Board directed staff to have manufacturers include upstream emission associated with ZEVs and TZEVs in their calculation of GHG-ZEV over compliance credits in 2018 through 2021 model year. When staff subsequently updates the regulation to harmonize with the Federal standard, it will make appropriate changes to the regulatory language to ensure upstream emissions associated with ZEVs and TZEVs are included in a manufacturer's calculation of GHG-ZEV over compliance credits.

**11. Minor Modifications**

Other post-hearing conforming modifications were made to the regulation for clarification and simplification:

Minor modifications for Section 1962.1 and the incorporated Test Procedure

1962.1(b)(1)(B)2. and C.2.1(b)(2): References to light-duty truck "2" (LDT2) have been removed from this section because the phase in of LDT2s in manufacturer's applicable sales volumes will be completed after model year 2011.

1962.1(c)(3)(A) and C.3.3(a): References to the "California Exhaust Emission Standards and Test Procedures through 2017 Model Zero-Emission Vehicles, and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium Duty Vehicle Classes" have been updated, as well as the reference to the equation used to determine the utility factor manufacturers are to use to calculate a zero-emission VMT allowance.

1962.1(d)(5)(E)1. and 2., and C.4.5(e)(1) and (2): Regulatory language has been clarified to specifically apply the provision to large volume manufacturers and intermediate volume manufacturers, which are the only manufacturers with a ZEV requirement. Additionally, language in subdivisions 1962.1(d)(5)(E)1.b. and C.4.5(e)(1)(B) has been clarified to match the regulatory language in subdivisions 1962.1(d)(5)(E)1.a. and C.4.5(e)(1)(A).

1962.1(g)(2)(A) and C.7.2(a): Regulatory language has been clarified to accurately reflect how ZEV credits are calculated. Additionally, language has been added to specify how credits are calculated for model years 2015 through 2017.

1962.1(g)(2)(B) and C.7.2(b): Regulatory language has been clarified to accurately reflect how PZEV credits are calculated. Additionally, language has been added to specify how credits are calculated for model years 2015 through 2017.

1962.1(g)(2)(A) and (B), and C.7.2(a) and (b): Regulatory language has also been clarified to reflect that manufacturers may use the light-duty truck "2" (LDT2) non-methane organic gas (NMOG) fleet average when calculating the amount of credits earned by LDT2 PZEVs and ZEVs in model year 2009 through 2011. For 2012 through 2014 model years, manufacturer are only allowed to use their passenger car (PC) and light-duty truck "1" (LDT1) NMOG average when calculating PZEV and ZEV credits.

1962.1(g)(5)(A) and C.7.5(a): Regulatory language has been clarified to specify that transportation system credits for 2009 through 2011 ZEVs can qualify for the travel provision. The language has been also been corrected to show that TZEVs, Type I.5x vehicles and Type IIx vehicles can earn transportation system credits through model year 2017.

1962.1(g)(5)(C)2. and C.7.5(c)(2): The language has been clarified to specify how the cap for transportation system credits earned by TZEVs applies if a manufacturer chooses to comply with the optional Section 177 state compliance path.

1962.1(g)(6)(A) and C.7.6(a): The language has been clarified to specify how the cap for both 2001 through 2005 neighborhood electric vehicles (NEV) and 2006 and through 2017 NEVs applies if a manufacturer chooses to comply with the optional Section 177 state compliance path.

1962.1(i)(5) and B.1: A definition for “conventional rounding method” has been added to clarify how credits are rounded in the ZEV bank and when doing ZEV calculations.

1962.1(i)(6) and B.1: A definition for “East Region pool” has been added due to the new optional Section 177 state compliance path.

1962.1(i)(7) through (18): These subdivisions have been renumbered due to the addition of new definitions.

1962.1(i)(17) and B.1: A definition for “West Region pool” has been added due to the new optional Section 177 state compliance path.

Section D.3: A sentence was added to Section D in the 2009 through 2017 incorporated test procedures in staff’s initial proposal, but was not properly underlined. The new sentence, which requires manufacturers to update their annual NMOG reports if their production numbers on their ZEV reports have been updated, has been indicated by a double underline.

Section F: The Section F title in the 2009 through 2017 incorporated test procedure has been modified to reflect that section F applies to 2012 through 2017 model ZEVs and hybrid electric vehicles. Additionally, a reference has been corrected in the first paragraph of this section due to renumbering of test procedure sections.

Section G: The Section G title in the 2009 through 2017 incorporated test procedures has been modified to reflect that Section G applies to 2012 through 2017 model off-vehicle charge capable hybrid electric vehicles (PHEVs). Additionally a new section G.12 has been added to establish the calculations that must be used to determine the GHG emissions values attributable to PHEVs for the 2017 model year.

<u>Minor Modifications for 1962.2 and the Incorporated Test Procedures</u>

1962.2(a) and C.1: The language has been clarified to reflect that greenhouse gas emissions from a vehicle’s air conditioning system will not exclude the vehicle from counting as a ZEV.

1962.2(c)(3)(A)1. and C.3.3(a)(1): The language has been corrected with the appropriate acronym for all electric range, which is AER, not $R_{cda}$. Additionally, the reference to the “California Exhaust Emission Standards and Test Procedures for the 2018 and Subsequent Model Zero-Emission Vehicles, and Hybrid Electric Vehicles in the Passenger Car, Light-Duty Truck, and Medium Duty Vehicle Classes” has been corrected.

1962.2(d)(5)(E) and C.4.5(e): The language has been clarified to specifically apply the provision to large volume manufacturers and intermediate volume manufacturers, which are the only manufacturers with a ZEV requirement.

1962.2(d)(5)(G) and C.4.5(g): The minimum range qualification has been corrected from 80 miles range to 75 miles range for range extended battery electric vehicles (BEVx) to match the minimum requirements for BEVxs in 2012 through 2017.

1962.2(g)(2)(A) and C.7.2(a): The language has been clarified for how ZEV credits are calculated if a manufacturer chooses to comply with the optional Section 177 state compliance path.

1962.2(g)(2)(B) and C.7.2(b): The language has been clarified for how TZEV credits are calculated if a manufacturer chooses to comply with the optional Section 177 state compliance path.

1962.2(g)(5)(C)1 and C.7.5(c)(1): The language has been clarified to specify how the cap for transportation system credits earned by ZEVs applies if a manufacturer chooses to comply with the optional Section 177 state compliance path.

1962.2(g)(5)(C)2 and C.7.5(c)(2): The language has been clarified to specify how the cap for transportation system credits earned by TZEVs applies if a manufacturer chooses to comply with the optional Section 177 state compliance path.

1962.2(g)(6)(A) and C.7.6(a): The language has been clarified to specify how the cap for discounted PZEV and AT PZEV credits and NEV credits applies if a manufacturer chooses to comply with the optional Section 177 state compliance path.

1962.2(g)(6)(B)2.a and C.7.6(b)(2)A.: The language has been corrected to reference the correct subdivision within section 1961.3.

1962.2(i)(3) and B.1.: A definition for “conventional rounding method” has been added to clarify how credits are rounded in the ZEV bank and when doing ZEV calculations.

1962.2(i)(5) and B.1.: A definition for “East Region pool” has been added due to the new optional Section 177 state compliance path.

1962.2(i)(4) – (19): These subdivisions have been renumbered due to the addition of new definitions.

1962.2(i)(17) and B.1.: A definition for “West Region pool” has been added due to the new optional Section 177 state compliance path.

1962.2(j): Some abbreviations have been removed because they no longer apply nor are used in the regulatory text.

Section B.1: Definitions for Discounted PZEVs and AT PZEV credits, energy storage device, hydrogen fuel cell vehicle, and hydrogen internal combustion engine vehicle have been added to the 2018 and subsequent model year test procedures to reflect definitions included in section 1962.2.

Section F: The Section F title has been modified in the 2018 and subsequent model year incorporated test procedures to reflect that section F applies to 2018 and subsequent model ZEVs and hybrid electric vehicles. Additionally, a sentence has been removed that stated manufacturers may certify 2009 through 2011 model year ZEVs and hybrid electric vehicles because the sentence will not apply in the 2018 and subsequent model year timeframe.

Section G: The Section G title has been modified in the 2018 and subsequent model year incorporated test procedures to reflect that section G applies to 2018 and subsequent model ZEVs and hybrid electric vehicles. Additionally, a sentence has been removed that stated manufacturers may certify 2009 through 2011 model year PHEVs because the sentence will not apply in the 2018 and subsequent model year timeframe.

Section J: Section J has been deleted from the 2018 and subsequent model year incorporated test procedures because it the 2009 through 2011 test procedures for 2009 through 2011 model ZEV and hybrid electric vehicles no longer applies.

In addition to the modifications described above, various modifications to the regulatory text have been made to improve clarity.

Written comments will only be accepted on the modifications identified in this notice and may be submitted by postal mail or electronic mail submittal as follows:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

Please note that under the California Public Records Act (Gov. Code §6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

In order to be considered by the Executive Officer, comments must be directed to ARB in one of the two forms described above and received by ARB by 5:00 p.m., on the deadline date for public comment listed at the beginning of this notice. Only comments relating to the above-described modifications to the text of the regulations shall be considered by the Executive Officer.

If you need this document in an alternate format or another language, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 no later than five (5) business days from the release date of this notice. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Si necesita este documento en un formato alterno u otro idioma, por favor llame a la oficina del Secretario del Consejo de Recursos Atmosféricos al (916) 322-5594 o envíe un fax al (916) 322-3928 no menos de cinco (5) días laborales a partir de la fecha del lanzamiento de este aviso. Para el Servicio Telefónico de California para Personas con Problemas Auditivos, ó de teléfonos TDD pueden marcar al 711.

Attachments

*The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see ARB's website at www.arb.ca.gov.*

**Attachment A**

California Environmental Protection Agency
AIR RESOURCES BOARD

# PROPOSED 15-DAY REGULATION ORDER

## California Code of Regulations
## Section 1962.1
## Section 1962.2
## Section 1962.3 (Renumbered from 1962.2)



Date of Release: December 7, 2011
Date of Board Hearing: January 26-27, 2012
Date of 15 day notice period: February 23, 2012

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## Attachment A

## PROPOSED 15-DAY MODIFIED REGULATION ORDER

Amend section 1962.1, title 13, California Code of Regulation (CCR), to read as follows:

[Note: Set forth below are the 2012 amendments to the California zero emission vehicle (ZEV) regulation. The 45-day originally noticed text amendments are shown underline to indicate additions and ~~strikeout~~ to indicate deletions, compared to the preexisting regulatory language. The 15-day modifications subject to comment are shown in double underline to indicate additions and ~~double strikeout~~ to show deletions. Text that has both single underline and ~~double strikeout~~ is additional text that staff proposed during the 45-day Public Notice period but proposed for retraction as part of this 15-day Public Notice period. Text with ~~single strikeout~~ and double underline is text being proposed for re-inclusion in the regulation. All other portions remain unchanged and are indicated by the symbol "* * * * *" for reference.]

**§ 1962.1 Zero-Emission Vehicle Standards for 2009 ~~and Subsequent~~through 2017 Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.**

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**(b)** ***Percentage ZEV Requirements.***

**(1)** ***General Percentage ZEV Requirement.***

* * * * *

**(B)** ***Calculating the Number of Vehicles to Which the Percentage ZEV Requirement is Applied.*** For purposes of calculating a manufacturer's requirement in subdivision 1962.1(b)(1) for model years 2009 through 2017, a manufacturer may use a three year average method or same model year method, as described below in sections 1. and 2. A manufacturer may switch methods on an annual basis. This production averaging is used to determine ZEV requirements specified in subdivision 1962.1 (b)(1)(A) only, and has no effect on a manufacturer's size determination, specified in section 1900. In applying the ZEV requirement, a PC, LDT1, or LDT2, that is produced by one manufacturer (e.g., Manufacturer A), but is marketed in California by another manufacturer (e.g., Manufacturer B) under the other manufacturer's (Manufacturer B) nameplate, shall be treated as having been produced by the marketing manufacturer (Manufacturer B).

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2. For 2012 ~~and subsequent~~through 2017 model years, a manufacturer's production volume for the given model year will be based on the three-year average of the manufacturer's volume of PCs and LDT~~1~~s, ~~and LDT2s, as applicable,~~ produced and delivered for sale in California in the prior fourth, fifth and sixth model year (for example, 2013 model year ZEV requirements will be based on California production volume of PCs and LDT~~1~~s, ~~and LDT2s as applicable,~~ for the 2007 to 2009 model years, and 2014 model year ZEV requirements will be based on California production volume of PCs and LDTs, for the 2008 to 2010 model years). ~~This production averaging is used to determine ZEV requirements only, and has no effect on a manufacturer's size determination.~~ As an alternative to the three-year averaging of prior year production described above, a manufacturer may elect to base its ZEV obligation on the number of PCs and LDT~~1~~s, ~~and LDT2s, as applicable,~~ produced by the manufacturer and delivered for sale in California that same model year. ~~For 2012 and subsequent model years, a~~ A manufacturer may, on an annual basis, select either ~~the three-year average or the same model year calculation method. In applying the ZEV requirement, a PC, LDT1, or LDT2 as applicable, that is produced by one manufacturer (e.g., Manufacturer A), but is marketed in California by another manufacturer (e.g., Manufacturer B) under the other manufacturer's (Manufacturer B) nameplate, shall be treated as having been produced by the marketing manufacturer (Manufacturer B).~~

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**(7) *Changes in Small Volume, Independent Low Volume, and Intermediate Volume Manufacturer Status.***

**(A) *Increases in California Production Volume.*** In 2009 ~~and subsequent~~ through 2017 model years, if a small volume manufacturer's average California production volume exceeds 4,500 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, or if an independent low volume manufacturer's average California production volume exceeds 10,000 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, the manufacturer shall no longer be treated as a small volume, or independent low volume manufacturer, as applicable, and shall comply with the ZEV requirements for intermediate volume manufacturers, as applicable, beginning with the sixth model year after the last of the three consecutive model years.

If an intermediate volume manufacturer's average California production volume exceeds 60,000 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years (i.e., total production volume exceeds 180,000 vehicles in a three-year period), the manufacturer shall no longer be treated as an intermediate volume manufacturer and shall, beginning with the sixth model year after the last of the three

consecutive model-years, or in model year 2018 (whichever occurs first), comply with all ZEV requirements for LVMs.

~~Requirements will begin in the fourth model year, or in model year 2018 (whichever occurs first) rather than the sixth model year when a manufacturer ceases to be a small or intermediate~~ independent low ~~volume manufacturer in 2003 or subsequent years due to the aggregation requirements in majority ownership situations, except that if the majority ownership in the manufacturer was acquired prior to the 2001 model year, the manufacturer must comply with the stepped-up ZEV requirements starting in the 2010 model year.~~ Requirements will begin in the ~~fourth~~ sixth model year, or in model year 2018 (whichever occurs first) ~~rather than the sixth model year~~ when a manufacturer ceases to be an intermediate volume manufacturer in 2003 ~~or subsequent years~~through 2017 due to the aggregation requirements in majority ownership situation.

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**(c)** ***Partial ZEV Allowance Vehicles (PZEVs)*****.**

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**(2)** ***Baseline PZEV Allowance*****.** In order for a vehicle to be eligible to receive a PZEV allowance, the manufacturer must demonstrate compliance with all of the following requirements. A qualifying vehicle will receive a baseline PZEV allowance of 0.2.

**(A)** ***SULEV Standards.*** For 2009 through 2014~~4~~3 model years, ~~C~~certify the vehicle to the 150,000-mile SULEV exhaust emission standards for PCs and LDTs in ~~section~~subdivision 1961(a)(1). Bi-fuel, fuel-flexible and dual-fuel vehicles must certify to the applicable 150,000-mile SULEV exhaust emission standards when operating on both fuels. For 201~~5~~4 through 2017 model years, certify the vehicle to the 150,000-mile SULEV 20 or 30 exhaust emission standards for PCs and LDTs in subdivision 1961.2(a)(1), or to the 150,000-mile SULEV exhaust emission standards for PCs and LDTs in subdivision 1961(a)(1). Bi-fuel, fuel flexible and dual-fuel vehicles must certify to the applicable 150,000-mile SULEV ~~20 or 30~~ exhaust emission standards when operating on both fuels;

**(B)** ***Evaporative Emissions.*** For 2009 through 2014~~3~~3 model years, ~~C~~certify the vehicle to the evaporative emission standards in ~~section~~subdivision 1976(b)(1)(E) (zero-fuel evaporative emissions standards). For 201~~5~~4 through 2017 model years, certify the vehicle to the evaporative emission standards in subdivision 1976(b)(1)(G) or subdivision 1976(b)(1)(E);

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**(3)** ***Zero-Emission VMT PZEV Allowance*****.**



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**(A)** ***Calculation of Zero--Emission VMT Allowance.*** A vehicle that meets the requirements of ~~section~~subdivision 1962.1(c)(2) and has zero-emission vehicle miles traveled ("VMT") capability will generate an additional zero-emission VMT PZEV allowance calculated as follows:

| *Range* | *Zero-emission VMT Allowance* |
|---|---|
| $EAER_u$ < 10 miles | 0.0 |
| $EAER_u$ ≥10 ~~miles~~ to 40 miles ~~and~~ ~~$R_{cda}$ = 10 miles to 40 miles~~ | $EAER_u$ x (1 – $UF_{Rcda}$)/11.028 |
| ~~$R_{cda}$~~ $EAER_u$ > 40 miles | ~~$EAER_{u40}$/ 29.63~~ $(EAER_{u40})$ x [1 – ($UF_{40}$*$R_{cda}$/$EAER_u$)]/ 11.028 Where, $UF_{40}$= utility factor at 40 miles $EAER_{u40}$= 40 miles |

A vehicle cannot generate more than 1.39 zero-emission VMT PZEV allowances.

