

Steve Douglas

Attached are the Alliance for Automotive Innovation comments on the proposed adoption of Emergency Vehicle Emission Regulations.



November 10, 2025

DELIVERED ELECTRONICALLY

Clerk of the Board
Air Resources Board
1001 I Street
Sacramento, CA 95814

Subject: Emergency Regulations – Permanent Adoption

Dear Board Members,

The Alliance for Automotive Innovation (Auto Innovators)¹ appreciates the opportunity to provide comments on the California Air Resources Board (CARB) proposal to permanently adopt the Emergency Vehicle Emissions (EVE) regulations² as part of the On-Road Heavy-Duty Engine and Vehicle Omnibus rulemaking.³ Our association and members are committed to working cooperatively and constructively with CARB to ensure vehicles developed and produced are efficient, clean, and affordable for all.

Auto Innovators understands and does not oppose the intent of the EVE regulations – to clarify the California Advanced Clean Cars (ACC) I⁴ and optionally the ACC II⁵ pathways identified in CARB MAC ECCD-2025-08⁶. We also recognize that the EVE regulations do not extend the zero-emission vehicle (ZEV) sales requirements in 13 CCR 1962.2 of the ACC I regulations, which sunset at the end of MY 2025. Thus, the EVE regulations should allow manufacturers to certify vehicles to CARB's Low

¹ Auto Innovators represents the full auto industry, including the manufacturers producing most vehicles sold in the U.S., equipment suppliers, battery producers, semiconductor makers, technology companies, and autonomous vehicle developers. Our mission is to work with policymakers to realize a cleaner, safer, and smarter transportation future and to maintain U.S. competitiveness in cutting-edge automotive technology. Representing approximately 5 percent of the country's GDP, responsible for supporting nearly 10 million jobs, and driving \$1 trillion in annual economic activity, the automotive industry is the nation's largest manufacturing sector. (www.autosinnovate.org).

² The proposed light- and medium-duty vehicle EVE Regulations are contained in Appendices A-3, A-4-1, A-4-2, and the supplemental Initial Statement of Reasons in Appendix G.

³ California Air Resources Board. (2025, September 23). *On-Road Heavy-Duty Engine and Vehicle Omnibus, Low Carbon Fuel Standard, and Emergency Vehicle Emissions Regulations*. <https://ww2.arb.ca.gov/rulemaking/2025/orhdomnibus>

⁴ California Air Resources Board. (2012). *Advanced Clean Cars Program: LEV III Greenhouse Gas Exhaust Emission Standards and Test Procedures*. Retrieved from <https://www.arb.ca.gov/regact/2012/leviiiighg2012/leviiiighg2012.htm>

⁵ California Air Resources Board. (2022, August 22). *Advanced Clean Cars II*. <https://ww2.arb.ca.gov/rulemaking/2022/advanced-clean-cars-ii>

⁶ California Air Resources Board. (2025, August 25). *Manufacturers advisory correspondence (MAC) ECCD-2025-08: Regulatory guidance for engine and vehicle certification in California*. <https://ww2.arb.ca.gov/sites/default/files/2025-08/MAC%20ECCD-2025-08.pdf>

Emission Vehicles (LEV) III regulations (adopted in 2012) or optionally to the LEV IV regulations (adopted in 2022 and subject to the bipartisan Congressional resolution of disapproval under the CRA). Of course, MAC ECCD-2025-08 still allows manufacturers to alternatively certify vehicles to U.S. EPA Tier 3⁷ (2026 model year (MY)) or Tier 4⁸ (2027 and subsequent MY), a fact the United States District Court for the Eastern District of California relied on in denying the plaintiff's motion for a preliminary injunction related to ACC II, Advanced Clean Trucks, and Omnibus.⁹

We would appreciate both clarity and certainty from this rulemaking. However, as noted in our comments to OAL, which we incorporate by attachment, the proposed EVE regulations provide neither clarity nor certainty as written. With appropriate modifications identified below and in the attachments to this letter, the EVE regulations could offer a clear path for new vehicle compliance.

However, CARB must first clarify that an automaker will not face enforcement action if it follows the EVE regulations the Board adopts or its MAC ECCD-2025-08 for certification to EPA standards. Second, while we provide specific changes to clarify and correct the regulations and test procedures to ensure a clear path for certification to LEV III or optionally LEV IV, additional review and coordination with CARB Staff will certainly be required.

Clarify Enforcement Action Will Not Be Taken if Complying with EVE Regulations or MAC ECCD-2025-08

We remain deeply concerned that CARB continues to indicate that ACC II is the only pathway available that does not risk enforcement action. Throughout the regulations and Appendix G, Initial Statement of Reasons (ISOR)¹⁰, CARB threatens manufacturers with enforcement action on vehicles that they certify under the proposed EVE regulations or U.S. Environmental Protection Agency (EPA) motor vehicle emission standards (allowed by CARB Manufacturers Advisory Correspondence (MAC) ECCD-2025-08). For example, the ISOR includes this warning on page 11:

*Regulated parties may choose to follow either the LEV IV...or the antecedent LEV III...
Regulated parties, however, assume the **risk of future enforcement action** if they choose to
certify only to the antecedent provisions..." (emphasis added)*

⁷ Control of Air Pollution from Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards, 79 Fed. Reg. 23414 (2014).

⁸ Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, 89 Fed. Reg. 27842 (April 18, 2024).

⁹ Order Granting in Part and Denying in Part Plaintiffs' Motion for Preliminary Injunction, *Daimler Truck North America, et al. v California Air Resources Board, et al.*, Case No. 2:25-cv-02255-DC-AC, E.D. Cal. (October 31, 2025)

¹⁰ California Air Resources Board. (2025). *Appendix G: Supplement to Initial Statement of Reasons—Proposed Emergency Vehicle Emissions Regulations Proposed Amendments to the On-Road Heavy-Duty Engine and Vehicle Omnibus, Low Carbon Fuel Standard Regulations, and to Permanently Adopt the Emergency Vehicle Emissions Regulations.*

As a result of such language, manufacturers are left with no secure pathway to certify except under the ACC II regulations, which federal law prohibits CARB from implementing or enforcing.

The EVE regulations only provide clarity and certainty if following them does not result in enforcement action. Consequently, we recommend CARB clarify that vehicles complying with the EVE regulations or EPA regulations (included in MAC ECCD-2025-08) will NOT face enforcement action.

If California prevails in its lawsuit over the Congressional Review Act (CRA)¹¹, it can revise its regulations to eliminate the LEV III certification pathway and rescind MAC ECCD-2025-08 for vehicle certifications going forward. However, as noted in our recommended changes in Attachment 2, CARB should allow appropriate lead time to prevent disrupting the California new vehicle market. If California prevails in its litigation, we recommend starting the updated regulations no sooner than the beginning of the second full model year.