The urban equivalent all-electric range ($EAER_u$) and urban charge depletion range actual ($R_{cda}$) shall be determined in accordance with section ~~F.12~~G.5.4 and ~~F.5.5~~G.11.9, respectively, of the "California Exhaust Emission Standards and Test Procedures for 2009 ~~and Subsequent~~through 2017 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 1962.1(h). The utility factor (UF) based on the charge depletion range actual (urban cycle) ($R_{cda}$) shall be determined according to Section 4.5.2 Equation ~~5~~6 and the "Fleet UF" Utility Factor Equation Coefficients in Section 4.5.2, Table 3 of SAE J2841 March 2009.

~~**(B)** ***Alternative Procedures.*** As an alternative to determining the zero-emission VMT allowance in accordance with the preceding section 1962.1(c)(3)(A), a manufacturer may submit for Executive Officer approval an alternative procedure for determining the zero-emission VMT potential of the vehicle as a percent of total VMT, along with an engineering evaluation that adequately substantiates the zero-emission VMT determination. For example, an alternative procedure may provide that a vehicle with zero-emissions of one regulated pollutant (e.g., NOx) and not another (e.g., NMOG) will qualify for a zero-emission VMT allowance of 1.5.~~

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**(C)** ***~~ZEV~~ Credits for 2009 ~~and Subsequent~~through 2017 Model Year ZEVs.*** A 2009 ~~and subsequent~~through 2017 model-year ZEV, including a Type I.5x and Type IIx, other than a NEV or Type 0, earns 1 ZEV credit when it is produced and delivered for sale in California. A 2009 ~~and subsequent~~through 2017 model-year ZEV earns additional credits based on the earliest year in which the ZEV is placed in service in California (not earlier than the ZEV's model year). The vehicle must be delivered for sale and placed in service in ~~the same state (i.e California)~~a Section 177 state or in California in order to earn the total credit amount. The total credit amount will be earned in the state (i.e. California or a Section 177 state) in which the vehicle was delivered for sale. The following table identifies the total credits that a ZEV in each of the eight ZEV tiers will earn, including the credit not contingent on placement in service, if it is placed in service in the specified calendar year or by June 30 after the end of the specified calendar year. A vehicle is not eligible to receive credits if it is placed in service after December 31, five calendar years after the model year. For example, if a vehicle is produced in 2012, but does not get placed until January 1, 2018, the vehicle would no longer be eligible for ZEV credits.

* * * * *

**(E)** ***Counting Specified ZEVs Placed in a Section 177 State and in California.***

**1.** ***Provisions for 2009 Model Year.***

**a**. ~~Manufacturers with a ZEV requirement producing~~ Large volume manufacturers and intermediate volume manufacturers with credits earned from ZEVs, excluding NEVs and Type 0 ZEVs, that are either certified to the California ZEV standards or approved as part of an advanced technology demonstration program and are placed in service in a Section 177 state, may be counted towards compliance with the California percentage ZEV requirements in ~~section~~subdivision 1962.1(b), including the requirements in ~~section~~subdivision 1962.1(b)(2)(B), as if they were delivered for sale and placed in service in California.

**b.** ~~Manufacturers with a ZEV requirement producing~~ Large volume manufacturers and intermediate volume manufacturers with credits earned from ZEVs, excluding NEVs and Type 0 ZEVs, that are either certified to the California ZEV standards or approved as part of an advanced technology demonstration program and are placed in service in California may be counted towards compliance with the percentage ZEV requirements of ~~any~~all Section 177 states, including requirements based on ~~section~~subdivision 1962.1(b)(2)(B).

**2**. ***Provisions for 2010 through 2017 Model Years.***

~~Manufacturers with a ZEV requirement producing Specified model year~~ Large volume manufacturers and intermediate volume manufacturers with credits earned from ZEVs, including Type I.5x and Type IIx vehicles, and excluding NEVs and Type 0 ZEVs, that are either certified to the California ZEV standards applicable for the ZEV's model year or approved as part of an advanced technology demonstration program and are placed in service in California or in a Section 177 state may be counted towards compliance in California and in all Section 177 states, with the percentage ZEV requirements in ~~section~~subdivision 1962.1(b), provided that the credits are multiplied by the ratio of a~~n~~

~~LVM's~~ manufacturer's applicable production volume for a model year, as specified in ~~section~~subdivision 1962.1(b)(1)(B), in the state receiving credit to the ~~LVM's~~manufacturer's applicable production volume (hereafter, "proportional value"), as specified in section 1962.1(b)(1)(B), for the same model year in California. Credits generated in a Section 177 state will be earned at the proportional value in the Section 177 state, and earned in California at the full value specified in ~~section~~subdivision 1962.1(d)(5)(C). However, credits generated by 2010 and 2011 model-year vehicles produced, delivered for sale, and placed in service or as part of an advanced technology demonstration program in California to meet ~~the~~ any Section 177 state's requirements that implement ~~section~~subdivision 1962.1(b)(2)(B) are exempt from proportional value, with the number of credits exempted from proportional value allowed being limited to the number of credits needed to satisfy a manufacturer's Section 177 state's requirements that implement ~~section~~subdivision 1962.1(b)(2)(B)1.b. The table below specifies the qualifying model years for each ZEV type that may be counted towards compliance in all Section 177 states.

| ***Vehicle Type*** | ***Model Years:*** |
|---|---|
| Type I, I.5, or II ZEV | 2009 – ~~2014~~2017 |
| Type III, IV, or V ZEV | 2009 – 2017 |
| Type I.5x or Type IIx | 2012 – 2017 |

**3. *Optional Section 177 State Compliance Path.*** Large volume manufacturers and intermediate volume manufacturers that choose to elect the optional section 177 state compliance path must notify the Executive Officer and each section 177 state in writing no later than September 1, 2014.

**a. *Additional 2016 and 2017 Model Year ZEV Requirements.*** Large volume manufacturers and intermediate volume manufacturers that elect the optional section 177 state compliance path must generate additional 2012 through 2017 model year ZEV credits, including no more than 50% Type 1.5x and Type IIx vehicle credits and excluding all NEV and Type 0 ZEV credits, in each section 177 state equal to the following percentages of their sales volume determined under subdivision 1962.1(b)(1)(B):

| Model Years | Additional Section 177 State ZEV Requirements |
|---|---|
| 2016 | 0.75% |
| 2017 | 1.50% |



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Subdivision 1962.1(d)(5)(E)2. shall not apply to any ZEV credits used to meet a manufacturer's additional 2016 and 2017 model year ZEV requirements under this subdivision 1962.1(d)(5)(E)3.a. ZEVs produced to meet a manufacturer's additional 2016 and 2017 model year ZEV requirements under this subdivision 1962.1(d)(5)(E)3.a. must be placed in service in the section 177 states no later than June 30, 2018.

**i. Trading and Transferring ZEV Credits within the West Region Pool and East Region Pool.** Manufacturers may trade or transfer specified model year ZEV credits, used to meet the same model year requirements in subdivision 1962.1(d)(5)(E)3.c, within the West Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 model year shortfall of 100 credits in State X, the manufacturer may transfer 100 (2016 model year) ZEV credits from State Y, within the West Region pool. Manufacturers may trade or transfer specific model year ZEV credits, used to meet the same model year requirements in subdivision 1962.1(d)(5)(E)3.c., within the East Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 model year shortfall of 100 credits in State W, the manufacturer may transfer 100 (2016 model year) ZEV credits from State Z, within the East Region pool.

**ii. Trading and Transferring ZEV Credits between the West Region Pool and East Region Pool**. Manufacturers may trade or transfer specified model year ZEV credits used to meet the same model year requirements in subdivision 1962.1(d)(5)(E)3.c. between the West Region pool and the East Region pool; however, any credits traded or transferred will incur a premium of 30% of their value. For example, in order for a manufacturer to make up a 2016 model year shortfall of 100 credits in the West Region Pool, the manufacturer may transfer 130 (2016 model year) ZEV credits from the East Region Pool. No credits may be traded or transferred to the East Region pool or West Region pool from a manufacturer's California ZEV bank, or from the East Region pool or West Region pool to a manufacturer's California ZEV bank.

**b. *Reduced TZEV Percentages.*** Large volume manufacturers and intermediate volume manufacturers that elect the optional section 177 state compliance path and that fully comply with the additional 2016 and 2017 model year ZEV requirements in this subdivision 1962.1(d)(5)(E)3.a. are allowed to meet TZEV percentages reduced from the allowed TZEV percentages in subdivision 1962.1(b)(2)(D)2. and 3. in 2015 through 2017 model year in each section 177 state as enumerated below:

| Model Year | 2015 | 2016 | 2017 |
|---|---|---|---|
| Existing TZEV Percentage | 3.00% | 3.00% | 3.00% |
| Section 177 State Adjustment for Optional Compliance Path for TZEVs | 75.00% | 80.00% | 85.00% |
| New Section 177 State Optional Compliance Path TZEV Percentage | 2.25% | 2.40% | 2.55% |

Manufacturers may meet the reduced TZEV percentages above with credits from ZEVs or credits from TZEVs. These reduced TZEV percentages also reduce the total ZEV percent requirement, as illustrated in subdivision 1962.1(d)(5)(E)3.c.

**i. Trading and Transferring TZEV Credits within the West Region Pool and the East Region Pool.** Manufacturers may trade or transfer specified TZEV credits used to meet the same model year subdivision 1962.1(d)(5)(E)3.c. requirements within the West Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 shortfall of 100 credits in State X, the manufacturer may transfer 100 (2016 model year) TZEV credits from State Y, within the West Region pool. Manufacturers may trade or transfer TZEV credits to meet the same model year subdivision 1962.1(d)(5)(E)3.c. within the East Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 model year shortfall of 100 credits in State W, the manufacturer may transfer 100 (2016 model year) TZEV credits from State Z, within the East Region pool.

**ii. Trading and Transferring TZEV Credits between the West Region Pool and the East Region Pool**. Manufacturers may trade or transfer specified TZEV credits used to meet the same model year percentages in subdivision 1962.1(d)(5)(E)3.c. between the West Region pool and the East Region pool; however, any credits traded or transferred will incur a premium of 30% of their value. For example, in order for a manufacturer to make up a 2016 model year shortfall of 100 credits in the West Region Pool, the manufacturer may transfer 130 (2016 model year) TZEV credits from the East Region Pool. No credits may be traded or transferred to the East Region pool or West Region pool from a manufacturer's California ZEV bank, or from the East Region pool or West Region pool to a manufacturer's California ZEV bank.

**c. *Total Requirement Percentages.*** Requirements for the minimum ZEV floor, and allowed percentages for AT PZEVs and PZEVs in subdivision 1962.1(b) remain in effect for large and intermediate volume manufacturers choosing the optional section 177 state compliance path in each section 177 state. However, the optional section 177 compliance path requires manufacturers to meet additional ZEV requirements and allows manufacturers to meet reduced TZEV percentages as described above in subdivision 1962.1(d)(5)(E)3.a. and b. The table below enumerates the total annual percentage obligation in each section 177 state for the 2015 through 2017 model years if the manufacturer elects the optional section 177 state compliance path and produces the minimum number of credits required to meet its minimum ZEV floor and the maximum percentage allowed to be met with credits from TZEVs, AT PZEVs and PZEVs.

| Years | Total ZEV Percent Requirement for Optional Compliance Path | Minimum ZEV Floor for Optional Compliance Path | TZEVs for Optional Compliance Path | AT PZEVs (no change) | PZEVs (no change) |
|---|---|---|---|---|---|
| 2015 | 13.25% | 3.00% | 2.25% | 2.00% | 6.00% |
| 2016 | 14.15% | 3.75% | 2.40% | 2.00% | 6.00% |
| 2017 | 15.05% | 4.50% | 2.55% | 2.00% | 6.00% |

**d. *Reporting Requirements.*** On an annual basis, by May 1st of the calendar year following the close of a model year, each manufacturer that elects the optional section 177 state compliance path shall submit, in writing, to the Executive Officer and each section 177 state a report, including an itemized list, that demonstrates the manufacturer has met the requirements of this subdivision 1962.1(d)(5)(E)3. in each section 177 state as well as in the East Region pool and in the West Region pool. The itemized list shall include the following:

i. The manufacturer's total applicable volume of PCs and LDTs delivered for sale in each section 177 state within the pool, as determined under subdivision 1962.1(b)(1)(B).

ii. Make, model, vehicle identification number, credit earned, and section 177 state where delivery for sale and placement in service for ZEV occurred to meet the manufacturer's additional ZEV obligation under subdivision 1962.1(d)(5)(E)3.a.

iii. Make, model, vehicle identification number, credit earned, and section 177 state where delivery for sale of each TZEV occurred and section 177 state where delivery for sale and placement in



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service of each ZEV occurred to meet manufacturer's requirements under subdivision 1962.1(d)(5)(E)3.c.

**e. *Failure to Meet Optional Section 177 State Compliance Path Requirements.*** A manufacturer that elects the optional section 177 state compliance path and does not meet the requirements in subdivision 1962.1(d)(5)(E)3.a. by June 30, 2018 in all section 177 states within an applicable pool shall be treated as subject to the total ZEV percentage requirements in section 1962.1(b) for the 2015 through 2017 model years in each section 177 state and the pooling provisions in subdivision 1962.1(d)(5)(E)3.a. shall not apply. Any transfers of ZEV credits between section 177 states will be null and void, and ZEV credits will return to the section 177 state in which the credits were earned. A manufacturer that elects the optional section 177 state compliance path and does not meet the percentages in subdivision 1962.1(d)(5)(E)3.b. in a model year or make up their deficit within the specified time and with the specified credits allowed by subdivision 1962.1(g)(7)(A) in all section 177 states within an applicable pool shall be treated as subject to the total ZEV percentage requirements in section 1962.1(b) for the 2015 through 2017 model years and the pooling provisions in subdivision 1962.1(d)(5)(E)3.b. shall not apply. Any transfers of TZEV credits between section 177 states will be null and void if a manufacturer fails to comply, and TZEV credits will return to the section 177 state in which the credits were earned. Penalties shall be calculated separately by each section 177 state where a manufacturer fails to make up the ZEV deficits by the end of the 2018 model year.

**f.** The provisions in section 1962.1 shall apply to a manufacturer electing the optional section 177 state compliance path, except as specifically modified by this subdivision 1962.1(d)(5)(E)3.

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**(g) *Generation and Use of ~~ZEV~~ Credits; Calculation of Penalties***

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**(2) *~~ZEV~~ Credit Calculations.***

**(A) *Credits from ZEVs.*** For model years 2009 through 2014, ~~T~~the amount of g/mi ~~ZEV~~ credits earned by a manufacturer in a given model year from ZEVs shall be expressed in units of g/mi NMOG, and shall be equal to the number of credits from ZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements for the model year subtracted from the number of ZEV credits produced and delivered for sale in California by the manufacturer in the model year or model years and then multiplied by the NMOG fleet average requirement for PCs and LDT1s~~, or LDT2s as applicable,~~ for 2009 through 2011 model years, and for PCs and LDT1s for 2012 through 2014 ~~that~~ model years.



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For model years 2015 through 2017, the amount of credits earned by a manufacturer in a given model year from ZEVs shall be expressed in units of credits, and shall be equal to the number of credits from ZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements, or, if applicable, requirements specified under subdivision 1962.1(d)(5)(E)3., for the model year subtracted from the number of ZEV credits produced and delivered for sale in California by the manufacturer in the model year or model years.

**(B)** ***Credits from PZEVs.*** For model years 2009 through 2014, ~~T~~the amount of g/mi ~~ZEV~~ credits from PZEVs earned by a manufacturer in a given model year shall be expressed in units of g/mi NMOG, and shall be equal to the total number of PZEVs produced and delivered for sale in California that the manufacturer applies towards meeting its ZEV requirement for the model year subtracted from the total number of PZEV allowances from PZEVs produced and delivered for sale in California by the manufacturer in the model year or model years and then multiplied by the NMOG fleet average requirement for PCs and LDT1s~~, or LDT2s as applicable,~~ for 2009 through 2011 model years, and for PCs and LDT1s for 2012 through 2014 ~~that~~ model years.

For model years 2015 through 2017, the amount of credits earned by a manufacturer in a given model year from PZEVs shall be expressed in units of credits, and shall be equal to the number of credits from PZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements, or, if applicable, requirements specified under subdivision 1962.1(d)(5)(E)3., for the model year subtracted from the number of PZEV credits produced and delivered for sale in California by the manufacturer in the model year or model years.

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**(5)** ***ZEV Credits for Transportation Systems.***

**(A)** ***General.*** In model years 2009 through 2011, a ZEV placed, for two or more years, as part of a transportation system may earn additional ZEV credits, which may be used in the same manner as other credits earned by vehicles of that category, except as provided in subdivision (g)(5)(C) below. In model years 2012~~09 and subsequent~~ through 2017, a ZEV, Type I.5x and Type IIx vehicles, or TZEV placed, for two or more years, as part of a transportation system may earn additional ZEV credits, which may be used in the same manner as other credits earned by vehicles of that category, except as provided in subdivision (d)(5)(E)2. and as provided in ~~section~~subdivision (g)(5)(C) below . In model years 2009 through 2011, an ~~Enhanced AT PZEV~~ TZEV, AT PZEV or PZEV placed as part of a transportation system may earn additional ZEV credits, which may be used in the same manner as other credits earned by vehicles of that category, except as provided in ~~section~~subdivision (g)(5)(C) below. A NEV is not eligible to earn credit for transportation systems. To earn such credits, the manufacturer must demonstrate to the reasonable satisfaction of the Executive Officer



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that the vehicle will be used as a p art of a project that uses an innovative transportation system as described in ~~section~~subdivision (g)(5)(B) below.

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**(C)** ***Cap on Use of Transportation System Credits.***

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**2.** ***~~Enhanced AT PZEVs~~TZEVs*****.** Credits earned or allocated by ~~Enhanced AT PZEVs~~TZEVs pursuant to this ~~section~~subdivision (g)(5), not including all credits earned by the vehicle itself, may be used to satisfy up to one-tenth of a manufacturer's ZEV obligation in any given model year, or, if applicable, up to one-tenth of the total ZEV percentages specified under subdivision 1962.1(d)(5)(E)3., but may only be used in the same manner as other credits earned by vehicles of that category.

* * * * *

**(6)** ***Use of ZEV Credits*****.** For model years 2009 through 2014, ~~A~~a manufacturer may meet the ZEV requirements in any given model year by submitting to the Executive Officer a commensurate amount of g/mi ZEV credits, consistent with ~~section~~subdivision 1962.1(b). For model years 2015 through 2017, a manufacturer may meet the ZEV requirements in any given model year by submitting to the Executive Officer a commensurate amount of ZEV credits, consistent with subdivision 1962.1(b). Credits in each of the categories may be used to meet the requirement for that category as well as the requirements for lesser credit earning ZEV categories, but shall not be used to meet the requirement for a greater credit earning ZEV category. For example, credits produced from ~~Enhanced AT PZEVs~~TZEVs may be used to comply with AT PZEV requirements, but not with the portion that must be satisfied with ZEVs. These credits may be earned previously by the manufacturer or acquired from another party.

**(A)** ***NEVs.*** Credits earned from NEVs offered for sale or placed in service in model years 2001 through 2005 cannot be used to satisfy more than the percentage limits described in the following table:

| ***Model Years*** | ***ZEV Obligation that:*** | ***Percentage limit for NEVs allowed to meet each Obligation[1]:*** |
|---|---|---|
| 2009 – 2011 | Must be met with ZEVs | 50% |
| 2009 | May be met with AT PZEVs but not PZEVs | 75% |
| 2010 – | | 50% |



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| | | |
|---|---|---|
| 2011 | | |
| 2009 – 2011 | May be met with PZEVs | No Limit |
| 2012 – ~~2014~~2017 | Must be met with ZEVs | 0% |
| | May be met with ~~Enhanced AT PZEVs~~TZEVs and AT PZEVs | 50% |
| | May be met with PZEVs | No Limit |

[1] If applicable, obligation in this table means requirements specified under subdivision 1962.1(d)(5)(E)3..

Additionally, credits earned from NEVs ~~offered for sale or~~ placed in service in model years 2006 through 2017 ~~or later~~ can be used to meet the percentage limits described in the following table:

| ***Model Years*** | ***ZEV Obligation that:*** | ***Percentage Limit for NEVs allowed to meet each Obligation[1]:*** |
|---|---|---|
| 2009 - 2011 | May be met through compliance with Primary Requirements | No Limit |
| | May be met through compliance with Alternative Requirements, and must be met with ZEVs | 0% |
| | May be met through compliance Alternative Requirements, and may be met with AT PZEVs or PZEVs | No Limit |
| 2012 – ~~2014~~2017 | Must be met with ZEVs | 0% |
| | May be met with ~~Enhanced AT PZEVs~~TZEVs, AT PZEVs, or PZEVs | No Limit |

[1] If applicable, obligation in this table means requirements specified under subdivision 1962.1(d)(5)(E)3..

This limitation applies to NEV credits earned by the same manufacturer or earned by another manufacturer and acquired.

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**(i)** ***ZEV-Specific Definitions.*** The following definitions apply to this section 1962.1.

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**(5)** "Conventional rounding method" means to increase the last digit to be retained when the following digit is five or greater. Retain the last digit as is when the following digit is four or less.

**(6)** "East Region pool" means the combination Section 177 states east of the Mississippi River.

**(4~~5~~7)**"Electric drive system" means an electric motor and associated power electronics which provide acceleration torque to the drive wheels sometime during normal vehicle operation. This does not include components that could act as a motor, but are configured to act only as a generator or engine starter in a particular vehicle application.

**(5~~6~~8)**"Enhanced AT PZEV" means any model year 2009 through 2011 PZEV that has an allowance of 1.0 or greater per vehicle without multipliers and makes use of a ZEV fuel. Enhanced AT PZEV means Transitional Zero Emission Vehicle.

**(6~~7~~9)**"Neighborhood electric vehicle" or "NEV" means a motor vehicle that meets the definition of Low-Speed Vehicle either in section 385.5 of the Vehicle Code or in 49 CFR 571.500 (as it existed on July 1, 2000), and is certified to zero-emission vehicle standards.

**(7~~8~~10)**"Placed in service" means having been sold or leased to an end-user and not to a dealer or other distribution chain entity, and having been individually registered for on-road use by the California ~~Department of Motor Vehicles~~DMV.

**(~~9~~11)** "Proportional value" means the ratio of a manufacturer's California applicable sales volume to the manufacturer's Section 177 state applicable sales volume. In any given model year, the same applicable sale volume calculation method must be used to calculate proportional value.

**(~~10~~12)** "Range Extended Battery Electric Vehicle" means a vehicle powered predominantly by a zero emission energy storage device, able to drive the vehicle for more than 75 all-electric miles, and also equipped with a backup APU, which does not operate until the energy storage device is fully depleted, and meeting requirements in subdivision 1962.1(d)(5)(G),

**(8~~11~~13)**"Regenerative braking" means the partial recovery of the energy normally dissipated into friction braking that is returned as electrical current to an energy storage device.

**(9~~12~~14)**"Section 177 state" means a state that is administering the California ZEV requirements pursuant to Section 177 of the federal Clean Air Act (42 U.S.C. § 7507).



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**(~~13~~15)** "Transitional Zero Emission Vehicle" means a PZEV that has an allowance of 1.0 or greater, and makes use of a ZEV fuel.

**(~~10~~14~~1~~16)** "Type 0, I, I.5, II, III, IV, and V ZEV" all have the meanings set forth in section 1962.1(d)(5)(A).

**(17)** "West Region pool" means the combination of Section 177 states west of the Mississippi River.

**(~~11~~15~~1~~18)** "ZEV fuel" means a fuel that provides traction energy in on-road ZEVs. Examples of current technology ZEV fuels include electricity, hydrogen, and compressed air.

* * * * *

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 38562, 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43018.5, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43204, 43205, 43206, and 43205.5, Health and Safety Code.



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Adopt section 1962.2, title 13, California Code of Regulation (CCR) to read as follows:

[Note: Set forth below are the 2012 amendments to the California zero emission vehicle (ZEV) regulation. This is a newly adopted regulation is shown without underline as permitted by California Code of Regulations, title 1, section 8. The 15-Day proposed modifications are shown in single underline to indicate additions and ~~single strikeout~~ to indicate deletions.]

## § 1962.2 Zero-Emission Vehicle Standards for 2018 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.

**(a)** ***ZEV Emission Standard.*** The Executive Officer shall certify new 2018 and subsequent model year passenger cars, light-duty trucks, and medium-duty vehicles as ZEVs, vehicles that produce zero exhaust emissions of any criteria pollutant (or precursor pollutant) or greenhouse gas, excluding emissions from air conditioning systems, under any possible operational modes or conditions.

**(b)** ***Percentage ZEV Requirements.***

**(1)** ***General Percentage ZEV Requirement.***

* * * * *

**(B)** ***Calculating the Number of Vehicles to Which the Percentage ZEV Requirement is Applied.*** For 2018 and subsequent model years, a manufacturer's production volume for the given model year will be based on the three-year average of the manufacturer's volume of PCs and LDTs, produced and delivered for sale in California in the prior second, third, and fourth model year [for example, 2019 model year ZEV requirements will be based on California production volume average of PCs and LDTs for the 2015 to 2017 model years]. This production averaging is used to determine ZEV requirements only, and has no effect on a manufacturer's size determination (eg. three-year average calculation method). In applying the ZEV requirement, a PC or LDT, that is produced by one manufacturer (e.g., Manufacturer A), but is marketed in California by another manufacturer (e.g., Manufacturer B) under the other manufacturer's (Manufacturer B) nameplate, shall be treated as having been produced by the marketing manufacturer (i.e., Manufacturer B).

**1.** ***[Reserved]***

**2.** ***[Reserved]***

**3.** A manufacturer may apply to the Executive Officer to be permitted to base its ZEV obligation on the number of PCs and LDTs, produced by the manufacturer and delivered for sale in California that same model year (ie, same model-year calculation method) as an alternative to the three-year averaging of prior year

production described above, for up to two model years, total, between model year 2018 and model year 2025. For the same model-year calculation method to be allowed, a manufacturer's application to the Executive Officer must show that their volume of PCs and LDTs produced and delivered for sale in California has decreased by ~~40~~ at least 30 percent from the previous year due to circumstances that were unforeseeable and beyond their control.

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**(c) Transitional Zero Emission Vehicles (TZEV).**

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**(2)** ***TZEV Requirements*****.** In order for a vehicle to be eligible to receive a ZEV allowance, the manufacturer must demonstrate compliance with all of the following requirements:

**(A)** ***SULEV Standards.*** Certify the vehicle to the 150,000-mile SULEV 20 or 30 exhaust emission standards for PCs and LDTs in subdivision 1961.2(a)(1). Bi-fuel, fuel flexible and dual-fuel vehicles must certify to the applicable 150,000-mile SULEV 20 or 30 exhaust emission standards when operating on both fuels. Manufacturers may certify 2018 and 2019 TZEVs to the 150,000-mile SULEV exhaust emission standards for PCs and LDTs in subdivision 1961(a)(1);

**(B)** ***Evaporative Emissions.*** Certify the vehicle to the evaporative emission standards in subdivision 1976(b)(1)(G). Manufacturers may certify 2018 and 2019 TZEVs to the evaporative standards for PCs and LDTs in subdivision 1976(b)(1)(E);

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**(3)** ***Allowances for TZEVs***

**(A)** ***Zero Emission Vehicle Miles Traveled TZEV Allowance Calculation.*** A vehicle that meets the requirements of subdivision 1962.2(c)(2) and has zero-emission vehicle miles traveled (VMT), as defined by and calculated by 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, and measured as ~~all electric $R_{eda}$.~~ equivalent all electric range (EAER) capability will generate an allowance according to the following equation:



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| *UDDS Test Cycle Range ($R_{cda}$)* | *Allowance* |
|---|---|
| <10 all electric miles | 0.0<u>0</u> |
| ≥10 all electric miles | TZEV Credit = [(0.01) * ~~R~~$_{cda}$<u>EAER</u> + 0.3<u>0</u>] |
| >80 miles (credit cap) | 1.~~3~~<u>10</u> |

**1. Allowance for US06 Capability.** TZEVs with US06 all electric range capability (~~R~~$_{cda}$<u>AER</u>) of at least 10 miles shall earn an additional 0.2 allowance. US06 test cycle range capability shall be determined in accordance with section ~~E~~<u>F</u>.8 of the "California Exhaust Emission Standards and Test Procedures for the 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 subdivision 1962.2(h).

* * * * *

**(d)** ***Qualification for Credits From ZEVs*****.**

* * * * *

**(5)** ***Credits for 2018 and Subsequent Model Year ZEVs.***

**(A)** ***ZEV Credit Calculations*****.** Credits from a ZEV delivered for sale are based on the ZEV's UDDS all electric range, determined in accordance with the "California Exhaust Emission Standards and Test Procedures for the 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, using the following equation:

ZEV Credit = (0.01) * (UDDS range) + 0.5<u>0</u>

* * * * *

**(E)** ***Counting Specified ZEVs Placed in Service in a Section 177 State and in California.***

**<u>1.</u>** ***<u>Provisions for 2018 through 2025 Model Years.</u>*** <u>Large volume manufacturers and intermediate volume manufacturers with credits earned from h~~H~~ydrogen fuel cell vehicles that are certified to the California ZEV standards applicable for the ZEV's model year, delivered for sale and placed in service in California or in a Section 177 state, may be counted towards compliance in California and in all Section 177 states with the percentage ZEV requirements in subdivision 1962.2(b). The credits earned are multiplied by the ratio of a manufacturer's applicable production volume for a model year, as specified in subdivision 1962.2(b)(1)(B), in the state receiving credit to</u>

the manufacturer's applicable production volume as specified in subdivision 1962.2(b)(1)(B), for the same model year in California (hereafter, "proportional value"). Credits generated from ZEV placement in a Section 177 state will be earned at the proportional value in the Section 177 state, and earned in California at the full value specified in subdivision 1962.2(d)(5)(A).

***2. Optional Section 177 State Compliance Path.***

**a.** ***Reduced ZEV and TZEV Percentages.*** Large volume manufacturers and intermediate volume manufacturers that have fully complied with the optional section 177 state compliance path requirements in subdivision 1962.1(d)(5)(E)3. are allowed to meet ZEV percentage requirements and optional TZEV percentages reduced from the minimum ZEV floor percentages and TZEV percentages in subdivision 1962.2(b)(2)(E) in each section 177 state equal to the following percentages of their sales volume determined under subdivision 1962.2(b)(1)(B):

**ZEVs**

| Model Year | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|
| Existing Minimum ZEV Floor | 2.00% | 4.00% | 6.00% | 8.00% |
| Section 177 State Adjustment for Optional Compliance Path | 62.5% | 75% | 87.5% | 100% |
| Minimum Section 177 State ZEV Requirement | 1.25% | 3.00% | 5.25% | 8.00% |

**TZEVs**

| Model Year | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|
| Existing TZEV Percentage | 2.50% | 3.00% | 3.50% | 4.00% |
| Section 177 State Adjustment for Optional Compliance Path | 90.00% | 100% | 100% | 100% |
| New Section 177 State TZEV Percentage | 2.25% | 3.00% | 3.50% | 4.00% |

**Total Percent Requirement**

| Model Year | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|
| New Total Section 177 State Optional Requirements | 3.50% | 6.00% | 8.75% | 12.00% |

**i. Trading and Transferring ZEV and TZEV Credits within West Region Pool and East Region Pool.** Manufacturers that have fully complied with the optional section 177 state compliance path requirements in subdivision 1962.1(d)(5)(E)3. may trade or transfer specified model year ZEV and TZEV credits within the West Region pool to meet the same model year requirements in

subdivision 1962.2(d)(5)(E)2.a, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2019 model year shortfall of 100 credits in State X, the manufacturer may transfer 100 (2019 model year) ZEV credits from State Y, within the West Region pool. Manufacturers that have fully complied with the optional section 177 state compliance path requirements in subdivision 1962.1(d)(5)(E)3. may trade or transfer specified model year ZEV and TZEV credits within the East Region pool to meet the same model year requirements in subdivision 1962.2(d)(5)(E)2.a, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2019 model year shortfall of 100 credits in State W, the manufacturer may transfer 100 (2019 model year) ZEV credits from State Z, within the East Region pool.

**ii. Trading and Transferring ZEV and TZEV Credits between the West Region Pool and East Region Pool**. Manufacturers that have fully complied with the optional section 177 state compliance path requirements in subdivision 1962.1(d)(5)(E)3. may trade or transfer specified model year ZEV and TZEV credits to meet the same model year requirements in subdivision 1962.2(d)(5)(E)2.a. between the West Region pool and the East Region pool; however, any credits traded will incur a premium of 30% of their value. For example, in order for a manufacturer to make up a 2019 model year shortfall of 100 credits in the West Region Pool, the manufacturer may transfer 130 (2019 model year) credits from the East Region Pool. No credits may be traded or transferred to the East Region pool or West Region pool from a manufacturer's California ZEV bank, or from the East Region pool or West Region pool to a manufacturer's California ZEV bank.

**b.** ***Reporting Requirements.*** On an annual basis, by May 1st of the calendar year following the close of a model year, each manufacturer that elects the optional section 177 state compliance path under subdivision 1962.1(d)(5)(E)3, shall submit, in writing, to the Executive Officer and each section 177 state a report, including an itemized list, that indicates where vehicles have been placed within the East Region pool and within the West Region pool. The itemized list shall include the following:

i. The manufacturer's total applicable volume of PCs and LDTs delivered for sale in each section 177 state within the regional pool, as determined under subdivision 1962.2(b)(1)(B).

ii. Make, model, vehicle identification number, credit earned, and section 177 state where delivery for sale of each TZEV and ZEV occurred and to meet manufacturer's requirements under subdivision 1962.2(d)(5)(E)2.a.

**c. *Failure to Meet Optional Section 177 State Compliance Path Requirements.*** A manufacturer that elects the optional section 177 state compliance path under subdivision 1962.1(d)(5)(E)3, and does not meet the modified percentages in subdivision 1962.2(d)(5)(E)2.a. in a model year or make up their deficit within the specified time and with the specified credits allowed by subdivision 1962.2(g)(7)(A) in all section 177 states of the applicable pool, shall be treated as subject to the total ZEV percentage requirements in section 1962.2(b) for the 2018 through 2021 model years in each section 177 state, and the pooling provisions in subdivision 1962.2(d)(5)(E)2.a. shall not apply. Any transfers of ZEV or TZEV credits between section 177 states will be null and void if a manufacturer fails to comply, and ZEV or TZEV credits will return to the section 177 state in which the credits were earned. Penalties shall be calculated separately by each section 177 state where a manufacturer fails to make up the ZEV deficits by the end of the 2018 model year.