Direct Staff to Work with Stakeholders on 15-Day Notice Changes

Vehicle regulations and test procedures are complex and require more than just a few weeks to develop and write, and more than a few weeks for stakeholders to review and identify changes and corrections that reflect the Board and staff's intent. In the past, CARB staff worked with stakeholders for a year or more developing, drafting, correcting, and refining regulations and test procedures. Even with this level of review, there have been times when the regulations contained errors that needed correction. Correcting these errors via enforcement discretion letters is time consuming for all stakeholders.

The EVE regulations will require corrections and clarifications. We understand that CARB Staff has identified changes to be included in Staff Proposed 15-Day Changes, and we have identified others in the attachments. For example, since this is the first time OEMs have simultaneous programs (ACC II, ACC I, EPA Tier 4), maintaining various fleet average and phase-in percentages should be reviewed. However, additional time to review and collaborate with CARB staff would improve the regulations, provide clarity, and ensure the regulations reflect the Board's intent to provide a clear pathway to certification and sale of new vehicles in California.

We recommend the Board direct the Executive Officer to work with stakeholders to include any additional changes to the regulations or the test procedures in a 15-Day Notice.

¹¹ *State of California, et al., v. United States of America, et al.*, (ND Cal., case no. 3:25-cv-04966).

Conclusion

We appreciate the intent of CARB and its staff to develop a clear path for certification of new vehicles in California. With the changes above, attached, and additional collaboration between CARB staff and stakeholders, we believe this intent can be met. We genuinely appreciate the opportunity to work collaboratively with CARB and staff on vehicle regulations as we have done for the past 35 years.

Sincerely,



Dan Bowerson
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Attachments

**ALLIANCE
FOR AUTOMOTIVE
INNOVATION**

Sep 27, 2025

OAL Reference Attorney
300 Capitol Mall, Suite 1250
Sacramento, CA 95814

Subject: Emergency Amendment and Adoption of Vehicle Emission Regulations

The Alliance for Automotive Innovation (Auto Innovators)¹ appreciates the opportunity to provide comments on the California Air Resources Board (CARB) proposed adoption of Emergency Amendment and Adoption of Vehicle Emissions Regulations (hereafter, “EVE regulations”).² Auto Innovators and our members have worked constructively and collaboratively with CARB and its staff for over 30 years, and to our knowledge, this is the first time CARB has attempted to adopt vehicle emission regulations via emergency rulemaking. While we agree that clarity is needed, the proposed EVE regulations do not provide this clarity. Moreover, the EVE regulations do not meet the statutory requirements for emergency rulemaking, nor do they meet Office of Administrative Law’s (OAL’s) requirements for regulatory clarity. As a result, we strongly recommend OAL disapprove the proposed EVE regulations.

On September 23, 2025, CARB provided notice that it is requesting to make these emergency regulations permanent. The notice establishes a comment period from September 26, 2025, through November 10, 2025, and a public hearing is scheduled for November 20, 2025. This normal rulemaking process further demonstrates there is no valid “emergency.” Regardless of the method of adoption, the proposed EVE regulations do not provide clarity and instead sow confusion and uncertainty into California’s certification process and its new vehicle market. In fact, the new text proposed by CARB appears to require manufacturers to guess as to what law is in place, with the threat of enforcement if the wrong choice is made. This confusion, compounded by various errors

¹ Auto Innovators represents the full auto industry, including the manufacturers producing most vehicles sold in the U.S., equipment suppliers, battery producers, semiconductor makers, technology companies, and autonomous vehicle developers. Our mission is to work with policymakers to realize a cleaner, safer, and smarter transportation future and to maintain U.S. competitiveness in cutting-edge automotive technology. Representing approximately 5 percent of the country’s GDP, responsible for supporting nearly 10 million jobs, and driving \$1 trillion in annual economic activity, the automotive industry is the nation’s largest manufacturing sector. (www.autosinnovate.org).

² OAL File Number 2025-0922-01E, Office of Administrative Law. *Emergency regulations under review*. Retrieved September 25, 2025, from https://oal.ca.gov/emergency_regulations/emergency_regulations_under_review/, and California Air Resources Board. (2025, September 12). *Emergency amendment and adoption of vehicle emissions regulations*. <https://ww2.arb.ca.gov/rulemaking/2025/emergencyvehemissions>

and inconsistencies, could limit customer access to new motor vehicles, disrupt California dealership operations, and harm our automotive members.

Background and History

The following brief timeline provides a summary of the activities that have led us to the current situation:

1. On November 30, 2022, OAL approved CARB's ACC II regulations that included both an updated ZEV mandate and LEV IV criteria emission regulations beginning with the 2026 model year (MY).³
2. In April 2024, EPA finalized its Multi-Pollutant regulations that included Tier 4 criteria emission standards starting in 2027 MY that are generally as or more stringent than the Tier 3 or LEV III regulations.⁴
3. In January 2025, EPA granted California a waiver of federal preemption for the ACC II regulations.⁵
4. In February 2025, EPA submitted the ACC II waiver to the U.S. Congress for review.
5. In May 2025, CARB issued Manufacturers Advisory Correspondence (MAC) ECCD-2025-03 stating they would continue to process applications for certification to ACC II regulations, but eliminating the 2026 MY ZEV sales mandate.⁶
6. In June 2025, the U.S. Congress passed and the President signed a resolution disapproving the ACC II waiver under the Congressional Review Act (CRA), making the ACC II ZEV and LEV IV regulations unenforceable.⁷
7. In August of 2025, CARB issues MAC ECCD-2025-08, allowing manufacturers to certify to ACC II, ACC I, or U.S. EPA's Tier 3 (for 2026 MY) or Tier 4 (for 2027 and subsequent MYs) regulations.⁸
8. On September 22, 2025, CARB filed emergency regulations that are the subject of this letter.

³ California Air Resources Board. (2022, August 22). *Advanced Clean Cars II*.

<https://ww2.arb.ca.gov/rulemaking/2022/advanced-clean-cars-ii>

⁴ *Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles*, 89 Fed. Reg. 27842 (April 18, 2024).

⁵ *California State Motor Vehicle and Engine Pollution Control Standards; Advanced Clean Cars II; Waiver of Preemption; Notice of Decision*, 90 Fed. Reg. 642 (Jan. 6, 2025)

⁶ California Air Resources Board. (2025, May 23). *Manufacturers advisory correspondence (MAC) ECCD-2025-03: Regulatory guidance for Advanced Clean Cars II Regulation (ACCII), Zero-Emission Powertrain Certification Regulation, Advanced Clean Trucks Regulation (ACT), Heavy-Duty Engine and Vehicle Omnibus Regulation, Zero-Emission Airport Shuttle Regulation, and the Heavy-Duty Vehicle and Engine Emission Warranty and Maintenance Provisions*.