**d.** The provisions of section 1962.2 shall apply to a manufacturer electing the optional section 177 state compliance path, except as specifically modified by this subdivision 1962.2(d)(5)(E)2.

* * * * *

**(G) *BEVx.*** A BEVx must meet the following in order to receive credit, based on its all electric UDDS Range, through subdivision 1962.2(d)(5)(A):

* * * * *

**3. *Minimum Zero Emission Range Requirements.*** BEVxs must have a minimum of ~~80~~75 miles UDDS all electric range.

* * * * *

**(g) *Generation and Use of Credits; Calculation of Penalties***

* * * * *

**(2) *ZEV Credit Calculations.***

**(A) *Credits from ZEVs.*** The amount of credits earned by a manufacturer in a given model year from ZEVs shall be expressed in units of credits, and shall be equal to the number of credits from ZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements, or, if applicable, requirements specified under subdivision 1962.2(d)(5)(E)2.a. for the model year subtracted from the number of ZEVs produced and delivered for sale in California by the manufacturer in the model year.

**(B)** ***Credits from TZEVs.*** The amount of credits earned by a manufacturer in a given model year from TZEVs shall be expressed in units of credits, and shall be equal to the total number of TZEVs produced and delivered for sale in California that the manufacturer applies towards meeting its ZEV requirement, or, if applicable, requirements specified under subdivision 1962.2(d)(5)(E)2.a. for the model year subtracted from the total number of ZEV allowances from TZEVs produced and delivered for sale in California by the manufacturer in the model year.

* * * * *

**(5)** ***ZEV Credits for Transportation Systems.***

* * * * *

**(C)** ***Cap on Use of Transportation System Credits****.*

**1.** ***ZEVs*****.** Transportation system credits earned or allocated by ZEVs or BEVxs pursuant to subdivision 1962.1 (g)(5), not including any credits earned by the vehicle itself, may be used to satisfy up to one-tenth of a manufacturer's ZEV obligation in any given model year, and may be used to satisfy up to one-tenth of a manufacturer's ZEV obligation which must be met with ZEVs, as specified in subdivision 1962.2(b)(2)(E), or, if applicable, requirements specified under subdivision 1962.2(d)(5)(E)2.a.. ~~Manufacturers may not use transportation system credits earned by ZEVs to comply with requirements specified in subdivision 1962.2(d)(5)(F)~~

**2.** ***TZEVs*****.** Transportation system credits earned or allocated by TZEVs pursuant to subdivision 1962.1(g)(5), not including all credits earned by the vehicle itself, may be used to satisfy up to one-tenth of the portion of a manufacturer's ZEV obligation that may be met with TZEVs, or, if applicable, the portion of a manufacturer's obligation that may be met with TZEVs specified under subdivision 1962.2(d)(5)(E)2.a. in any given model year, but may only be used in the same manner as other credits earned by vehicles of that category. ~~Manufacturers may not use transportation system credits earned by TZEVs to comply with requirements specified in subdivision 1962.2(d)(5)(F)~~

**(6)** ***Use of ZEV Credits*****.** A manufacturer may meet the ZEV requirements in a given model year by submitting to the Executive Officer a commensurate amount of ZEV credits, consistent with subdivision 1962.2(b). Credits in each of the categories may be used to meet the requirement for that category as well as the requirements for lesser credit earning ZEV categories, but shall not be used to meet the requirement for a greater credit earning ZEV category, except for discounted PZEV and AT PZEV credits. For example, credits produced from TZEVs may be used to comply with the portion of the requirement that may be met with credits from TZEV, but not with the portion that must be satisfied with credits from ZEVs. These credits may be earned previously by the manufacturer or acquired from another party.

**(A)** ***Use of Discounted PZEV and AT PZEV Credits and NEV Credits.*** For model years 2018 through 2025, discounted PZEV and AT PZEV credits, and NEV credits may be used to satisfy up to one-quarter of the portion of a manufacturer's requirement that can be met with credits from TZEVs, or, if applicable, the portion of a manufacturer's obligation that may be met with TZEVs specified under subdivision 1962.2(d)(5)(E)2.a.. Intermediate volume manufacturers may fulfill their entire requirement with discounted PZEV and AT PZEV credits, and NEV credits in model years 2018 and 2019. These credits may be earned previously by the manufacturer or acquired from another party. Discounted PZEV and AT PZEV credits may no longer be used after model year 2025 compliance.

**(B)** ***Use of BEVx Credits.*** BEVx credits may be used to satisfy up to 50% of the portion of a manufacturer's requirement that must be met with ZEV credits.

**(C)** ***GHG-ZEV Over Compliance Credits.***

**1. Application.** Manufacturers may apply to the Executive Officer, no later than ~~May 1, 2018~~December 31, 2016, to be eligible for this subdivision 1962.2(g)(6)(C), based on the following qualifications:

* * * * *

**2. Credit Generation and Calculation.** Manufacturers must calculate their over compliance with section 1961.3 requirements for model years 2018 through 2021 based on compliance with the previous model year standard. For example, to generate credits for this subdivision 1962.2(g)(6)(C) for model year 2018, manufacturers would calculate credits based on model year 2017 compliance with section 1961.3.

* * * * *

**b.** Credits earned under section 1961.3(~~b~~a)(9) may not be included in the calculation of $gCO_2$/mile credits for use in the above equation in subdivision a.

* * * * *

**3. Use of GHG-ZEV Over Compliance Credits.** A manufacturer may use no more than the percentage enumerated in the table below to meet either the total ZEV requirement nor the portion of their ZEV requirement that must be met with ZEV credits, with credits earned under this subdivision 1962.2(g)(6)(C).

| 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|
| 50% | 50% | 40% | 30% |



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Credits earned in any given model year under this subdivision 1962.2(g)(6)(C) may only be used in the applicable model year and may not be used in any other model year.

$gCO_2$/mile credits used to calculate GHG-ZEV over compliance credits under this provision must also be removed from the manufacturer's GHG compliance bank, and cannot be banked for future compliance toward section 1961.3.

**4. Reporting Requirements.** Annually, manufacturers are required to submit calculations of credits for this subdivision 1962.2(g)(6)(C) for the model year, any remaining credits/debits from previous model years under 1961.3, and projected credits/debits for future years through 2021 under section 1961.3 and this subdivision 1962.2(g)(6)(C).

~~**a.**~~ If a manufacturer, who has been granted the ability to generate credits under this subdivision 1962.2(g)(6)(C), fails to over comply by at least 2.00 $gCO_2$/mile in any one year, the manufacturer will be subject to the full ZEV requirements for the model year and future model years, and will not be able to earn credits for any other model year under this subdivision 1962.2(g)(6)(C)

**5.** If the Executive Officer does not make a determination that a Federal greenhouse gas fleet standard is functionally equivalent to subdivision 1961.3, than this subdivision 1962.2(g)(6)(C) 1. through 4. is unavailable for use by any manufacturer.

* * * * *

**(i)** ***ZEV-Specific Definitions.*** The following definitions apply to this section 1962.2.

* * * * *

**(3)** "Conventional rounding method" means to increase the last digit to be retained when the following digit is five or greater. Retain the last digit as is when the following digit is four or less.

**(~~3~~4)** "Discounted PZEV and AT PZEV credits" means credits earned under section 1962 and 1962.1 by delivery for sale of PZEVs and AT PZEVs, discounted according to subdivision 1962.1(g)(2)(F).

**(5)** "East Region pool" means the combination of Section 177 states east of the Mississippi River.

**(~~4~~6)** "Energy storage device" means a storage device able to provide the minimum power and energy storage capability to enable engine stop/start capability, traction boost, regenerative braking, and (nominal) charge sustaining mode driving capability. In the case of TZEVs, a minimum range threshold relative to certified, new-vehicle range capability is not specified or required.

**(~~5~~7)** "Hydrogen fuel cell vehicle" means a ZEV that is fueled primarily by hydrogen, but may also have off-vehicle charge capability.

**(~~6~~8)** "Hydrogen internal combustion engine vehicle" means a TZEV that is fueled exclusively by hydrogen.

**(~~7~~9)** "Majority ownership situations" means when one manufacturer owns another manufacturer more than 33.4%, for determination of size under CCR ~~S~~section 1900.

**(~~8~~10)** "Manufacturer US PC and LDT Sales" means a manufacturer's total passenger car and light duty truck (up to 8,500 pounds loaded vehicle weight) sales sold in the United States of America in a given model year.

**(~~9~~11)** "Neighborhood electric vehicle" or "NEV" means a motor vehicle that meets the definition of Low-Speed Vehicle either in section 385.5 of the Vehicle Code or in 49 CFR 571.500 (as it existed on July 1, 2000), and is certified to zero-emission vehicle standards.

**(~~10~~12)** "Placed in service" means having been sold or leased to an end-user and not to a dealer or other distribution chain entity, and having been individually registered for on-road use by the California DMV.

**(~~11~~13)** "Proportional value" means the ratio of a manufacturer's California applicable sales volume to the manufacturer's Section 177 state applicable sales ~~vome~~volume. In any given model year, the same applicable sales volume calculation method must be used to calculate proportional value.

**(~~12~~14)** "Range Extended Battery Electric Vehicle" or "BEVx" means a vehicle powered predominantly by a zero emission energy storage device, able to drive the vehicle for more than 75 all-electric miles, and also equipped with a backup APU, which does not operate until the energy storage device is fully depleted, and meeting requirements in subdivision 1962.2(d)(5)(G).

**(~~13~~15)** "Section 177 state" means a state that is administering the California ZEV requirements pursuant to Section 177 of the federal Clean Air Act (42 U.S.C. § 7507).

**(~~14~~16)** "Transitional zero emission vehicle" or "TZEV" means a vehicle that meet the all criteria of subdivision 1962.2(c)(2) and qualifies for an allowance in subdivision 1962.2(c)(3)(D) or (E).

**(17)** "West Region pool" means the combination of Section 177 states west of the Mississippi River.



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**(~~15~~18)** "Zero emission vehicle" or "ZEV" means a vehicle that produces zero exhaust emissions of any criteria pollutant (or precursor pollutant) or greenhouse gas under any possible operational modes or conditions.

**(~~16~~19)** "Zero emission vehicle fuel" means a fuel that provides traction energy in on-road ZEVs. Examples of current technology ZEV fuels include electricity, hydrogen, and compressed air.

**(j)** ***Abbreviations.*** The following abbreviations are used in this section 1962.2:

* * * * *

~~"$EAER_{u40}$" means the equivalent all-electric range that a 40 mile $R_{cda}$ plug-in hybrid electric vehicle achieves.~~

* * * * *

~~"$R_{cda}$" means charge depletion actual range (urban Cycle).~~

* * * * *

~~"UF" means utility factor.~~

* * * * *

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 38562, 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43018.5, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204, and 43205.5, Health and Safety Code.

Amend and Renumber section 1962.2, title 13, California Code of Regulation (CCR), to read as follows:

[Note: Set forth below are the 2012 amendments to the electric vehicle charging requirements. The text of the amendments is shown in underline to indicate additions and ~~strikeout~~ to indicate deletions, compared to the preexisting regulatory language. The further proposed amendments subject to comment are shown in double underline to indicate additions and ~~double strikeout~~ to show deletions. All other portions remain unchanged and are indicated by the symbol "* * * * *" for reference.]

**§ 1962.~~2.~~3. Electric Vehicle Charging Requirements**

* * * * *

(c) *Requirements*.

(1) Beginning with the 2006 model year, all vehicles identified in subsection (a) must be equipped with a conductive charger inlet ~~port~~ and charging system which meets all the specifications applicable to AC Level 1 and Level 2 charging contained in Society of Automotive Engineers (SAE) Surface Vehicle Recommended Practice SAE J1772 REV ~~NOV 2001~~ JAN 2010, SAE Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charge Coupler, which is incorporated herein by reference. All such vehicles must also be equipped with an on-board charger with a minimum output of 3.3 ~~kilovolt amps.~~kilowatts, or, sufficient power to enable a complete charge in less than 4 hours.

(2) A manufacturer may apply to the Executive Officer for approval to use an alternative to the AC inlet described in subsection (c)(1), provided that the following conditions are met:

(A) each vehicle is supplied with a rigid adaptor that would enable the vehicle to meet all of the remaining system and on-board charger requirements described in subsection (c)(1); and

(B) the rigid adaptor and alternative inlet must be tested and approved by a Nationally Recognized Testing Laboratory (NRTL).

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204 and 43205.5, Health and Safety Code. Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 38562, 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43018.5, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204 and 43205.5, Health and Safety Code.



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**Attachment B**

California Environmental Protection Agency
AIR RESOURCES BOARD

# PROPOSED 15-DAY MODIFICATIONS

# 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

Adopted: December 17, 2008
Amended: December 2, 2009
Amended: [insert date]

[Note: This document shows the originally proposed changes to the preexisting language text in underline to indicate additions and strikeout to indicate deletions. Modifications to the original proposal are shown in double underline to indicate additions and ~~double strikeout~~ to indicate deletions. Existing intervening text that is not proposed to be amended is indicated by "* * * *".]



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**California Exhaust Emission Standards and Test Procedures For 2009 Through 2017~~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 1962.1)

* * * * *

## B. Definitions and Terminology.

### 1. Definitions.

* * * * *

"**Conventional rounding method**" means to increase the last digit to be retained when the following digit is five or greater. Retain the last digit as is when the following digit is four or less.

"**East Region pool**" means the combination Section 177 states east of the Mississippi River.

* * * * *

"**West Region pool**" means the combination of Section 177 states west of the Mississippi River.

* * * * *

## C. Zero-Emission Vehicle Standards.

* * * * *

### 2. Percentage ZEV Requirements

### 2.1 General Percentage ZEV Requirement.

* * * * *

(2) For 2012 ~~and subsequent~~through 2017 model years, a manufacturer's production volume for the given model year will be based on the three-year average of the manufacturer's volume of PCs and LDT~~1s, and LDT2s, as applicable,~~ produced and delivered for sale in California in the prior fourth, fifth and sixth model year (for example, 2013 model year ZEV requirements will be based on California production volume of PCs and LDT~~1~~s, ~~and LDT2s as applicable,~~ for the 2007 to 2009 model years, and 2014



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model year ZEV requirements will be based on California production volume of PCs and LDTs, for the 2008 to 2010 model years). ~~This production averaging is used to determine ZEV requirements only, and has no effect on a manufacturer's size determination.~~ As an alternative to the three-year averaging of prior year production described above, a manufacturer may elect to base its ZEV obligation on the number of PCs and LDT~~1~~s~~, and LDT2s, as applicable,~~ produced by the manufacturer and delivered for sale in California that same model year. ~~For 2012 and subsequent model years, a~~ A ~~manufacturer may, on an annual basis, select either the three-year average or the same model year calculation method. In applying the ZEV requirement, a PC, LDT1, or LDT2 as applicable, that is produced by one manufacturer (e.g., Manufacturer A), but is marketed in California by another manufacturer (e.g., Manufacturer B) under the other manufacturer's (Manufacturer B) nameplate, shall be treated as having been produced by the marketing manufacturer (Manufacturer B).~~

* * * * *

**2.7 Changes in Small Volume, Independent Low Volume, and Intermediate Volume Manufacturer Status.**

(a) *Increases in California Production Volume.* In 2009 ~~and subsequent~~ through 2017 model years, if a small volume manufacturer's average California production volume exceeds 4,500 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, or if an independent low volume manufacturer's average California production volume exceeds 10,000 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, the manufacturer shall no longer be treated as a small volume, or independent low volume manufacturer, as applicable, and shall comply with the ZEV requirements for intermediate volume manufacturers, as applicable, beginning with the sixth model year after the last of the three consecutive model years.

If an intermediate volume manufacturer's average California production volume exceeds 60,000 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years (i.e., total production volume exceeds 180,000 vehicles in a three year period), the manufacturer shall no longer be treated as an intermediate volume manufacturer and shall, beginning with the sixth model year after the last of the three consecutive model years, or in model year 2018 (whichever occurs first), comply with all ZEV requirements for large volume manufacturers

~~Requirements will begin in the fourth model year, or in model year 2018 (whichever occurs first) rather than the sixth model year when a manufacturer ceases to be a small or intermediate independent low volume manufacturer in 2003 or subsequent years due to the aggregation requirements in majority ownership situations, except that if the majority ownership in the manufacturer was acquired prior to the 2001 model year,~~

~~the manufacturer must comply with the stepped-up ZEV requirements starting in the 2010 model year.~~ Requirements will begin in the ~~fourth~~ sixth model year, or in model year 2018 (whichever occurs first) ~~rather than the sixth model year~~ when a manufacturer ceases to be an intermediate volume manufacturer in 2003 or subsequent years due to the aggregation requirements in majority ownership situation.

* * * * *

**3. Partial ZEV Allowance Vehicles (PZEVs).**

* * * * *

**3.2 Baseline PZEV Allowance**. In order for a vehicle to be eligible to receive a PZEV allowance, the manufacturer must demonstrate compliance with all of the following requirements. A qualifying vehicle will receive a baseline PZEV allowance of 0.2.