⁷ *Providing congressional disapproval under chapter 8 of title 5, United States Code, of the rule submitted by the Environmental Protection Agency relating to "California State Motor Vehicle and Engine Pollution Control Standards; Advanced Clean Cars II; Waiver of Preemption; Notice of Decision,"* H.J. Res. 88, 119th Cong. (2025) (enacted)

⁸ California Air Resources Board. (2025, August 25). *Manufacturers advisory correspondence (MAC) ECCD-2025-08: Regulatory guidance for engine and vehicle certification in California*. <https://ww2.arb.ca.gov/sites/default/files/2025-08/MAC%20ECCD-2025-08.pdf>

9. On September 23, 2025, CARB issued a normal rulemaking package to adopt the emergency regulations proposed here.
10. Today, manufacturers are left to wonder what specifically is required to obtain a CARB executive order to sell vehicles in California.

Even before Congress and the President's action to revoke California's waiver of federal preemption over three months ago, Auto Innovators had reached out to CARB staff in good faith to discuss a path forward that would provide certainty and clarity to vehicle manufacturers for certifying and bringing new vehicles into California given this new, complex environment. Unfortunately, we have not received a response. Rather than meeting with the impacted industry to discuss a clear and workable path forward, CARB issued MAC ECCD-2025-03, which was later superseded by MAC ECCD 2025-08.

Now, without mentioning either MAC, CARB proposes to adopt emergency regulations that attempt to address the very issue that it sought to address with the MACs. It remains unclear whether the proposed EVE regulations (emergency or non-emergency adoption) are intended to supersede MAC ECCD-2025-08 or whether these regulations will live alongside MAC ECCD-2025-08. Moreover, all these regulatory actions are layered with language warning automakers that any guidance or rulemaking can be undone pending the outcome of legal actions over an unknown timeline, with the potential for retroactive enforcement and associated risk.

The proposed EVE regulations are unworkable and unnecessary. They add to, rather than eliminate, the uncertainty in the process of certifying and selling new vehicles in California. All of this is in the guise of protecting the environment, even though equally or more stringent federal standards will ensure new vehicles continue to meet demanding emission standards.

Despite the confusion and errors in the EVE regulations, Auto Innovators believes the intention behind the proposal is, at least in part, to reinstate LEV III criteria emissions regulations to preserve a California-specific certification requirement for criteria emission controls considering the CRA revoking California's authority to enforce ACC II. While reinstating LEV III may be the intent of the proposed EVE regulations, they fail to accomplish that goal in a clear unambiguous manner. Auto Innovators and our members would like to work with CARB Staff in good faith to develop clear and concise regulations that automakers can confidently follow and that improve air quality.

Regardless of whether CARB reinstates LEV III via emergency rulemaking or non-emergency rulemaking, per the California Environmental Quality Act (CEQA), it must analyze the emissions impacts of adopting LEV III, instead of accepting manufacturer's certification to the U.S. EPA Tier 4 emission standards, since light-duty vehicles (LDVs) certified to Tier 4 standards will emit less than those vehicles certified to LEV III (or LEV IV for that matter).

Rather than adopting emergency regulations, Auto Innovators recommends CARB clearly state its intent, request and receive stakeholder feedback, and conduct a fully informed rulemaking to readopt the LEV III regulations. In the meantime, automakers would certify their vehicles to U.S. EPA Tier 3 (for 2026 MY) or U.S. EPA Tier 4 (2027 and subsequent MYs); as an alternative, and pursuant to MAC ECCD-2025-08, automakers may also optionally choose to certify to either ACC II or ACC I. All of these are modern stringent emission control requirements that protect human health, and all these options are allowed in MAC ECCD-2025-08.

Finally, since the proposed EVE regulations make significant and substantive changes to California's motor vehicle emission program, California is required to seek a waiver of federal preemption from the U.S. Environmental Protection Agency under Section 209(b) of the Clean Air Act or a determination that the amendments are within the scope of an existing waiver.

Current Situation Does Not Meet the Definition of an Emergency

Government Code §11342.545 defines "emergency" as "a situation that calls for immediate action to avoid serious harm to the public peace, health, safety, or general welfare." The current situation does not meet this standard. Most 2026 MY vehicles have already received CARB executive orders, and as discussed above, CARB issued MAC ECCD-2025-08 to specify certification requirements for 2025 and subsequent MY vehicles. If CARB believed this was an emergency, it should have acted immediately on June 12, 2025, when President Trump signed the bipartisan resolution passed by both Chambers of Congress under the CRA disapproving the ACC II waiver, rather than waiting over 3 months to declare an emergency. Moreover, President Trump's signature of the CRA resolution was not a surprise; CARB issued a MAC almost 3 weeks before President Trump signed the CRA resolution, and just a month ago, CARB issued MAC ECCD-2025-08. While we still have several questions on the implementation of this MAC, we recognize and appreciate its attempt to clarify the certification process. With appropriate clarification, MAC ECCD-2025-08 could be used until CARB completes a regular, nonemergency rulemaking and provides sufficient time for stakeholders to inform the process.

Since CARB did not pursue an emergency rulemaking in a timely manner, automakers have received executive orders referencing, at least in part, regulations covered by the CRA disapproval. Now, three months later, CARB claims emergency rules are necessary to protect public health and stabilize the California vehicle market. Unfortunately, the proposed EVE regulations further complicate this situation.

CARB's notice on September 23, 2025, requesting that the "emergency" regulations (which have not even been approved) be made permanent demonstrates this is not an "emergency" situation.

Rather, by providing extremely limited public participation with the “emergency” rulemaking and then, if approved, seeking immediately to have these “emergency” regulations made permanent, the public participation process is subverted. The proposed EVE regulations in this rulemaking do not clarify this situation; they complicate it. Finally, CARB’s claim of “serious harm” is undermined by existing federal EPA regulations that require vehicles to meet stringent nationwide emissions standards, as recognized in its MAC ECCD-2025-08.

Available Alternatives to Emergency Regulations Could Improve Air Quality

CARB justifies an emergency by stating in the Public Hearing Notice,⁹ “[e]very day that passes without clarity in this matter risks the health of millions of Californians...and the stability of the California vehicle market.” Then, in the same paragraph, CARB references the 29 million vehicles already on California roads and the emissions from those vehicles. Those 29 million vehicles are certified to California’s standards, so these proposed EVE regulations will not impact those vehicles or their emissions.

CARB seems to imply that without the EVE regulations, new vehicles will not meet any emissions standards. This is not true. New vehicles must still meet U.S. EPA’s emission standards. In the “Comparable Federal Regulations” section of the Notice of Public Hearing, CARB acknowledges that

U.S. EPA’s Tier 3 criteria pollutant standards are similar to the LEV III requirements for non-methane organic gas (NMOG) plus NOx, but not as stringent for particulate matter.

In fact, the Tier 3 LDV criteria pollutant standards are identical to LEV III apart from one element of the particulate matter (PM) standards. Starting in 2027 MY, automakers must meet U.S. EPA Tier 4 standards. According to CARB’s Notice of Public Hearing,

*U.S. EPA adopted their Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles Rule, that sets new Tier 4 standards to further reduce harmful air pollutant emissions from light-duty and medium-duty vehicles starting with model year 2027. Portions of this rule are identical to elements of the LEV IV requirements for those model years but are **more stringent once they are fully phased in by the 2033 model year than the LEV III requirements would be.** (emphasis added)*

Thus, CARB acknowledges that at least portions of the U.S. EPA Tier 4 standards are more stringent than the LEV III standards adopted in the proposed EVE regulations. In addition, most 2026 MY

⁹ California Air Resources Board. (2025, September 15). *5-Day public notice and comment period emergency amendment and adoption of vehicle emissions regulations.*
<https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2025/emergencyvehemissions/notice.pdf>

vehicles have already received executive orders from CARB. As a result, the starting point of the proposed EVE Regulations is more aptly 2027 MY, when the more stringent EPA Tier 4 regulations begin.

Contrary to the CEQA requirements¹⁰, CARB has not completed any analysis to demonstrate how or when the proposed EVE regulations will improve air quality—or, conversely, how or when those regulations will harm California’s air quality compared to the more stringent U.S. EPA Tier 4 emission standards. CARB should perform this analysis regardless of whether the regulations are adopted via emergency or non-emergency rulemaking.

Proposed Regulations Create Confusion and Uncertainty

Government Code section 11349.1(a) provides that OAL will review and determine whether all proposed regulations satisfy the required standards of necessity, authority, clarity, consistency, reference, and nonduplication. Leaving OAL to decide the other standards, Auto Innovators focuses on the lack of clarity of the proposed emergency regulations. Clarity means “written or displayed so that the meaning of regulations will be easily understood by those persons directly affected by them.” Government Code section 11349(c). The EVE emergency regulations fail to provide clarity.

First, for automakers, the proposed EVE regulations offer a Hobson’s choice. The proposed regulations suggest that automakers have the option to certify to a regulation but must do so at their own peril because: (a) CARB may invalidate that certification pathway; and (b) CARB may do this retroactively. This indefiniteness creates confusion, doubt, and uncertainty – the very elements the proposed regulations claim to resolve.

Moreover, the masked threat of retroactivity is plainly exposed in Executive Order R-25-002, where the Executive Officer “has determined that: . . . 4. Regulated parties may choose to follow either the Advanced Clean Cars II or Omnibus standards or the older pre-ACC II and pre-Omnibus provisions. However, if a court . . . issues a final ruling that [the resolutions] are invalid or that the waivers . . . are in effect, **the regulated parties are subject to the requirements of the regulations targeted by these congressional resolutions.**” (emphasis added).

¹⁰ CARB asserts in its Notice and Executive Order R-25-002 that the proposed EVE regulations are exempt per CEQA Guidelines, sections 15061(b)(3), 15037, and 1538, as explained in Appendix B. In Appendix B, CARB alleges its emergency proposal is exempt per section 15061(b)(3)’s “common sense” exemption because there is no possibility there will be any significant adverse impact on the environment, and exempt under sections 15307 and 15308 as there will not be any significant adverse impacts on the physical environment or alter the use of existing structures or facilities. CARB provides conclusory statements that the exemptions apply but no supporting evidence. CARB has not satisfied the requirements of CEQA, including that any exemptions apply.

However, administrative law includes a strong presumption *against* retroactivity.¹¹ Moreover, any attempt to enforce the Advanced Clean Cars II during the gap period (i.e., when the CRA resolutions were in effect and the waivers were not) would “attach new legal consequences” to manufacturers’ reasonable reliance on laws in place, including making decisions on which vehicles to manufacture and sell.¹² Retroactive penalties from this reasonable reliance would be inherently unreasonable and unlawful.¹³ CARB’s threat of retroactive enforcement essentially is an unauthorized attempt to enforce invalidated regulations.

Finally, the proposed EVE regulations appear to contain a number of drafting errors and other sources of confusion. While there may be some vague understanding of CARB’s intent (i.e., to readopt LEV III), automakers will be bound by the actual regulatory text in the proposed EVE regulations, whether or not that text actually effectuates the CARB’s presumed intent.

For illustrative purposes, we have identified the following incidents of regulatory text that are confusing or unworkable. Note that this in no way is an exhaustive list of the problems manufacturers would face trying to implement the proposed EVE regulations, but only a few examples we have identified in the short period of time allowed under this emergency rulemaking process.

CARB Might Retroactively Enforce ACC II ZEV Regulations, or ACC I ZEV Regulations, or No ZEV Regulation

The updated 13 CCR 1962.2 adds two new paragraphs to the existing regulation. Figure 1 below contains those paragraphs.

The 2025 MY light-duty vehicles (LDVs) have already received EOs from CARB, and 13 CCR 1962.2 does not apply to 2026 MY LDVs. Why would a manufacturer use a non-applicable regulation to determine which regulations are applicable? Yet, that’s exactly what the EVE regulations do. They use non-applicable regulations (13 CCR 1962.2) as an entry point to direct manufacturers to applicable regulation options. Using this logic, CARB could put 2027 MY certification options in 13 CCR 1962 (which expired after 2008 MY) or 1962.1 (which expired after 2017).

¹¹ See *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 208 (1988); *PHH Corp. V. CFPB*, 839 F.3d 1, 46 (D.C. Cir. 2016)(Kavanaugh, J.), reinstated in relevant part, 881 F.3d 75, 83 (D.C. Cir. 2018 (en banc)) (“Retroactivity . . . contravenes the bedrock due process principle that the people should have fair notice of what conduct is prohibited.”).

¹² *Nat’l Min. Ass’n v. Dep’t of Labor*, 292 F.3d 849, 859 (D.C. Cir. 2002) (per curiam)

¹³ Indeed, CARB has argued in comments related to an earlier EPA action that “[t]he presumption against statutory retroactivity has consistently been explained by reference to the unfairness of imposing new burdens on persons after the fact.” See October 26, 2018, Final CARB Detailed Comments on the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks, at 346 n. 747 (quoting *Landgraf v. USI Film Prods.*, 511 U.S. 244, 270 (1994)).

Figure 1: Revised 13 CCR 1962.2

§ 1962.2. Zero-Emission Vehicle Standards for 2018 through 2025 Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1962.2 or section 1962.2.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1962.2 to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

The first paragraph allows the automaker the option of certifying to this section 1962.2 unless and until a court invalidates the CRA resolutions. However, this section currently has no requirements for 2026 and subsequent MY zero emission vehicles (ZEVs). Does this mean there are no certification requirements for 2026 and subsequent MY ZEVs?