(a) *SULEV Standards.* For 2009 through 2014 model years, ~~C~~certify the vehicle to the 150,000-mile SULEV exhaust emission standards for PCs and LDTs in ~~section~~subdivision 1961(a)(1), title 13, CCR. Bi-fuel, fuel-flexible and dual-fuel vehicles must certify to the applicable 150,000-mile SULEV exhaust emission standards when operating on both fuels. For 2015 through 2017 model years, certify the vehicle to the 150,000-mile SULEV 20 or 30 exhaust emission standards for PCs and LDTs in subdivision 1961.2(a)(1). Bi-fuel, fuel flexible and dual-fuel vehicles must certify to the applicable 150,000-mile SULEV 20 or 30 exhaust emission standards when operating on both fuels;

(b) *Evaporative Emissions.* For 2009 through 2014 model years, ~~C~~certify the vehicle to the evaporative emission standards in ~~section~~subdivision 1976(b)(1)(E), title 13, CCR(zero-fuel evaporative emissions standards). For 201~~5~~4 through 2017 model years, certify the vehicle to the evaporative emission standards in subdivision 1976(b)(1)(G) or subdivision 1976(b)(1)(E);

* * * * *

**3.3 Zero-Emission VMT PZEV Allowance**.

(a) *Calculation of Zero Emission VMT Allowance.* A vehicle that meets the requirements of ~~section~~subdivision C.3.2 and has zero-emission vehicle miles traveled ("VMT") capability will generate an additional zero emission VMT PZEV allowance, calculated as follows:



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| **Range** | *Zero-emission VMT Allowance* |
|---|---|
| $EAER_u$ < 10 miles | 0.0 |
| $EAER_u$ ≥10 ~~miles~~ to 40 miles ~~and~~ ~~$R_{cda}$ = 10 miles to 40 miles~~ | $EAER_u$ x (1 – $UF_{Rcda}$)/11.028 |
| ~~$R_{cda}$~~ $EAER_u$ > 40 miles | ~~$EAER_{u40}$/ 29.63~~ $(EAER_{u40})$ x [1 – $(UF_{40}*R_{cda}/EAER_u)$]/ 11.028<br>Where,<br>$UF_{40}$= utility factor at 40 miles<br>$EAER_{u40}$= 40 miles |

A vehicle cannot generate more than 1.39 zero-emission VMT PZEV allowance.

The urban equivalent all-electric range ($EAER_u$) and charge depleting actual range (urban cycle) ($R_{cda}$) shall be determined in accordance with sections ~~F.11~~ G.5.4 and ~~F.5.4~~G.11.9, respectively, of these test procedures. The utility Factor (UF) based on the charge depleting actual range (urban cycle) ($R_{cda}$) shall be determined according to Section 4.5.2 Equation ~~5~~6 and the "Fleet UF" Utility Factor Equation Coefficients in Section 4.5.2, Table 3 of SAE J2841 March 2009.

~~(b) *Alternative Procedures.* As an alternative to determining the zero-emission VMT allowance in accordance with the preceding section C.3.3(a), a manufacturer may submit for Executive Officer approval an alternative procedure for determining the zero-emission VMT potential of the vehicle as a percent of total VMT, along with an engineering evaluation that adequately substantiates the zero-emission VMT determination. For example, an alternative procedure may provide that a vehicle with zero-emissions of one regulated pollutant (e.g., NOx) and not another (e.g., NMOG) will qualify for a zero-emission VMT allowance of 1.5.~~

* * * * *

**4. Qualification for ZEV Multipliers and Credits.**

* * * * *

(c) *ZEV Credits for 2009 ~~and Subsequent~~ through 2017 Model-Year ZEVs.* A 2009 ~~and subsequent~~through 2017 model-year ZEV, other than a NEV or Type 0, earns 1 ZEV credit when it is produced and delivered for sale in California. A 2009 ~~and subsequent~~through 2017 model-year ZEV earns additional credits based on the earliest year in which the ZEV is placed in service (not earlier than the ZEV's model year). The vehicle must be delivered for sale and placed in service in ~~the same state (i.e California)~~a Section 177 state or in California in order to earn the total credit amount. The total credit amount will be earned in the state (i.e. California or a Section 177 state) in which the vehicle was delivered for sale. The following table identifies the total credits that a ZEV in each of the eight ZEV tiers will earn, including the credit not contingent on placement in service, if it is placed in service in the specified calendar year or by June 30 after the end of the specified calendar year. A vehicle is not eligible to receive credits if it is placed in service after December 31, five calendar years after the model year. For example, if a vehicle is produced in 2012, but does not get placed until January 1, 2018, the vehicle would no longer be eligible for ZEV credits.

* * * * *

(e) *Counting Specified ZEVs Placed in a Section 177 State and in California.*

(1) *Provisions for 2009 Model Year.*

(A) ~~Manufacturers with a ZEV requirement producing~~ Large volume manufacturers and intermediate volume manufacturers with credits earned from ZEVs, excluding NEVs and Type 0 ZEVs, that are either certified to the California ZEV standards or approved as part of an advanced technology demonstration program and are placed in service in a section 177 state, may be counted towards compliance with the California percentage ZEV requirements in ~~section~~subdivision C.2, including the requirements in ~~section~~subdivision C.2.2(b), as if they were delivered for sale and placed in service in California.

(B) ~~Manufacturers with a ZEV requirement producing~~ Large volume manufacturers and intermediate volume manufacturers with credits earned from ZEVs, excluding NEVs and Type 0 ZEVs, that are either certified to the California ZEV standards or approved as part of an advanced technology demonstration program and are placed in service in California may be counted towards compliance with the percentage ZEV requirements of ~~any~~all section 177 state, including requirements based on ~~section~~subdivision C.2.2(B).

(2) *Provisions for 2010 and Subsequent Model Years.* ~~Manufacturers with a ZEV requirement producing~~ ~~Specified model year~~ Large volume manufacturers and intermediate volume manufacturers with credits earned from ZEVs, including Type I.5x and Type IIx vehicles, and excluding NEVs and Type 0 ZEVs,, that are either certified to the California ZEV standards applicable for the ZEV's model year or approved as part of an advanced technology demonstration program and are placed in service in California



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or in a section 177 state may be counted towards compliance in California and in all section 177 states, with the percentage ZEV requirements in ~~section~~subdivision C.2, provided that the credits are multiplied by the ratio of a~~n LVM's~~manufacturer's applicable production volume for a model year, as specified in ~~section~~subdivision C.2.1(b) in the state receiving credit to the ~~LVM's~~manufacturer's applicable production volume (hereafter, "proportional value"), as specified in ~~section~~subdivision C.2.1(b) for the same model year in California. Credits generated in a section 177 state will be earned at the proportional value in the section 177 state, and earned in California at the full value specified in ~~section~~subdivision C.4.5(d) However, credits generated by 2010 and 2011 model-year vehicles produced, delivered for sale, and placed in service, or as part of an advanced technology demonstration program in California to meet the any section 177 state's requirements that implement ~~section~~subdivision C.2.2(b) requirements are exempt from proportional value, with the maximum number of credits allowed to be counted towards compliance in a section 177 state being limited to the number of credits needed to satisfy a manufacturer's section 177 state's requirements to implement ~~section~~subdivision C.2.2(b)(1)(B). The table below specifies the qualifying model years for each ZEV type that may be counted towards compliance in all section 177 states.

| Vehicle Type | Model Years: |
|---|---|
| Type I, I.5, or II ZEV | 2009 – ~~2014~~2017 |
| Type III, IV, or V ZEV | 2009 – 2017 |
| Type I.5x or Type IIx | 2012 – 2017 |

(3) *Optional Section 177 State Compliance Path.* Large volume manufacturers and intermediate volume manufacturers that choose to elect the optional section 177 state compliance path must notify the Executive Officer and each section 177 state in writing no later than September 1, 2014.

(A) *Additional 2016 and 2017 Model Year ZEV Requirements.* Large volume manufacturers and intermediate volume manufacturers that elect the optional section 177 state compliance path must generate additional 2012 through 2017 model year ZEV credits, including no more than 50% Type 1.5x and Type IIx vehicle credits and excluding all NEV and Type 0 ZEV credits, in each section 177 state equal to the following percentages of their sales volume determined under subdivision C.4.5(e)(3)(A)1.:

| Model Years | Additional Section 177 State ZEV Requirements |
|---|---|
| 2016 | 0.75% |
| 2017 | 1.50% |

Subdivision C.4.5(e)(2) shall not apply to any ZEV credits used to meet a manufacturer's additional 2016 and 2017 model year ZEV requirements under this

subdivision C.4.5(e)(3)(A). ZEVs produced to meet a manufacturer's additional 2016 and 2017 model year ZEV requirements under this subdivision C.4.5(e)(3)(A) must be placed in service in the section 177 states no later than June 30, 2018.

1. *Trading and Transferring ZEV Credits within the West Region Pool and East Region Pool.* Manufacturers may trade or transfer specified model year ZEV credits used to meet the same model year requirements in subdivision C.4.5(e)(3)(C), within the West Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 model year shortfall of 100 credits in State X, the manufacturer may transfer 100 (2016 model year) ZEV credits, from State Y, within the West Region pool. Manufacturers may trade or transfer specified model year ZEV credits, used to meet the same model year requirements in subdivision C.4.5(e)(3)(C), within the East Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 model year shortfall of 100 credits in State W, the manufacturer may transfer 100 (2016 model year) ZEV credits from State Z, within the East Region pool.

2. *Trading and Transferring ZEV Credits between the West Region Pool and East Region Pool.* Manufacturers may trade or transfer specific model year ZEV credits used to meet the same model year requirements in subdivision C.4.5(e)(3)(C) between the West Region pool and the East Region pool; however, any credits traded or transferred will incur a premium of 30% of their value. For example, in order for a manufacturer to make up a 2016 model year shortfall of 100 credits in the West Region Pool, the manufacturer may transfer 130 (2016 model year) ZEV credits from the East Region Pool. No credits may be traded or transferred to the East Region pool or West Region pool from a manufacturer's California ZEV bank, or from the East Region pool or West Region pool to a manufacturer's California ZEV bank.

**(**B) *Reduced TZEV Percentages.* Large volume manufacturers and intermediate volume manufacturers that elect the optional section 177 state compliance path and that fully comply with the additional 2016 and 2017 model year ZEV requirements in this subdivision C.4.5(e)(3)(A). are allowed to meet TZEV percentages reduced from the allowed TZEV percentages in subdivision C.2.2(d)(2) and (3) in 2015 through 2017 model year in each section 177 state as enumerated below:

| Model Year | 2015 | 2016 | 2017 |
|---|---|---|---|
| Existing TZEV Percentage | 3.00% | 3.00% | 3.00% |



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| | | | |
|---|---|---|---|
| Section 177 State Adjustment for Optional Compliance Path for TZEVs | 75.00% | 80.00% | 85.00% |
| New Section 177 State Optional Compliance Path TZEV Percentage | 2.25% | 2.40% | 2.55% |

Manufacturers may meet the reduced TZEV percentages above with credits from ZEVs or credits from TZEVs. These reduced TZEV percentages also reduce the total ZEV percent requirement, as illustrated in subdivision C.4.5(e)(3)(C).

1. *Trading and Transferring TZEV Credits within the West Region Pool and East Region Pool.* Manufacturers may trade or transfer specified TZEV credits to meet the same model year subdivision C.4.5(e)(3)(C) percentages within the West Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 shortfall of 100 credits in State X, the manufacturer may transfer 100 (2016 model year) TZEV credits from State Y, within the West Region pool. Manufacturers may trade or transfer TZEV credits to meet the same model year subdivision C.4.5(e)(3)(C) within the East Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 model year shortfall of 100 credits in State W, the manufacturer may transfer 100 (2016 model year) TZEV credits from State Z, within the East Region pool.

2. *Trading and Transferring TZEV Credit between the West Region Pool and East Region Pool.* Manufacturers may trade or transfer specified TZEV credits used to meet the same model year percentages in subdivision C.4.5(e)(3)(C) between the West Region pool and the East Region pool; however, any credits transferred will incur a premium of 30% of their value. For example, in order for a manufacturer to make up a 2016 model year shortfall of 100 credits in the West Region Pool, the manufacturer may transfer 130 (2016 model year) TZEV credits from the East Region Pool. No credits may be traded or transferred to the East Region pool or West Region pool from a manufacturer's California ZEV bank, or from the East Region pool or West Region pool to a manufacturer's California ZEV bank.

(C) *Total Requirement Percentages.* Requirements for the minimum ZEV floor, and allowed percentages for AT PZEVs and PZEVs in subdivision C.2 remain in effect for large and intermediate volume manufacturers choosing the optional section 177 state compliance path in each section 177 state. However, the optional section 177 compliance path requires manufacturers to meet additional ZEV requirements and allows manufacturers to meet reduced TZEV percentages as described above in subdivision C.4.5(e)(3)(A) and (B). The table below enumerates the total annual

percentage obligation in each section 177 state for the 2015 through 2017 model years if the manufacturer elects the optional section 177 state compliance path and produces the minimum number of credits required to meet its minimum ZEV floor and the maximum percentage allowed to be met with credits from TZEVs, AT PZEVs and PZEVs.

| Years | Total ZEV Percent Requirement for Optional Compliance Path | Minimum ZEV Floor for Optional Compliance Path | TZEVs for Optional Compliance Path | AT PZEVs (no change) | PZEVs (no change) |
|---|---|---|---|---|---|
| 2015 | 13.25% | 3.00% | 2.25% | 2.00% | 6.00% |
| 2016 | 14.15% | 3.75% | 2.40% | 2.00% | 6.00% |
| 2017 | 15.05% | 4.50% | 2.55% | 2.00% | 6.00% |

**d. *Reporting Requirements.*** On an annual basis, by May 1st of the calendar year following the close of a model year, each manufacturer that elects the optional section 177 state compliance path shall submit, in writing, to the Executive Officer and each section 177 state a report, including an itemized list, that demonstrates the manufacturer has met the requirements of this subdivision C.4.5(e)(3)(C) in each section 177 state as well as in the East Region pool and in the West Region pool. The itemized list shall include the following:

i. The manufacturer's total applicable volume of PCs and LDTs delivered for sale in each section 177 state within the pool, as determined under subdivision C.2.1(b).

ii. Make, model, vehicle identification number, credit earned, and section 177 state where delivery for sale and placement in service for ZEV occurred to meet the manufacturer's additional ZEV obligation under subdivision C.4.5(e)(3)(A)

iii. Make, model, vehicle identification number, credit earned, and section 177 state where delivery for sale of each TZEV occurred and section 177 state where delivery for sale and placement in service of each ZEV occurred to meet manufacturer's requirements under subdivision C.4.5(e)(3)(C)

**e. *Failure to Meet Optional Section 177 State Compliance Path Requirements.*** A manufacturer that elects the optional section 177 state compliance path and does not meet the requirements in subdivision C.4.5(e)(3)(A) by June 30, 2018 in all section 177 states within an applicable pool shall be treated as subject to the total

ZEV percentage requirements in section C.2 for the 2015 through 2017 model years in each section 177 state and the pooling provisions in subdivision C.4.5(e)(3)(A) shall not apply. Any transfers of ZEV credits between section 177 states will be null and void, and ZEV credits will return to the section 177 state in which the credits were earned. A manufacturer that elects the optional section 177 state compliance path and does not meet the percentages in subdivision C.4.5(e)(3)(B) in a model year or make up their deficit within the specified time and with the specified credits allowed by subdivision C.7.7(a) in all section 177 states within an applicable pool shall be treated as subject to the ZEV percentage requirements in section C.2 for the 2015 through 2017 model years and the pooling provisions in subdivision C.4.5(e)(3)(B) shall not apply. Any transfers of TZEV credits between section 177 states will be null and void if a manufacturer fails to comply, and TZEV credits will return to the section 177 state in which the credits were earned. Penalties shall be calculated separately by each section 177 state where a manufacturer fails to make up the ZEV deficits by the end of the 2018 model year.

**f.** The provisions in section C shall apply to a manufacturer electing the optional section 177 state compliance path, except as specifically modified by this subdivision C.4.5(e)(3).

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### 7. Generation and Use of ZEV Credits; Calculation of Penalties

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### 7.2 ZEV Credit Calculations.

(a) *Credits from ZEVs*. For model years 2009 through 2014, ~~T~~the amount of g/mi ~~ZEV~~ credits earned by a manufacturer in a given model year from ZEVs shall be expressed in units of g/mi NMOG, and shall be equal to the number of credits from ZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements for the model year subtracted from the number of ZEVs produced and delivered for sale in California by the manufacturer in the model year and then multiplied by the NMOG fleet average requirement for PCs and LDT1s~~, or LDT2s as applicable,~~ for 2009 through 2011 model years , and for PCs and LDT1s for 2012 through 2014 ~~that~~ model years.

For model years 2015 through 2017, the amount of credits earned by a manufacturer in a given model year from ZEVs shall be expressed in units of credits, and shall be equal to the number of credits from ZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements, or, if applicable, requirements specified under subdivision C.4.5(e)(3) for the model year subtracted from the number of ZEV credits produced and delivered for sale in California by the manufacturer in the model year or model years.

(b) *Credits from PZEVs.* For model years 2009 through 2014, ~~T~~the amount of g/mi ~~ZEV~~ credits from PZEVs earned by a manufacturer in a given model year shall be expressed in units of g/mi NMOG, and shall be equal to the total number of PZEVs produced and delivered for sale in California that the manufacturer applies towards meeting its ZEV requirement for the model year subtracted from the total number of PZEV allowances from PZEVs produced and delivered for sale in California by the manufacturer in the model year and then multiplied by the NMOG fleet average requirement for PCs and LDT1s~~, or LDT2s as applicable,~~ for 2009 through 2011 model years , and for PCs and LDT1s for 2012 through 2014 ~~that~~ model years.

For model years 2015 through 2017, the amount of credits earned by a manufacturer in a given model year from PZEVs shall be expressed in units of credits, and shall be equal to the number of credits from PZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements, or, if applicable, requirements specified under subdivision C.4.5(e)(3), for the model year subtracted from the number of PZEV credits produced and delivered for sale in California by the manufacturer in the model year or model years.

* * * * *

**7.5 ZEV Credits for Transportation Systems**.

(a) *General.* In model years 2009 through 2011, a ZEV placed, for two or more years, as part of a transportation system may earn additional ZEV credits, which may be used in the same manner as other credits earned by vehicles of that category, except as provided in subdivision C.7.5(c) below. In model years 201209 ~~and subsequent~~ through 2017, a ZEV or TZEV placed, for two or more years, as part of a transportation system may earn additional ZEV credits, which may be used in the same manner as other credits earned by vehicles of that category, except as provided in subdivision C.4.5(e)(2) and as provided in ~~section~~subdivision C.7.5(c) below. In model years 2009 through 2011, an ~~Enhanced AT PZEV~~ ~~TZEV~~, AT PZEV or PZEV placed as part of a transportation system may earn additional ZEV credits, which may be used in the same manner as other credits earned by vehicles of that category, except as provided in ~~section~~subdivision C.7.5(c) below. A NEV is not eligible to earn credit for transportation systems. To earn such credits, the manufacturer must demonstrate to the reasonable satisfaction of the Executive Officer that the vehicle will be used as a part of a project that uses an innovative transportation system as described in ~~section~~subdivision C.7.5(b) below.

* * * * *

(c) *Cap on Use of Credits.*

* * * * *

(2) ~~*Enhanced AT PZEVs*~~*TZEVs*. Credits earned or allocated by ~~Enhanced AT PZEVs~~TZEVs pursuant to this ~~section~~subdivision C.7.5, not including all credits



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earned by the vehicle itself, may be used to satisfy up to one-tenth of a manufacturer's ZEV obligation in any given model year, or, if applicable, requirements specified under subdivision 4.5(e)(3), but may only be used in the same manner as other credits earned by vehicles of that category.

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**7.6 Use of ZEV Credits**. For model years 2009 through 2014, ~~A~~a manufacturer may meet the ZEV requirements in any given model year by submitting to the Executive Officer a commensurate amount of g/mi ZEV credits, consistent with ~~section~~subdivision C.2. For model years 2015 through 2017, a manufacturer may meet the ZEV requirements in any given model year by submitting to the Executive Officer a commensurate amount of ZEV credits, consistent with subdivision C.2. Credits in each of the categories may be used to meet the requirement for that category as well as the requirements for lesser credit earning ZEV categories, but shall not be used to meet the requirement for a greater credit earning ZEV category. For example, credits produced from ~~Enhanced AT PZEVs~~TZEVs may be used to comply with AT PZEV requirements, but not with the portion that must be satisfied by ZEVs. These credits may be earned previously by the manufacturer or acquired from another party.

(a) *NEVs.* Credits earned from NEVs offered for sale or placed in service in model years 2001 through 2005 cannot be used to satisfy more than the percentage limits described in the following table:

| Model Years | ZEV Obligation that: | Percent limit for NEVs allowed to meet each Obligation[1]: |
|---|---|---|
| 2009 – 2011 | Must be met with ZEVs | 50% |
| 2009 | May be met with AT PZEVs but not PZEVs | 75% |
| 2010 – 2011 | | 50% |
| 2009 – 2011 | May be met with PZEVs | No Limit |
| 2012 – ~~2014~~2017 | Must be met with ZEVs | 0% |
| | May be met with ~~Enhanced AT PZEVs~~TZEVs and AT PZEVs | 50% |
| | May be met with PZEVs | No Limit |

[1] If applicable, obligation in this table means requirements specified under subdivision 4.5(e)(3).



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Additionally, credits earned from NEVs ~~offered for sale or~~ placed in service in model years 2006 through 2017 ~~or later~~ can be used to meet the percentage limits described in the following table:

| Model Years | ZEV Obligation that: | Percent Limit for NEVs allowed to meet each Obligation[1]: |
|---|---|---|
| 2009 - 2011 | May be met through compliance with Primary Requirements | No Limit |
| | May be met through compliance with Alternative Requirements, and must be met with ZEVs | 0% |
| | May be met through compliance Alternative Requirements, and may be met with AT PZEVs or PZEVs | No Limit |
| 2012 – ~~2014~~2017 | Must be met with ZEVs | 0% |
| | May be met with ~~Enhanced AT PZEVs~~TZEVs, AT PZEVs, or PZEVs | No Limit |

[1] If applicable, obligation in this table means requirements specified under subdivision 4.5(e)(3).

This limitation applies to credits earned by the same manufacturer or earned by another manufacturer and acquired.

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## D. Certification Requirements.

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**3. ZEV Reporting Requirements.** In order to verify the status of each manufacturer's compliance with the ZEV requirements for a given calendar year, each manufacturer shall submit a report to the Executive Officer at least annually, by May 1 of the calendar year following the close of the model year, that identifies the necessary delivery and placement data of all vehicles generating ZEV credits or allowances, and all transfers and acquisitions of ZEV credits. The manufacturer may update the report by September 1 to cover activities occurring between April 1 and June 30. If a manufacturer updates their annual California production numbers in their ZEV report, the annual NMOG production must also be updated.

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~~E~~F. Test Procedures for 2012 through 2017~~and Subsequent~~ Model Zero-Emission



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Vehicles (including Fuel Cell Vehicles and Hybrid Fuel Cell Vehicles) and All 2012 through 2017~~and Subsequent~~ Model Hybrid-Electric Vehicles, Except Off-Vehicle Charge Capable Hybrid Electric Vehicles.

The "as adopted or amended dates" of the 40 CFR Part 86 regulations referenced by this document are the dates identified in the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles." Unless otherwise noted, these requirements shall apply to all ZEVs (including fuel cell vehicles and hybrid fuel cell vehicles) and all HEVs, except off-vehicle charge capable HEVs. A manufacturer may elect to certify a 2009, 2010, or 2011 model-year zero-emission vehicle or hybrid electric vehicle, except an off-vehicle charge capable hybrid electric vehicle, using this section ~~E~~F.

~~F~~G. Test Procedures for 2012 through 2017 ~~and Subsequent~~ Model Off-Vehicle Charge Capable Hybrid Electric Vehicles.

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**12. The Calculations of the Combined Green House Gas Regulatory Rating of Off-vehicle Charge Capable Hybrid Electric Vehicles**

12.1 The combined Greenhouse Gas (GHG) emissions value is determined by the following equation.

$GHG_{PHEV,\ combined} = 0.55 * (GHG_{urban}) + 0.45 * (GHG_{highway})$ (Eq. 1)

12.2 The urban GHG emissions value for off-vehicle charge capable hybrid electric vehicles is calculated using the following equations.

12.2.1 The urban GHG emissions value is determined by the following equation.

$$GHG_{urban} = \sum_{i=1}^{N_{urban}} (UF_i) * (\frac{Y_{CD.i}}{D_i} + GHG_{cd.AC.i}) - \sum_{i=1}^{N_{urban}} (UF_i) * G_{upstream} + (1 - \sum_{i=1}^{N_{urban}} (UF_i)) * (Y_{cs.urban})$$

(Eq. 2)

Where,

$GHG_{urban}$ = Rated urban GHG emissions for PHEV, in $gCO_2e$/mile
$i$ = Number of charge-depleting urban test cycle
$N_{urban}$ = Total number of urban test cycles in charge depleting to charge sustaining range ($R_{cdtcs}$)
$UF_i$ = Utility factor for urban test cycle $i$
$Y_{CD.i}$ = Mass emissions of $CO_2$ in grams per vehicle mile, for the "$i$"th test in the charge depleting test



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$D_i$ = Distance of the "*i*"th urban test cycle, in miles.
$GHG_{cd.AC.i}$ = Rated GHG emissions for test cycle *i*, in $gCO_2e$/mile
$Y_{cs.urban}$ = Weighted mass emissions of $CO_2$ in grams/mi of the charge sustaining test.
$G_{upstream}$ = Gasoline upstream factor = $0.25 * GHG_{target}$.

12.2.2 The Charge Depleting to Charge Sustaining Range ($R_{cdtcs}$) is the total number of cycles driven at least partially in charge depleting mode times the cycle distance. Cycles meets charge sustaining criterion are not included in the $R_{cdtcs}$. The $R_{cdtcs}$ includes the transitional cycle, where the vehicle may have operated in both depleting and sustaining modes.

12.2.3 The utility factors for urban and highway cycles are provided in the following table.

**Utility factors for each PHEV drive cycle test with charge-depletion operation**

| Test cycle number | Test cycle utility factor | |
|---|---|---|
| | Urban, $UF_i$ | Highway, $UF_i$ |
| 1 | 0.176 | 0.233 |
| 2 | 0.141 | 0.172 |
| 3 | 0.112 | 0.127 |
| 4 | 0.091 | 0.095 |
| 5 | 0.074 | 0.071 |
| 6 | 0.059 | 0.054 |
| 7 | 0.049 | 0.041 |
| 8 | 0.039 | 0.032 |
| 9 | 0.033 | 0.025 |
| 10 | 0.027 | 0.020 |
| 11 | 0.023 | 0.017 |
| 12 | 0.019 | 0.013 |

12.2.4 This charge-depleting GHG rate from electricity use in each test cycle is defined by the following equation:

$$GHG_{cd.AC.i} = GHG_{grid} * E_{cd.AC.i} \quad \text{(Eq. 3)}$$

Where,

$GHG_{cd.AC.i}$ = Rated GHG emissions for charge-depleting PHEV, in $gCO_2e$/mile
$E_{cd.AC.i}$ = Urban or highway charge depleting electricity use, in kWh/mile
$GHG_{grid}$ = Lifecycle California electricity GHG intensity, 270 $gCO_2e$/kWh



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12.2.5 The urban or highway charge depleting electricity use is defined by the following formula:

$$E_{cd.AC.i} = \frac{E_{cd.DC.i}}{\sum_{i=1}^{N} E_{cd.DC.i}} * E_{cd.AC.total} \quad \text{(Eq. 4)}$$

Where,

$N$ = Total number of test cycles in the charge depleting to charge sustaining range ($R_{cdtcs}$) of the urban or highway charge depleting test.

$E_{cd.AC.i}$ = AC kWh consumed in the "i"th cycle of the charge depleting test.

$E_{cd.DC.i}$ = Depleted DC energy for the "i"th cycle in the charge depleting test. It is defined in section F.3.4 of these test procedures.

$E_{cd.AC.total}$ = Charge-depleting net AC energy consumption is determined according to section F.3.4 of these test procedures.

12.2.6 The $Y_{cs.urban}$, which is the weighted $CO_2$ mass emissions of the charge-sustaining test, is determined by the following equation, which can be found in section F.5.5 of these test procedures.

$$Y_{CS.Urban} = 0.43 * \frac{Y_C}{D_C} + 0.57 * \frac{Y_H}{D_H} \quad \text{(Eq. 5)}$$

Where,

$Y_{CS.Urban}$ = Weighted mass emissions of $CO_2$ in grams/mi of the charge sustaining test.

$Y_C$ = Mass emissions as calculated from the cold start UDDS, in grams per cycle.

$Y_H$ = Mass emissions as calculated from the hot start UDDS, in grams per cycle.

$D_C$ = The measured driving distance from the cold start UDDS, in miles.

$D_H$ = The measured driving distance from the hot start UDDS, in miles.

12.3 The highway GHG emissions value for off-vehicle charge capable hybrid electric vehicles is calculated using the following equation.



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$$GHG_{highway} = \sum_{j=1}^{N_{highwayn}} (UF_j\}*(\frac{Y_{CD.j}}{D_j} + GHG_{cd.AC.j}) - \sum_{j=1}^{N_{highway}} (UF_i)*G_{upstream} + (1 - \sum_{j=1}^{N_{highway}} (UF_j))*(Y_{cs.highway})$$

(Eq. 7)

Where,

$GHG_{highway}$= Rated highway GHG emissions for PHEV, in $gCO_2e$/mile

$j$ = Number of charge-depleting highway test cycle

$N_{highway}$ = Total number of highway test cycles in charge depleting to charge sustaining range ($R_{cdtcs}$)

$UF_j$ = Utility factor for highway test cycle j (see Table 1)

$Y_{CD.j}$ = Mass emissions of $CO_2$ in grams per vehicle mile, for the "j"th test in the charge depleting test

$D_j$ = Distance of the HFEDS cycle, in miles.

$GHG_{cd.AC.j}$= Rated GHG emissions for test cycle $j$, in $gCO_2e$/mile (see Eq. 3)

$Y_{cs.highway}$ = Mass emissions of $CO_2$ in grams/mi of the highway charge sustaining emission test, which can be found in section F.6.3.3 of these test procedures.

$G_{upstream}$ = Gasoline upstream factor $0.25 * GHG_{tar}$

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Date of Release: December 7, 2011
Date of Board Hearing: January 26-27, 2012
Date of 15 day notice period: February 22, 2012

**Attachment C**

California Environmental Protection Agency
AIR RESOURCES BOARD

# PROPOSED 15-DAY MODIFICATIONS

## 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

Adopted: [insert date here]

[Note: This is a newly adopted incorporated test procedure. This document is printed in a style to indicate changes from the adopted incorporated test procedure. All original language is indicated by plain type. The 15-day proposed modifications are shown in single underline to indicate additions and ~~single strikeout~~ to indicate deletions. Existing intervening text that is not proposed to be amended is indicated by "* * * *".]



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Date of Release: December 7, 2011
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**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)

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**B. Definitions and Terminology.**

**1. Definitions.**

* * * * *

"**Conventional rounding method**" means to increase the last digit to be retained when the following digit is five or greater. Retain the last digit as is when the following digit is four or less.

"**Discounted PZEV and AT PZEV credits**" means credits earned under section 1962 and 1962.1 by delivery for sale of PZEVs and AT PZEVs, discounted according to subdivision C.7.2(f).

"**East Region pool**" means the combination of Section 177 states east of the Mississippi River.

* * * * *

"**Energy storage device**" means a storage device able to provide the minimum power and energy storage capability to enable engine stop/start capability, traction boost, regenerative braking, and (nominal) charge sustaining mode driving capability. In the case of TZEVs, a minimum range threshold relative to certified, new-vehicle range capability is not specified or required.

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"**Hydrogen fuel cell vehicle**" means a ZEV that is fueled primarily by hydrogen, but may also have off-vehicle charge capability.

"**Hydrogen internal combustion engine vehicle**" means a TZEV that is fueled exclusively by hydrogen.

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"**West Region pool**" means the combination of Section 177 states west of the Mississippi River.

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## C. Zero-Emission Vehicle Standards.

**1. ZEV Emission Standard.** The Executive Officer shall certify new 2018 and subsequent passenger cars, light-duty trucks and medium-duty vehicles as ZEVs if the vehicles produce zero exhaust emissions of any criteria pollutant (or precursor pollutant) or greenhouse gas, excluding emissions from air conditioning systems, under any and all possible operational modes and conditions.

### 2. Percentage ZEV Requirements

### 2.1 General Percentage ZEV Requirement.

(b) *Calculating the Number of Vehicles to Which the Percentage ZEV Requirement is Applied.* For 2018 and subsequent model years, a manufacturer's production volume for the given model year will be based on the three-year average of the manufacturer's volume of PCs and LDTs, produced and delivered for sale in California in the prior second, third, and fourth model year [for example, 2019 model year ZEV requirements will be based on California production volume average of PCs and LDTs for the 2015 to 2017 model years]. This production averaging is used to determine ZEV requirements only, and has no effect on a manufacturer's size determination (eg. three-year average calculation method). In applying the ZEV requirement, a PC or LDT, that is produced by one manufacturer (e.g., Manufacturer A), but is marketed in California by another manufacturer (e.g., Manufacturer B) under the other manufacturer's (Manufacturer B) nameplate, shall be treated as having been produced by the marketing manufacturer (i.e., Manufacturer B).

(1) *[Reserved]*

(2) *[Reserved]*

(3) A manufacturer may apply to the Executive Officer to be permitted to base its ZEV obligation on the number of PCs and LDTs, produced by the manufacturer and delivered for sale in California that same model year (ie, same model-year calculation method) as an alternative to the three-year averaging of prior year production described above, for up to two model years, total, between model year 2018 and model year 2025. For the same model-year calculation method to be allowed, a manufacturer's application to the Executive Officer must show that their volume of PCs and LDTs produced and delivered for sale in California has decreased by ~~40~~ at least 30 percent from the previous year due to circumstances that were unforeseeable and beyond their control.

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## 3. Transitional Zero Emission Vehicles (TZEV).

**3.1 Introduction**. This subdivision C.3 sets forth the criteria for identifying vehicles delivered for sale in California as TZEVs.

**3.2 TZEV Requirements**. In order for a vehicle to be eligible to receive a ZEV allowance, the manufacturer must demonstrate compliance with all of the following requirements:

(a) *SULEV Standards.* Certify the vehicle to the 150,000-mile SULEV 20 or 30 exhaust emission standards for PCs and LDTs in subdivision 1961.2(a)(1). Bi-fuel, fuel flexible and dual-fuel vehicles must certify to the applicable 150,000-mile SULEV 20 or 30 exhaust emission standards when operating on both fuels. Manufacturers may certify 2018 and 2019 TZEVs to the 150,000-mile SULEV exhaust emission standards for PCs and LDTs in subdivision 1961(a)(1);

(b) *Evaporative Emissions.* Certify the vehicle to the evaporative emission standards in subdivision 1976(b)(1)(G) . Manufacturers may certify 2018 and 2019 TZEVs to the evaporative standards for PCs and LDTs in subdivision 1976(b)(1)(E);

* * * * *

**3.3 Allowances for TZEVs**.

(a) *Zero Emission Vehicle Miles Traveled TZEV Allowance Calculation.* A vehicle that meets the requirements of subdivision C.3.2 and has zero-emission vehicle miles traveled (VMT), as defined by and calculated by this test procedure and measured as ~~all electric $R_{cda}$.~~ equivalent all electric range (EAER) capability will generate allowance according to the following equation:

| *UDDS Test Cycle Range ($R_{cda}$)* | *Allowance* |
|---|---|
| <10 all electric miles | 0.00 |
| ≥10 all electric miles | TZEV Credit = [(0.01) * ~~$R_{cda}$~~EAER + 0.30] |
| >80 miles (credit cap) | 1.~~3~~10 |

(1) Allowance for US06 Capability. TZEVs with US06 all electric range capability (~~$R_{cda}$~~AER) of at least 10 miles shall earn an additional 0.2 allowance. US06 test cycle range capability shall be determined in accordance with section E.8 of these test procedures.