The manufacturer may also certify ZEVs to 1962.2.1, which is the ACC I ZEV regulation with all the ZEV sales requirements removed. However, this section 1962.2.1 references test procedures that contain the removed ZEV sales requirements and contain typos referring to itself as 1962.2 (rather than 1962.2.1) as shown in Figure 2 - 13 CCR 1962.2.1. It is unclear what test procedures or what part of those test procedures manufacturers should follow since the regulation in 1962.2.1 eliminates the ZEV sales mandate, but the test procedures referenced in the regulation contain the ZEV sales requirement. Also, the test procedures reference 1962.2 and make no mention of 1962.2.1.

Figure 2 - 13 CCR 1962.2.1

§ 1962.2.1 Zero-Emission Vehicle Standards for 2018 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles Electric Vehicle Charging Requirements. (Alternative)

- (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) [Reserved.]
- (c) [Reserved.]
- (d) [Reserved.]
- (e) [Reserved.]
- (f) [Reserved.]
- (g) [Reserved.]
- (h) Test Procedures.
 - (1) *Determining Compliance.* The certification requirements and test procedures for determining compliance with this section 1962.2 are set forth in "California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Year Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," amended September 3, 2015, which is incorporated herein by reference.

If a court invalidates the CRA resolution, manufacturers must certify to this section 1962.2. Does this mean if a court invalidates the CRA resolution, there are no certification requirements for 2026 and subsequent MY ZEVs? How does compliance with 1962.2 today, differ from compliance with 1962.2 under these emergency regulations before a court decision, and differ from compliance with 1962.2 after the court decision?

13 CCR 1962.4 contains the ACC II ZEV regulations with the ultimate ban on gasoline vehicles, but section 1962.4 is not addressed or even mentioned in the proposed EVE regulations. Is section 1962.4 still active? What triggers its implementation (if anything)? Could it apply retroactively?

Finally, if a court invalidates the CRA resolution, two sets of ZEV regulations would apply. The EVE regulations would subject manufacturers to both 1962.2.1 (effective for 2018 and subsequent model years) and 1962.4 (effective for model year 2026 and subsequent model years). Would manufacturers be subject to dual regulations within California with two different sets of certification requirements, two different sets of test procedures, one program that has a sales mandate, and another that does not? Would manufacturers be required to apply for two Executive Orders or display two vehicle emission labels?

CARB Might Retroactively Enforce Certification to ACC II Criteria Emission Regulations, ACC I Criteria Emission Regulations, or No Criteria Emission Regulations

The updated 13 CCR 1961.2 adds two new paragraphs to the existing regulation. Figure 3 below contains those paragraphs. Again, 13 CCR 1961.2 no longer applies. Why would a manufacturer use this non-applicable regulation to determine which regulations are applicable?

Figure 3 – Revised 13 CCR 1921.2

§ 1961.2. Exhaust Emission Standards and Test Procedures--2015 through 2025 Model Year Passenger Cars and Light-Duty Trucks, and 2015 through 2028 Model Year Medium-Duty Vehicles.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1961.2 or section 1961.2.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1961.2 to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

Just like with the ZEV regulations in 1962.2, the first paragraph allows the automaker the option of certifying to this section 1961.2 unless and until a court invalidates the CRA resolutions. However, this section has no requirements for 2026 and subsequent MY light duty vehicles. Currently, section 1961.2 of Title 13 in the California Code of Regulations “contains the California ‘LEV III’ exhaust emission standards for 2015 through 2025 model year passenger cars and light-duty trucks . . .” There are no standards past 2025 MY. Does this mean there are no certification requirements for 2026 and subsequent MY vehicles?

The manufacturer may also certify to 1961.2.1, which now “contains the California ‘LEV III’ exhaust emission standards for 2015 **and subsequent** model year passenger cars, light-duty trucks, and medium-duty vehicles.”

The new language also states that if a court invalidates the CRA resolutions, manufacturers must certify to this section 1961.2 (which, as discussed above, contains no requirements past 2025 MY). Does this mean if a court invalidates the CRA resolution, there are no certification requirements for 2026 and subsequent MY vehicles? How does compliance with 1961.2 today, differ from compliance with 1962.1 under these emergency regulations before a court decision, differ from compliance with 1961.2 after the court decision?

13 CCR 1961.4 contains the ACC II criteria emission regulations, but section 1961.4 is not addressed or even mentioned in the proposed EVE regulations. Is section 1961.4 still active? What triggers its implementation (if anything)?

Finally, it is not clear if manufacturers can certify some test groups to 1961.2 and others to 1961.2.1 and maybe still others to 1961.4; or if the manufacturer must certify all its vehicles to one of the three different regulations that CARB mentions in the emergency regulations (or doesn't mention as is the case with 13 CCR 1961.4).

Further complicating all of this is that 1961.2.1 and 1961.2 and 1961.4 all contain separate fleet average requirements and separate phase in requirements for different elements of the regulation. It is not the least bit clear what requirements apply to which vehicles.

All ZEV Charging Requirements in 1962.3 and 1962.3.1 are Out of Date

Another specific example of the type of ambiguity manufacturers would need to navigate if the EVE regulations are approved is related to how manufacturers comply with the charging requirements.

The ACC I ZEV charging requirements in 1962.3.1 point to SAE procedures from 2010, specific power output requirements, and specific charger outlet and/or adapter requirements. On the other hand, the ACC II ZEV charging requirements in 1962.3 point to SAE procedures from 2017, different specific output requirements, and different charger/adapter requirements. This emergency rulemaking would immediately insert greater uncertainty as to what requirements manufacturers certify their ZEVs to, whether previously-certified ZEVs could be de-certified, and whether ZEVs already in their production process could be forced to re-certify with different hardware and/or software requirements that cannot be changed without sufficient lead-time.

Adding to the confusion around certification to the charging requirements regulation is the fact that all of industry has now aligned around a single SAE charging standard (SAE J3400) for both AC and DC charging, that is not reflected anywhere in any of CARB's requirements. Most manufacturers will have fully converted their new EV fleets to this new standard for Model Year 2027. This standard includes improvements in communication, security, and performance, such as thermal sensing and arc detection, to improve charging reliability and safety.

Finally, we note that the ZEV Charging Section 1962.3 contains a typographical error in the second paragraph directing compliance to 13 CCR 1900 (the Definitions section of Title 13) for ZEV charging if a court invalidates the CRA.

OBD II Requirements in 1968.2.1 Are Incompatible with LEV III Exhaust Requirements in 1961.2.1

The proposed EVE regulation added OBD regulations as adopted in 2013 as a new section 13 CCR 1968.2.1. Presumably, CARB chose to adopt the OBD regulations operative 7-31-2013, because the OBD regulations that became operative on 7-25-2016, 10-3-2019, 4-1-2022, and 11-22-2022 never received a waiver.