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**4. Qualification for Credits From ZEVs.**

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**4.5 Credits for 2018 and Subsequent Model Years.**

(a) *ZEV Credit Calculations*. Credits from a ZEV delivered for sale are based on the ZEV's UDDS all electric range, determined in accordance with these test procedures using the following equation:

ZEV Credit = (0.01) * (UDDS range) + 0.5<u>0</u>

* * * * *

(e) *Counting Specified ZEVs Placed in Service in a Section 177 State and in California.*

<u>(1) *Provisions for 2018 through 2025 Model Years.* Large volume manufacturers and intermediate volume manufacturers with credits earned from h~~H~~ydrogen fuel cell vehicles that are certified to the California ZEV standards applicable for the ZEV's model year, delivered for sale and placed in service in California or in a section 177 state, may be counted towards compliance in California and in all section 177 states with the percentage ZEV requirements in subdivision C.2. The credits earned are multiplied by the ratio of a manufacturer's applicable production volume for a model year, as specified in subdivision C.2.1(b), in the state receiving credit to the manufacturer's applicable production volume as specified in subdivision C.2.1(b), for the same model year in California(hereafter, "proportional value"). Credits generated from ZEV placement in a section 177 state will be earned at the proportional value in the section 177 state, and earned in California at the full value specified in subdivision C.4.5(a).</u>

<u>(2) *Optional Section 177 State Compliance Path.*</u>

<u>(A) *Reduced ZEV and TZEV Percentages.* Large volume manufacturers and intermediate volume manufacturers that have fully complied with the optional section 177 state compliance path requirements in subdivision 1962.1(d)(5)(E)3. are allowed to meet ZEV percentage requirements and optional TZEV percentages reduced from the minimum ZEV floor percentages and TZEV percentages in subdivision C.2.2(e) in each section 177 state equal to the following percentages of their sales volume determined under subdivision 1962.2(b)(1)(B:</u>

**<u>ZEVs</u>**

| <u>Model Year</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> | <u>2021</u> |
|---|---|---|---|---|
| <u>Existing Minimum ZEV Floor</u> | <u>2.00%</u> | <u>4.00%</u> | <u>6.00%</u> | <u>8.00%</u> |



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| | | | | |
|---|---|---|---|---|
| Section 177 State Adjustment for Optional Compliance Path | 62.5% | 75% | 87.5% | 100% |
| Minimum Section 177 State ZEV Requirement | 1.25% | 3.00% | 5.25% | 8.00% |

**TZEVs**

| Model Year | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|
| Existing TZEV Percentage | 2.50% | 3.00% | 3.50% | 4.00% |
| Section 177 State Adjustment for Optional Compliance Path | 90.00% | 100% | 100% | 100% |
| New Section 177 State TZEV Percentage | 2.25% | 3.00% | 3.50% | 4.00% |

**Total Percent Requirement**

| Model Year | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|
| New Total Section 177 State Optional Requirements | 3.50% | 6.00% | 8.75% | 12.00% |

1. *Trading and Transferring ZEV and TZEV Credits within West Region Pool and East Region Pool.* Manufacturers that have fully complied with the optional section 177 state compliance path requirements in subdivision 1962.1(d)(5)(E)3. may trade or transfer specified model year ZEV and TZEV credits within the West Region pool to meet the same model year requirements in subdivision C.4.5(e)(2)(A) and will incur no premium on their credit values. For example, for a manufacturer to make up a 2019 model year shortfall of 100 credits in State X, the manufacturer may transfer 100 (2019 model year) ZEV credits from State Y, within the West Region pool. Manufacturers that have fully complied with the optional section 177 state compliance path requirements in subdivision 1962.1(d)(5)(E)3. may trade or transfer specified model year ZEV and TZEV credits within the East Region pool to meet the same model year requirements in subdivision C.4.5(e)(2)(A), and will incur no premium on their credit values. For example, for a manufacturer to make up a 2019 model year shortfall of 100 credits in State W, the manufacturer may transfer 100 (2019 model year) ZEV credits from State Z, within the East Region pool.

2. *Trading and Transferring ZEV and TZEV Credits between the West Region Pool and the East Region Pool.* Manufacturers that have fully complied with the optional section 177 state compliance path requirements in subdivision 1962.1(d)(5)(E)3. may trade or transfer specified model year ZEV and TZEV credits to meet the same model year requirements in subdivision

C.4.5(e)(2)(A).a. between the West Region pool and the East Region pool; however, any credits traded will incur a premium of 30% of their value. For example, in order for a manufacturer to make up a 2019 model year shortfall of 100 credits in the West Region Pool, the manufacturer may transfer 130 (2019 model year) credits from the East Region Pool. No credits may be traded or transferred to the East Region pool or West Region pool from a manufacturer's California ZEV bank, or from the East Region pool or West Region pool to a manufacturer's California ZEV bank.

(B) *Reporting Requirements.* On an annual basis, by May 1st of the calendar year following the close of a model year, each manufacturer that elects the optional section 177 state compliance path under subdivision 1962.1(d)(5)(E)3 shall submit, in writing, to the Executive Officer and each section 177 state a report, including an itemized list, that indicates where vehicles have been placed within the East Region pool and within the West Region pool. The itemized list shall include the following:

1. The manufacturer's total applicable volume of PCs and LDTs delivered for sale in each section 177 state within the regional pool, as determined under subdivision C.2.1(b).

2. Make, model, vehicle identification number, credit earned, and section 177 state where delivery for sale of each TZEV and ZEV occurred and to meet manufacturer's requirements under subdivision C.4.5(e)(2)(A).

(C) *Failure to Meet Optional Section 177 State Compliance Path Requirements.* A manufacturer that elects the optional section 177 state compliance path subdivision 1962.1(d)(5)(E)3 and does not meet the modified percentages in subdivision C.4.5(e)(2)(A) in a model year or make up their deficit within the specified time and with the specified credits allowed by subdivision C.7.7(a) in all section 177 states of the applicable pool, shall be treated as subject to the ZEV percentage requirements in section C.2 in each section 177 state. The pooling provisions in subdivision C.4.5(e)(2)(A) shall not apply. Any transfers of ZEV or TZEV credits between section 177 states will be null and void if a manufacturer fails to comply, and ZEV or TZEV credits will return to the section 177 state in which the credits were earned. Penalties shall be calculated separately by each section 177 state where a manufacturer fails to make up the ZEV deficits by the end of the 2018 model year.

(D) The provisions of section C shall apply to a manufacturer electing the optional section 177 state compliance path, except as specifically modified by this subdivision C.4.5(e)(2).

* * * * *

(g) *BEVx.* A BEVx must meet the following in order to receive credit, based on its zero emission UDDS range, through subdivision C.4.5(a):

* * * * *

(3) *Minimum Zero Emission Range Requirements.* BEVxs must have a minimum of ~~80~~75 miles UDDS zero emission range.

* * * * *

**7. Generation and Use of ZEV Credits; Calculation of Penalties**

* * * * *

**7.2 ZEV Credit Calculations.**

(a) *Credits from ZEVs*. The amount of credits earned by a manufacturer in a given model year from ZEVs shall be expressed in units of credits, and shall be equal to the number of credits from ZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements, or, if applicable, requirements specified under subdivision C.4.5(e)(2)(A) for the model year subtracted from the number of ZEVs produced and delivered for sale in California by the manufacturer in the model year.

(b) *Credits from TZEVs.* The amount of credits earned by a manufacturer in a given model year from TZEVs shall be expressed in units of credits, and shall be equal to the total number of TZEVs produced and delivered for sale in California that the manufacturer applies towards meeting its ZEV requirement, or, if applicable, requirements specified under subdivision C.4.5(e)(2)(A) for the model year subtracted from the total number of ZEV allowances from TZEVs produced and delivered for sale in California by the manufacturer in the model year.

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**7.5 ZEV Credits for Transportation Systems**.

* * * * *

(c) *Cap on Use of Transportation System Credits.*

(1) *ZEVs.* Transportation system credits earned or allocated by ZEVs or BEVxs pursuant to subdivision 1962.1 (g)(5), not including any credits earned by the vehicle itself, may be used to satisfy up to one-tenth of a manufacturer's ZEV obligation in any given model year, and may be used to satisfy up to one-tenth of a manufacturer's

ZEV obligation which must be met with ZEVs, as specified in subdivision C.2.2(e) , or, if applicable, requirements specified under subdivision C.4.5(e)(2)(A). ~~Manufacturers may not use transportation system credits earned by ZEVs to comply with requirements specified in subdivision C.4.5(f).~~

(2) *TZEVs*. Transportation system credits earned or allocated by TZEVs pursuant to subdivision 1962.1(g)(5), not including all credits earned by the vehicle itself, may be used to satisfy up to one-tenth of the portion of a manufacturer's ZEV obligation that may be met with TZEVs or, if applicable, the portion of a manufacturer's obligation that may be met with TZEVs specified under subdivision C.4.5(e)(2)(A) in any given model year, but may only be used in the same manner as other credits earned by vehicles of that category. ~~Manufacturers may not use transportation system credits earned by TZEVs to comply with requirements specified in subdivision C.4.5(f).~~

**7.6 Use of ZEV Credits**. A manufacturer may meet the ZEV requirements in a given model year by submitting to the Executive Officer a commensurate amount of ZEV credits, consistent with subdivision C.2. Credits in each of the categories may be used to meet the requirement for that category as well as the requirements for lesser credit earning ZEV categories, but shall not be used to meet the requirement for a greater credit earning ZEV category, except for discounted PZEV and AT PZEV credits. For example, credits produced from TZEVs may be used to comply with the portion of the requirement that may be met with credits from TZEV, but not with the portion that must be satisfied with credits from ZEVs. These credits may be earned previously by the manufacturer or acquired from another party.

(a) *Use of Discounted PZEV and AT PZEV Credits and NEV Credits* For model years 2018 through 2025, discounted PZEV and AT PZEV credits, and NEV credits may be used to satisfy up to one-quarter of the portion of a manufacturer's requirement that can be met with credits from TZEVs or, if applicable, the portion of a manufacturer's obligation that may be met with TZEVs specified under subdivision C.4.5(e)(2)(A). Intermediate volume manufacturers may fulfill their entire requirement with discounted PZEV and AT PZEV credits, and NEV credits in model years 2018 and 2019. These credits may be earned previously by the manufacturer or acquired from another party. Discounted PZEV and AT PZEV credits may no longer be used after model year 2025 compliance.

(b) *Use of BEVx Credits.* BEVx credits may be used to satisfy up to 50% of the portion of a manufacturer's requirement that must be met with ZEV credits.

(c) *GHG-ZEV Over Compliance Credits.*

(1) *Application***.** Manufacturers may apply to the Executive Officer, no later than ~~May 1, 2018~~December 31, 2016, to be eligible for this subdivision C.7.6(c), based on the following qualifications:

* * * * *

(2) *Credit Generation and Calculation.* Manufacturers must calculate their over compliance with section 1961.3 requirements for model years 2018 through 2021 based on compliance with the previous model year standard. For example, to generate credits for this subdivision C.7.6(c) for model year 2018, manufacturers would calculate credits based on model year 2017 compliance with section 1961.3.

* * * * *

(B) Credits earned under section 1961.3(~~b~~a)(9) may not be included in the calculation of $gCO_2$/mile credits for use in the above equation in subdivision (A).

* * * * *

(3) *Use of GHG-ZEV Over Compliance Credits*. A manufacturer may use no more than the percentage enumerated in the table below to meet either the total ZEV requirement nor the portion of their ZEV requirement that must be met with ZEV credits, with credits earned under this subdivision C.7.6(c).

| 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|
| 50% | 50% | 40% | 30% |

Credits earned in any given model year under this subdivision C.7.6(c) may only be used in the applicable model year and may not be used in any other model year.

Credits calculated under this provision must also be removed from the GHG compliance bank, and cannot be banked for future compliance toward section 1961.3.

**~~4. Reporting Requirements.~~**

(4) *Reporting Requirements.* Annually, manufacturers are required to submit calculations of credits for this subdivision C.7.6(c) for the model year, any remaining credits/debits from previous model years under 1961.3, and projected credits/debits for future years through 2021 under 1961.3 and this subdivision C.7.6(c).

**~~a.~~** If a manufacturer, who has been granted the ability to generate credits under this subdivision C.7.6(c), fails to over comply by at least 2.0 $gCO_2$/mile in any one year, the manufacturer will be subject to the full ZEV requirements for the model year and future model years, and will not be able to earn credits for any other model year under this subdivision C.7.6(c).

(5) If the Executive Officer does not make a determination that a Federal greenhouse gas fleet standard is functionally equivalent to subdivision 1961.3, than this subdivision C.7.6(c)(1) through (4) is unavailable for use by any manufacturer.

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**F. Test Procedures for 2012~~8~~ and Subsequent Model Zero-Emission Vehicles (including Fuel Cell Vehicles and Hybrid Fuel Cell Vehicles) and All 2012 and Subsequent Model Hybrid-Electric Vehicles, Except Off-Vehicle Charge Capable Hybrid Electric Vehicles.**

The "as adopted or amended dates" of the 40 CFR Part 86 regulations referenced by this document are the dates identified in the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles." Unless otherwise noted, these requirements shall apply to all ZEVs (including fuel cell vehicles and hybrid fuel cell vehicles) and all HEVs, except off-vehicle charge capable HEVs. ~~A manufacturer may elect to certify a 2009, 2010, or 2011 model-year zero-emission vehicle or hybrid electric vehicle, except an off-vehicle charge capable hybrid electric vehicle, using this section E.~~

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**G. Test Procedures for 2012~~8~~ and Subsequent Model Off-Vehicle Charge Capable Hybrid Electric Vehicles.**

The "as adopted or amended dates" of the 40 CFR Part 86 regulations referenced by this document are the dates identified in the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," unless otherwise noted. ~~A manufacturer may elect to certify a 2009, 2010, or 2011 model-year off-vehicle charge capable hybrid electric vehicle using this section G.~~

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~~**J. Test Procedures for 2009 through 2011 Model Zero-Emission Vehicles and Hybrid-Electric Vehicles.**~~

~~The "as adopted or amended dates" of the 40 CFR Part 86 regulations referenced by this document are the dates identified in the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles."~~

~~**1. Electric Dynamometer.** All ZEVs must be tested using a 48-inch single roll electric dynamometer meeting the requirements of 40 CFR Subpart B, §86.108-00(b)(2).~~

~~**2. Vehicle and Battery Break-In Period.** A manufacturer shall use good~~

engineering judgment in determining the proper stabilized emissions mileage test point and report same according to the requirements of section D.2.11 above.

**3. All-Electric Range Test.** All 2009 through 2011 ZEVs and only off-vehicle charge capable hybrid electric vehicles shall be subject to the All-Electric Range Test specified below for the purpose of determining the energy efficiency and operating range of a ZEV or of an off-vehicle charge capable hybrid electric vehicle operating without the use of its auxiliary power unit. For hybrid electric vehicles, the manufacturer may elect to conduct the All-Electric Range Test prior to vehicle preconditioning in the exhaust and evaporative emission test sequence specified in the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles".

3.1 **Cold soak**. The vehicle shall be stored at an ambient temperature not less than 68°F (20°C) and not more than 86°F (30°C) for 12 to 36 hours. During this time, the vehicle's battery shall be charged to a full state-of-charge.

3.2 **Driving schedule.**

3.2.1 **Determination of Urban All-Electric Range.**

(a) At the end of the cold soak period, the vehicle shall be placed, either driven or pushed, onto a dynamometer and operated through successive Urban Dynamometer Driving Schedules (UDDS), 40 CFR, Part 86, Appendix I, which is incorporated herein by reference. A 10-minute soak shall follow each UDDS cycle.

(b) For vehicles with a maximum speed greater than or equal to the maximum speed on the UDDS cycle, this test sequence shall be repeated until the vehicle is no longer able to maintain either the speed or time tolerances in 40 CFR §86.115-00 (b)(1) and (2), or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc. For off-vehicle charge capable hybrid electric vehicles, this determination shall be performed without the use of the auxiliary power unit.

(c) For vehicles with a maximum speed less than the maximum speed on the UDDS cycle, the vehicle shall be operated at maximum available power (or full throttle) when the vehicle cannot achieve the speed trace within the speed and time tolerances specified in 40 CFR § 86.115-00(b)(1) and (2). The test shall be terminated when the vehicle speed when operated at maximum available power (or full throttle) falls below 95 percent of the maximum speed initially achieved on the UDDS cycle or when the battery state-of-charge is depleted to the lowest level allowed by the manufacturer, or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc., whichever occurs first. For off-vehicle charge capable hybrid electric vehicles, this determination shall be performed without the use of the auxiliary power unit.

3.2.2 **Determination of Highway All-Electric Range.**

(a) At the end of the cold soak period, the vehicle shall be placed, either driven or pushed, onto a dynamometer and operated through two successive Highway Fuel Economy Driving Schedules (HFEDS), 40 CFR, Part 600, Appendix I, which is incorporated herein by reference. There shall be a 15 second zero speed with key on and brake depressed between two cycles and a 10-minute soak following the two HFEDS cycles.