Unfortunately, CARB adopted the 7-31-2013 OBD regulations before the LEV III requirements. Consequently, the OBD regulations in 1968.2.1 do not include any LEV III requirements contained in 1961.2.1 (or 1961.2 for that matter). For example, the OBD regulations in 1968.2.1 contain requirements for LEV I applications and for LEV II applications, but do not contain any LEV III requirements. Such incompatibility for LEV III vehicles would make it technically impossible to develop and certify an OBD system to meet both 13 CCR 1968.2.1 and 1961.2.1.

Nonetheless, as shown in Figure 4 below, the updated 13 CCR 1968.2 provides the option for manufacturers to certify to 1968.2.1. It's unclear how this option could be utilized given it does not and has not applied to any vehicles for over a decade (i.e., manufacturers have only applied for LEV III applications for the past decade). Because LEV III requirements started to be added in OBD regulations and became operative on 7-25-2016 and later, one approach is to allow OBD regulations adopted in 2016 and later, instead of asking manufacturers to choose between CCR 1968.2 and CCR 1968.2.1.

Figure 4 – Revised 13 CCR 1968.2

§ 1968.2 Malfunction and Diagnostic System Requirements--2004 and Subsequent Model Year Passenger Cars, Light Duty Trucks, and Medium Duty Vehicles and Engines.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1968.2 or section 1968.2.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1968.2 to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

The examples above clearly show the proposed EVE regulations do not meet the clarity standard – the meaning of the regulations is *not* easily understood by those persons directly affected by them.

A related concern is that the lack of clarity is a violation of due process under California's Constitution, Article I, Section 7 for the parties CARB intends to regulate. Due Process requires the government to give parties "an opportunity (1) to know what the law is and (2) to conform their conduct accordingly."¹⁴ Here, the regulated parties are entitled to know what the proposed EVE regulations require so they can ensure their conduct satisfies such requirements. However, the significant lack of clarity of these proposed EVE regulations runs afoul of due process.

CARB Must Seek a Waiver or a Within-The-Scope Determination from EPA to Implement the Proposed EVE Regulations

The proposed amendments would make significant and substantive changes to California's motor vehicle emission program. For instance, and as discussed above, the California Code of Regulations currently does not contain any light-duty criteria emission standards past 2025 MY; by its express terms, Section 1961.2 applies only to "2015 through 2025 model year passenger cars and light-duty trucks." This EVE regulation would add a new section 1961.2.1 to the Code of Regulation that would extend criteria emissions regulations past 2025 MY. The EVE regulation would also add new language to dozens of regulations concerning the purported impact of a court decision concerning the CRA resolution—language which EPA has never reviewed or approved.

California must therefore seek from the U.S. EPA either a new waiver of preemption under Section 209(b) of the Clean Air Act, or a determination that the amendments are within the scope of an existing waiver (a "within the scope determination").¹⁵ As EPA has long recognized:

[T]he possibility that CARB may revise its standards is always present. Such a revision would be considered by EPA in a future waiver proceeding. EPA would then determine whether those changes are within-the-scope of its prior waiver or if a new, full waiver

¹⁴ *Landgraf*, 511 U.S. at 265; see *Sessions v. Dimaya*, 138 S. Ct. 1204, 1225 (2018) (Gorsuch, J., concurring) ("Perhaps the most basic of due process's customary protections is the demand of fair notice.").

¹⁵ It is questionable whether these amendments could fall within the scope of the waiver EPA granted to California in 2013 for the ACC I regulations, since that application and waiver were for just MY 2015 through 2025 vehicles. See California State Motor Vehicle Pollution Control Standards; Notice of Decision Granting a Waiver of Clean Air Act Preemption for California's Advanced Clean Car Program and a Within the Scope Confirmation for California's Zero Emission Vehicle Amendments for 2017 and Earlier Model Years, 78 Fed. Reg. 2112 (Jan. 9, 2013) ("Today, as Assistant Administrator of the EPA's Office of Air and Radiation, I am granting California's request for a waiver of Clean Air Act preemption for California's ACC that combines the control of smog and soot causing pollutants and GHG emissions into a single coordinated package of requirements for MY 2015 through 2025 passenger cars (PCs), light-duty trucks (LDTs), medium-duty passenger vehicles (MDPVs), and limited requirements related to heavy-duty vehicles (HDVs).") (emphasis added).

determination would need to be made, as would be required if California decided to increase the stringency of [the relevant] standards.¹⁶

EPA has articulated the following analytic framework for instances where California amends its regulations in a way that the state believes falls within the scope of an existing waiver:

If California amends regulations that were previously granted a waiver, EPA can confirm that the amended regulations are within the scope of the previously granted waiver. Such within-the-scope amendments are permissible without a full waiver review if EPA determines three conditions are met. First, the amended regulations must not undermine California's determination that its standards, in the aggregate, are as protective of public health and welfare as applicable federal standards. Second, the amended regulations must not affect consistency with section 202(a) of the Act. Third, the amended regulations must not raise any “new issues” affecting EPA's prior waivers.¹⁷

Notably, the decision as to whether a regulatory amendment falls within the scope of an existing waiver lies with EPA and not with CARB. In light of this framework, California has consistently—and with only one exception we know of¹⁸—requested either a new waiver or a within-the-scope determination from EPA when it amends its emissions regulations in any way. Here are but a few examples:

- California State Motor Vehicle Pollution Control Standards; Heavy-Duty Vehicle and Engine Emission Warranty and Maintenance Provisions; Request for Waiver of Preemption; Opportunity for Public Hearing and Public Comment, 87 Fed. Reg. 35,760, (June 13, 2022) (“By letter dated October 22, 2021, CARB submitted a request that EPA determine that the 2018 HD Warranty Amendments are within the scope of the previously-granted waiver for

¹⁶ California State Motor Vehicle Pollution Control Standards; Notice of Decision Granting a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles, 74 Fed. Reg. 32,744, 32,753 (July 8, 2009).

¹⁷ California State Motor Vehicle Pollution Control Standards; Heavy-Duty Vehicle and Engine Emission Warranty and Maintenance Provisions; Request for Waiver of Preemption; Opportunity for Public Hearing and Public Comment, 87 Fed. Reg. 35,760, 35,762 (June 13, 2022).

¹⁸ That one exception was when California amended its regulations in September 2018 to remove the “deemed to comply” provision from its previously waived greenhouse gas emission standards. California’s failure to seek a new waiver or a within-the-scope determination was clearly erroneous in light of the fact that California sought and obtained a within-the-scope determination when it *added* the deemed to comply provision to its regulations. See California State Motor Vehicle Pollution Control Standards; Within-the-Scope Determination for Amendments to California’s Motor Vehicle Greenhouse Gas Regulations; Notice of Decision, 76 Fed. Reg. 34,693 (June 14, 2011) (noting that “CARB submitted a request to EPA seeking confirmation that these two sets of amendments [pooling and deemed-to-comply provisions] are within the scope of the waiver of preemption issued by EPA under section 209(b) of the Clean Air Act”).

California's emission standards and associated test procedures for 2007 and subsequent model year heavy-duty diesel vehicles and engines.”)

- California State Nonroad Engine Pollution Control Standards; In-Use Diesel-Fueled Transport Refrigeration Units (TRUs) and TRU Generator Sets and Facilities Where TRUs Operate; Notice of Decision, 82 Fed. Reg. 6,525, 6,526 (January 19, 2017) (“CARB requested an EPA determination that certain provisions of the 2011 amendments are within the scope of the prior authorizations, or in the alternative, merit full authorization (‘Within-the-Scope Amendments’).”)
- California State Motor Vehicle Pollution Control Standards; Amendments to On-Highway Heavy-Duty Vehicle In-Use Compliance Program, Amendments to 2007 and Subsequent Model Year On-Highway Heavy-Duty Engines and Vehicles, and Amendments to Truck Requirements; Notice of Decision, 82 Fed. Reg. 4,867, 4,868 (January 17, 2017) (“CARB's request also sought confirmation that its 2007 Amendments and the Truck Idling Amendments are within the scope of waivers of preemption previously granted by EPA.”)
- California State Motor Vehicle Pollution Control Standards; Malfunction and Diagnostic System Requirements for 2010 and Subsequent Model Year Heavy-Duty Engines; Notice of Decision, 81 Fed. Reg. 78,149, 78,150 (November 7, 2016) (“By letter dated February 12, 2014, CARB submitted to EPA a request for a determination that the 2013 HD OBD Amendments are within the scope of the previous HD OBD waiver or, alternatively, that EPA grant California a waiver of preemption for the 2013 HD OBD Amendments.”)
- California State Nonroad Engine Pollution Control Standards; Large Spark-Ignition (LSI) Engines; New Emission Standards and In-Use Fleet Requirements; Notice of Decision, 80 Fed. Reg. 76,468 (December 9, 2015) (“CARB also submitted its 2010 LSI Fleet Amendments for confirmation from EPA that such amendments are within the scope of a previous EPA authorization.”)
- California State Motor Vehicle Pollution Control Standards; Notice of Decision Granting a Waiver of Clean Air Act Preemption for California's Advanced Clean Car Program and a Within the Scope Confirmation for California's Zero Emission Vehicle Amendments for 2017 and Earlier Model Years, 78 Fed. Reg. 2,112 (January 9, 2013) (“CARB also sought confirmation that the amendments to the ZEV program are within the scope of prior waiver decisions issued by EPA, or in the alternative requested a waiver for these revisions.”)
- California State Motor Vehicle Pollution Control Standards; Within the Scope Requests; Opportunity for Public Hearing and Comment, 69 Fed. Reg. 5,542 (February 5, 2004) (“CARB

submitted an October 30, 2003, letter to the Administrator notifying EPA that it had adopted additional amendments to its OBD II program and requesting that EPA confirm that its amendments are within the scope of the previously granted OBD II waiver.”)

- California State Motor Vehicle Pollution Control Standards; Amendments Within the Scope of Previous Waiver of Federal Preemption, 46 Fed. Reg. 36,742 (July 15, 1981) (“In its letter, CARB stated its belief that the changes caused by the amendment were included within the scope of a waiver of Federal preemption that EPA already granted to California.”)

There are many more such instances. This long course of conduct by both CARB and the U.S. EPA fully supports the conclusion that if CARB were to finalize and seek to enforce these EVE regulations amending the provisions in the California Code of Regulations, it must first seek and obtain either a new waiver or a within-the-scope determination from EPA.

Conclusion

First, the current situation does not constitute an emergency under California statute. For this reason alone, OAL should reject CARB’s proposed EVE regulations. For over three months, CARB has issued MACs and manufacturers have certified vehicles. This will continue to be the case as 2027 MY certification begins late this year and throughout next year. CARB must allow manufacturers to certify to the U.S. EPA Tier 4 (for 2027 MY), which are as or more stringent than the LEV III options this emergency regulation would require. Furthermore, CARB should provide clear and immediate procedural direction to certification staff as to how the certification to Federal standards in MAC ECCD-2025-08 will be executed by CARB.

Second, the EVE regulations would introduce an unprecedented degree of uncertainty and chaos into vehicle certification and the California new vehicle market. This is not uncertainty created by the federal government, but rather uncertainty created by CARB’s EVE regulations whether adopted via emergency or non-emergency rulemaking. The EVE regulations cannot be followed with any degree of clarity or certainty. They rely on manufacturers guessing at what CARB means by the regulatory text, following regulations that no longer apply, and then threaten to retroactively enforce regulations that CARB currently has no authority to enforce.

We urge OAL to reject these emergency regulations. To prevent further uncertainty in the California new vehicle market, CARB should work in good faith with stakeholders to develop clear regulatory paths as they have successfully done for more than 30 years.

Sincerely,



Charles Haake
Chief Legal Officer and General Counsel
Alliance for Automotive Innovation

Appendix A-3

Proposed Amendments to Title 13 Regulation Order

Emergency Vehicle Emissions Regulation

[Note: This version of the Proposed Amendments to Title 13 Regulation Order also complies with Government Code section 11346.2 subdivision (a)(3). The existing regulatory language is shown in "normal type." The proposed amendments subject to comment in this rulemaking are shown in underline to indicate additions and strikeout to indicate deletions from the existing regulatory text. [Bracketed bold text] is placeholder text for these amendment's approval date. Vertical lines in the left margins are to flag where changes are proposed for ease of reference and are not part of the proposed amendments. The proposed amendments are being presented in two versions. For ease of readability, and to review the proposed amendments in an Accessible format that can toggle between amendments in strikeout/underline and a "clean" version with amendments incorporated into the regulatory text, please refer to the Word version of this Proposed Regulation Order.

Subsections for which no changes are made in this rulemaking are indicated with

"* * * * *"

The Chapters and Sections of title 13, California Code of Regulations that are being proposed for amendments per this regulatory proposal are as follows.