(b) For vehicles with a maximum speed greater than or equal to the maximum speed on the HFEDS cycle, this test sequence shall be repeated until the vehicle is no longer able to maintain either the speed or time tolerances in 40 CFR § 86.115-00 (b)(1) and (2), or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc. For off-vehicle charge capable hybrid electric vehicles, this determination is optional and shall be performed without the use of the auxiliary power unit.

(c) For vehicles with a maximum speed less than the maximum speed on the HFEDS cycle, the vehicle shall be operated at maximum available power (or full throttle) when the vehicle cannot achieve the speed trace within the speed and time tolerances specified in 40 CFR § 86.115-00(b)(1) and (2). The test shall be terminated when the vehicle speed when operated at maximum available power (or full throttle) falls below 95 percent of the maximum speed initially achieved on the HFEDS cycle or when the battery state-of-charge is depleted to the lowest level allowed by the manufacturer, or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc., whichever occurs first. For off-vehicle charge capable hybrid electric vehicles, this determination shall be performed without the use of the auxiliary power unit.

(d) NEVs are exempt from the highway all-electric range test.

3.2.3 **Recording requirements.** Once the vehicle is no longer able to maintain the speed and time requirements specified in (2) above, or once the auxiliary power unit turns on, in the case of an off-vehicle charge capable hybrid electric vehicle, the vehicle shall be brought to an immediate stop and the following data recorded:

(a) mileage accumulated during the All-Electric Range Test;
(b) Net DC energy from the battery that was expended during the All-Electric Range Test (may be reported as the total DC battery energy output and the total DC battery energy input during the All-Electric Range Test);
(c) AC energy required to fully charge the battery after the All-Electric Range Test from the point where electricity is introduced from the electric outlet to the battery charger; and
(d) DC energy required to fully charge the battery after the All-Electric Range



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Test from the point where electricity is introduced from the battery charger to the battery.

Battery charging shall begin within 1 hour after terminating the All-Electric Range Test.

3.2.4 **Regenerative braking**. Regenerative braking systems may be utilized during the range test. The braking level, if adjustable, shall be set according to the manufacturer's specifications prior to the commencement of the test. The driving schedule speed and time tolerances specified in (2) shall not be exceeded due to the operation of the regenerative braking system.

**4. Determination of Battery Specific Energy for ZEVs.**

Determine the specific energy of batteries used to power a ZEV in accordance with the U.S. Advanced Battery Consortium's Electric Vehicle Battery Procedure Manual (January 1996), Procedure No. 2, "Constant Current Discharge Test Series," using the C/3 rate. The weight calculation must reflect a completely functional battery system as defined in the Appendix of the Manual, including pack(s), required support ancillaries (e.g., thermal management), and electronic controller.

**5. Determination of the Emissions of the Fuel-fired Heater for Vehicles Other Than ZEVs.**

The exhaust emissions result of the fuel-fired heater shall be determined by operating at a maximum heating capacity with a cold start between 68$^{o}$F and 86$^{o}$F for a period of 20 minutes and dividing the grams of emissions by 20. The resulting grams per minute shall be multiplied by 3.0 minutes per mile for a grams per mile value.

**6. Hybrid Electric Vehicle FTP Emission Test Provisions.**

Alternative procedures may be used if shown to yield equivalent results and if approved in advance by the Executive Officer of the Air Resources Board.

**6.1 Vehicle Preconditioning.**

To be conducted pursuant to the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles" with the following supplemental requirements:

6.1.1 Battery state-of-charge shall be set prior to initial fuel drain and fill before vehicle preconditioning.

6.1.2 For hybrid electric vehicles that do not allow manual activation of the auxiliary power unit, battery state-of-charge shall be set at a level that causes the hybrid

~~electric vehicle to operate the auxiliary power unit for the maximum possible cumulative amount of time during the preconditioning drive.~~

~~6.1.3 For hybrid electric vehicles that allow manual activation of the auxiliary power unit, battery state-of-charge shall be set at a level that satisfies one of the following conditions:~~

~~(i) If the hybrid electric vehicle is charge-sustaining over the UDDS, battery state-of-charge shall be set at the lowest level allowed by the manufacturer.~~

~~(ii) If the hybrid electric vehicle is charge-depleting over the UDDS, battery state-of-charge shall be set at the level recommended by the manufacturer for activating the auxiliary power unit when operating in urban driving conditions.~~

~~6.1.4 After setting battery state-of-charge, the hybrid electric vehicle shall be pushed or towed to a work area for fuel drain and fill according to sections D.1.1. and D.1.2. of the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles".~~

~~6.1.5 Following fuel drain and fill, the vehicle shall be pushed or towed into position on a dynamometer and preconditioned. If the auxiliary power unit is capable of being manually activated, the auxiliary power unit shall be manually activated at the beginning of and operated throughout the preconditioning drive.~~

~~6.1.6 Within five minutes of completing preconditioning drive, battery state-of-charge shall be set at a level that satisfies one of the following conditions:~~

~~(i) If the hybrid electric vehicle does not allow manual activation of the auxiliary power unit and is charge-sustaining over the UDDS, then set battery state-of-charge to a level such that the SOC Criterion (see section B., Definitions, of these procedures) would be satisfied for the dynamometer procedure (section 6.2 of these procedures). If off-vehicle charging is required to increase battery state-of-charge for proper setting, off-vehicle charging shall occur during 12 to 36 hour soak period.~~

~~(ii) If the hybrid electric vehicle does not allow manual activation of the auxiliary power unit and is charge-depleting over the UDDS, then no battery state-of-charge adjustment is permissible.~~

~~(iii) If the hybrid electric vehicle does allow manual activation of the auxiliary power unit, then set battery state-of-charge to manufacturer recommended level for activating the auxiliary power unit when the hybrid electric vehicle is operating in urban driving conditions.~~

**6.2 Dynamometer Procedure**

To be conducted pursuant to 40 CFR § 86.135-00 with the following revisions:

6.2.1 Amend subparagraph (a): Overview. The dynamometer run consists of two tests, a "cold" start test, after a minimum 12-hour and a maximum 36-hour soak pursuant to the provisions of the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles", and a "hot" start test following the "cold" start test by 10 minutes. Vehicle startup (with all accessories turned off), operation over the UDDS and vehicle shutdown make a complete cold start test. Vehicle startup and operation over the UDDS and vehicle shutdown make a complete hot start test. The exhaust emissions are diluted with ambient air in the dilution tunnel as shown in Figure B94-5 and Figure B94-6. A dilution tunnel is not required for testing vehicles waived from the requirement to measure particulates. Four particulate samples are collected on filters for weighing; the first sample plus backup is collected during the cold start test (including shutdown); the second sample plus backup is collected during the hot start test (including shutdown). Continuous proportional samples of gaseous emissions are collected for analysis during each test. For hybrid electric vehicles with gasoline-fueled, natural gas-fueled and liquefied petroleum gas-fueled Otto-cycle auxiliary power units, the composite samples collected in bags are analyzed for THC, CO, $CO_2$, $CH_4$ and $NO_x$. For hybrid electric vehicles with petroleum-fueled diesel-cycle auxiliary power units (optional for natural gas-fueled, liquefied petroleum gas-fueled and methanol-fueled diesel-cycle vehicles), THC is sampled and analyzed continuously pursuant to the provisions of § 86.110. Parallel samples of the dilution air are similarly analyzed for THC, CO, $CO_2$, $CH_4$ and $NO_x$. For hybrid electric vehicles with natural gas-fueled, liquefied petroleum gas-fueled and methanol-fueled auxiliary power units, bag samples are collected and analyzed for THC (if not sampled continuously), CO, $CO_2$, $CH_4$ and $NO_x$. For hybrid electric vehicles with methanol-fueled auxiliary power units, methanol and formaldehyde samples are taken for both exhaust emissions and dilution air (a single dilution air formaldehyde sample, covering the total test period may be collected). Parallel bag samples of dilution air are analyzed for THC, CO, $CO_2$, $CH_4$ and $NO_x$.

6.2.2 Subparagraph (d). [No change.]

6.2.3 Amend subparagraph (h): The driving distance, as measured by counting the number of dynamometer roll or shaft revolutions, shall be determined for the cold start test and hot start test. The revolutions shall be measured on the same roll or shaft used for measuring the vehicle's speed.



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### 6.3 Dynamometer Test Run, Gaseous and Particulate Emissions

To be conducted pursuant to 40 CFR § 86.137-96 with the following revisions:

6.3.1 Amend subparagraph (a): General. The dynamometer run consists of two tests, a cold start test, after a minimum 12-hour and a maximum 36-hour soak pursuant to the provisions of the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles" and a hot start test following the cold start test by 10 minutes. The vehicle shall be stored prior to the emission test in such a manner that precipitation (e.g., rain or dew) does not occur on the vehicle. The complete dynamometer test consists of a cold start drive of 7.5 miles (12.1 km) and a hot start drive of 7.5 miles (12.1 km). The vehicle is allowed to stand on the dynamometer during the 10 minute time period between the cold and hot start tests.

6.3.2 Amend subparagraph (b)(9): Start the gas flow measuring device, position the sample selector valves to direct the sample flow into the exhaust sample bag, the methanol exhaust sample, the formaldehyde exhaust sample, the dilution air sample bag, the methanol dilution air sample and the formaldehyde dilution air sample (turn on the petroleum-fueled diesel-cycle THC analyzer system integrator, mark the recorder chart, start particulate sample pump No. 1, and record both gas meter or flow measurement instrument readings, if applicable), and turn the key on. If the auxiliary power unit is capable of being manually activated, the auxiliary power unit shall be activated at the beginning of and operated throughout the UDDS.

6.3.2 Delete subparagraph (13).

6.3.3 Amend subparagraph (14): Turn the vehicle off 2 seconds after the end of the last deceleration (at 1,369 seconds).

6.3.4 Amend subparagraph (15): Five seconds after the vehicle is shutdown, simultaneously turn off gas flow measuring device No. 1 and if applicable, turn off the hydrocarbon integrator No. 1, mark the hydrocarbon recorder chart, turn off the No. 1 particulate sample pump and close the valves isolating particulate filter No. 1, and position the sample selector valves to the "standby" position. Record the measured roll or shaft revolutions (both gas meter or flow measurement instrumentation readings), and reset the counter. As soon as possible, transfer the exhaust and dilution air samples to the analytical system and process the samples pursuant to § 86.140, obtaining a stabilized reading of the exhaust bag sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample period. (If it is not possible to perform analysis on the methanol and formaldehyde samples



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within 24 hours, the samples should be stored in a dark cold (4□C to 10□C) environment until analysis. The samples should be analyzed within fourteen days.) If applicable, carefully remove both pairs of particulate sample filters from their respective holders, and place each in a separate petri dish, and cover.

6.3.3 Amend subparagraph (18): Repeat the steps in paragraphs (b)(2) through (b)(17) of this section for the hot start test. The step in paragraph (b)(9) of this section shall begin between 9 and 11 minutes after the end of the sample period for the cold start test.

6.3.4 Delete subparagraph (19).

6.3.5 Delete subparagraph (20).

6.3.6 Amend subparagraph (21): As soon as possible, and in no case longer than one hour after the end of the hot start phase of the test, transfer the four particulate filters to the weighing chamber for post-test conditioning, if applicable. For hybrid electric vehicles that do not allow manual activation of the auxiliary power unit and are charge-sustaining over the UDDS, a valid test shall satisfy the SOC Criterion (see Definitions, section B of these procedures).

6.3.7 Amend subparagraph (24): Vehicles to be tested for evaporative emissions will proceed pursuant to the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles".

**6.4 Calculations - Exhaust Emissions**

To be conducted pursuant to 40 CFR §86.144-94 with the following revisions:

6.4.1 Amend subparagraph (a): For light-duty vehicles and light duty trucks:

$$\frac{Y_{wm} = 0.43 * Y_c + 0.57 * Y_h}{\overline{D_c} \qquad \overline{D_h}}$$

Where:

(1) $Y_{wm}$ = Weighted mass emissions of each pollutant, i.e., THC, CO, THCE, NMHC, NMHCE, $CH_4$, $NO_x$, or $CO_2$, in grams per vehicle mile.

(2) $Y_c$ = Mass emissions as calculated from the cold start test, in grams per test.

(3) $Y_h$ = Mass emissions as calculated from the hot start test, in grams per test.

(4) $D_c$ = The measured driving distance from the cold start test, in



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miles.

(5) $D_h$ = The measured driving distance from the hot start test, in miles.

**6.5 Calculations - Particulate Emissions**

To be conducted pursuant to 40 CFR §86.145-82 with the following revisions:

6.5.1 Amend subparagraph (a): The final reported test results for the mass particulate ($M_p$) in grams/mile shall be computed as follows:

$$M_p = \frac{0.43 * M_{pc}}{D_c} + \frac{0.57 * M_{ph}}{D_h}$$

Where:

(1) $M_{pc}$ = Mass of particulate determined from the cold start test, in grams per vehicle mile. (See § 86.110-94 for determination.)

(2) $M_{ph}$ = Mass of particulate determined from the hot start test, in grams per vehicle mile. (See § 86.110-94 for determination.)

(3) $D_c$ = The measured driving distance from the cold start test, in miles.

(4) $D_h$ = The measured driving distance from the hot start test, in miles.

**7. Hybrid Electric Vehicle Highway Emission Test Provisions**

To be conducted pursuant to 40 CFR § 600.111-93 with the following revisions:

7.1 Amend subparagraph (b)(2): The highway fuel economy test is designated to simulate non-metropolitan driving with an average speed of 48.6 mph and a maximum speed of 60 mph. The cycle is 10.2 miles long with 0.2 stop per mile and consists of warmed-up vehicle operation on a chassis dynamometer through a specified driving cycle. A proportional part of the diluted exhaust emission is collected continuously for subsequent analysis of THC, CO, $CO_2$, and $NO_x$ using a constant volume (variable dilution) sampler. Diesel dilute exhaust is continuously analyzed for hydrocarbons using a heated sample line and analyzer. Methanol and formaldehyde samples are collected and individually analyzed for methanol-fueled vehicles.

7.2 Amend subparagraph (f)(3): Only one exhaust sample and one background sample are collected and analyzed for THC (except diesel hydrocarbons which are analyzed continuously), CO, $CO_2$, and $NO_x$. Methanol and formaldehyde samples (exhaust and dilution air) are collected and analyzed for methanol-fueled vehicles.



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7.3 Add subparagraph (f)(5): Battery state-of-charge shall be set prior to performing the HFEDS preconditioning cycle. For hybrid electric vehicles that do not allow manual activation of the auxiliary power unit, battery state-of-charge shall be set at a level that causes the hybrid electric vehicle to operate the auxiliary power unit for the maximum possible cumulative amount of time during the HFEDS preconditioning cycle. For hybrid electric vehicles that allow manual activation of the auxiliary power unit, battery state-of-charge shall be set at a level that satisfies one of the following conditions:

(i) If the hybrid electric vehicle is charge-sustaining over the HFEDS, battery state-of-charge shall be set at the lowest level allowed by the manufacturer.

(ii) If the hybrid electric vehicle is charge-depleting over the HFEDs, battery state-of-charge shall be set at the level recommended by the manufacturer for activating the auxiliary power unit when operating in highway driving conditions.

7.4 Amend subparagraph (h)(5): Operate the vehicle over one HFEDS preconditioning cycle according to the dynamometer driving schedule specified in §600.109(b). If the auxiliary power unit is capable of being manually activated, the auxiliary power unit shall be manually activated at the beginning of and operated throughout the HFEDS preconditioning cycle.

7.5 Amend subparagraph (h)(6): When the vehicle reaches zero speed at the end of the HFEDS preconditioning cycle, the driver has 17 seconds to prepare for the HFEDS emission measurement cycle of the test. Reset and enable the roll revolution counter. During the idle period, one of the following conditions shall apply:

(i) For hybrid electric vehicles that do not allow the auxiliary power unit to be manually activated and are charge-sustaining over the HFEDS, the vehicle shall be momentarily turned off for 5 seconds and turned back on during the idle period. The battery state-of-charge shall be recorded after the hybrid electric vehicle has fully turned on.

(ii) For hybrid electric vehicles that do not allow the auxiliary power unit to be manually activated and are charge-depleting over the HFEDS, the vehicle shall remain turned on during the idle period.

(iii) For hybrid electric vehicles that allow the auxiliary power unit to be manually activated, the vehicle shall remain turned on with the auxiliary power unit operating during the idle period.

7.6 Add subparagraph (h)(9): At the conclusion of the HFEDS emission test,

~~one of the following conditions shall apply:~~

~~(i) For hybrid electric vehicles that do not allow the auxiliary power unit to be manually activated and are charge-sustaining over the HFEDS, record the battery state-of-charge to determine if the SOC Criterion (see Definitions, section B of these procedures) is satisfied. If the SOC Criterion is not satisfied, then repeat dynamometer test run from subparagraph (h)(6). A total of three highway emission tests shall be allowed to satisfy the SOC Criterion. Manufacturers may elect to repeat dynamometer test run from subparagraph (h)(6) if battery energy level increased significantly relative to the initial battery state-of-charge set at the beginning of the HFEDS emission test.~~

~~(ii) For hybrid electric vehicles that do not allow the auxiliary power unit to be manually activated and are charge-depleting over the HFEDS, the emission test is completed.~~

~~(iii) For hybrid electric vehicles that allow the auxiliary power unit to be manually activated, the emission test is completed.~~

**~~K~~J. Advanced Technology Demonstration Program data requirements.**

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