Chapter 1. Motor Vehicle Pollution Control Devices

Section 1900.	Definitions.
Section 1956.8.	Exhaust Emissions Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Engines and Vehicles, 2021 and Subsequent Zero-Emission Powertrains, and 2022 and Subsequent Model Heavy-Duty Hybrid Powertrains.
Section 1961.2.	Exhaust Emission Standards and Test Procedures--2015 through 2025 Model Year Passenger Cars and Light-Duty Trucks, and 2015 through 2028 Model Year Medium-Duty Vehicles.
Section 1961.3.	Greenhouse Gas Exhaust Emission Standards and Test Procedures--2017 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.
Section 1962.2.	Zero-Emission Vehicle Standards for 2018 through 2025 Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.
Section 1962.3.	Electric Vehicle Charging Requirements.
Section 1965.	Emission Control, Smog Index, and Environmental Performance Labels - 1979 and Subsequent Model-Year Motor Vehicles.
Section 1968.2.	Malfunction and Diagnostic System Requirements--2004 and Subsequent Model Year Passenger Cars, Light Duty Trucks, and Medium Duty Vehicles and Engines.
Section 1968.5.	Enforcement of Malfunction and Diagnostic System Requirements for 2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines.
Section 1969.	Motor Vehicle Service Information--1994 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Engines and Vehicles, and 2007 and Subsequent Model Heavy-Duty Engines.

Section 1971.1.	On-Board Diagnostic System Requirements--2010 and Subsequent Model-Year Heavy-Duty Engines.
Section 1971.5.	Enforcement of Malfunction and Diagnostic System Requirements for 2010 and Subsequent Model-Year Heavy Duty Engines.
Section 1976.	Standards and Test Procedures for Motor Vehicle Fuel Evaporative Emissions.
Section 1978.	Standards and Test Procedures for Vehicle Refueling Emissions.
Section 2035.	Purpose, Applicability, and Definitions.
Section 2036.	Defects Warranty Requirements for 1979 Through 1989 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles; 1979 and Subsequent Model Motorcycles and Heavy-Duty Vehicles; and Motor Vehicle Engines Used in Such Vehicles; and 2020 and Subsequent Model Year Trailers.
Section 2037.	Defects Warranty Requirements for 1990 and Subsequent Model Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, and Motor Vehicle Engines Used in Such Vehicles.
Section 2038.	Performance Warranty Requirements for 1990 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and Motor Vehicle Engines Used in Such Vehicles.
Section 2040.	Vehicle Owner Obligations.

Chapter 2. Enforcement of Vehicle Emission Standards and Surveillance Testing

Section 2111.	Applicability.
Section 2112.	Definitions.
Section 2113.	Initiation and Approval of Voluntary and Influenced Emission-Related Recalls.
Section 2114.	Voluntary and Influenced Recall Plans.
Section 2115.	Eligibility for Repair.

Section 2116.	Repair Label.
Section 2117.	Proof of Correction Certificate.
Section 2118.	Notification.
Section 2119.	Recordkeeping and Reporting Requirements.
Section 2121.	Penalties.
Section 2123.	Initiation and Notification of Ordered Emission-Related Recalls.
Section 2125.	Ordered Recall Plan.
Section 2126.	Approval and Implementation of Recall Plan.
Section 2127.	Notification of Owners.
Section 2128.	Repair Label.
Section 2129.	Proof of Correction Certificate.
Section 2130.	Capture Rates and Alternative Measures.
Section 2131.	Preliminary Tests.
Section 2133.	Recordkeeping and Reporting Requirements.
Section 2137.	Vehicle, Engine, and Trailer Selection.
Section 2139.	Testing.
Section 2139.5.	CARB Authority to Test for Heavy-Duty In-Use Compliance.
Section 2140.	Notification and Use of Test Results.
Section 2141.	General Provisions.
Section 2142.	Alternative Procedures.
Section 2143.	Failure Levels Triggering Recall and Corrective Action.
Section 2144.	Emission Warranty Information Report.
Section 2145.	Field Information Report.
Section 2146.	Emissions Information Report.

Section 2147.	Demonstration of Compliance with Emission Standards.
Section 2148.	Evaluation of Need for Recall.
Section 2149.	Notification and Subsequent Action.
Section 2166.	General Provisions.
Section 2166.1.	Definitions.
Section 2167.	Required Recall and Corrective Action for Failures of Exhaust After-Treatment Devices, on-Board Computers or Systems, Urea Dosers, Hydrocarbon Injectors, Exhaust Gas Recirculation Valves, Exhaust Gas Recirculation Coolers, Turbochargers, Fuel Injectors.
Section 2168.	Required Corrective Action and Recall for Emission-Related Component Failures.
Section 2169.	Required Recall or Corrective Action Plan.
Section 2169.1.	Approval and Implementation of Corrective Action Plan.
Section 2169.2.	Notification of Owners.
Section 2169.3.	Repair Label.
Section 2169.4.	Proof of Correction Certificate.
Section 2169.5.	Preliminary Tests.
Section 2169.6.	Communication with Repair Personnel.
Section 2169.7.	Recordkeeping and Reporting Requirements.
Section 2169.8.	Extension of Time.
Section 2170.	Penalties.

Chapter 8. Clean Fuels Program.

Section 2317.	Satisfaction of Designated Clean Fuel Requirements with a Substitute Fuel.

Chapter 9. Off-Road Vehicles and Engines Pollution Control Devices

Section 2423. Exhaust Emission Standards and Test Procedures — Off-Road Compression-Ignition Engines.

Chapter 10. Mobile Source Operational Controls

Section 2485 Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.

Chapter 16. Certification Fees for Mobile Sources

Section 2903. Definitions.

Proposed Regulation Order

Amendments to Title 13, California Code of Regulations

Amend Sections 1900, 1956.8, 1961.2, 1961.3, 1962.2, 1962.3, 1965, 1968.2, 1968.5, 1969, 1971.1, 1971.5, 1976, 1978, 2035, 2036, 2037, 2038, 2040, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2121, 2123, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2133, 2137, 2139, 2139.5, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2166, 2166.1, 2167, 2168, 2169, 2169.1, 2169.2, 2169.3, 2169.4, 2169.5, 2169.6, 2169.7, 2169.8, 2170, 2317, 2423, 2485, and 2903.

§ 1900. Definitions.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1900 or section 1900.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1900 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 39010, 39600, 39601, 43013, 43018, 43101 and 43104, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39500, 40000, 43000, 43013, 43018.5, 43100, 43101, 43101.5, 43102, 43103, 43104, 43106 and 43204, Health and Safety Code; and Section 27156, Vehicle Code.

§ 1956.8. Exhaust Emissions Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Engines and Vehicles, 2021 and Subsequent Zero-Emission Powertrains, and 2022 and Subsequent Model Heavy-Duty Hybrid Powertrains.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1956.8 or section 1956.8.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1956.8 **beginning with the fourth full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 38580, 39500, 39600, 39601, 40000, 43013, 43018, 43100, 43101, 43102, 43104, 43105, 43106 and 43806, Health and Safety Code; and Section 28114, Vehicle Code. Reference: Sections 38501, 38505, 38510, 38560, 38580, 39002, 39003, 39010, 39017, 39033, 39500, 39600, 39601, 39610, 39650, 39657, 39667, 39701, 40000, 43000, 43000.5, 43009, 43009.5, 43013, 43017, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43202, 43204, 43205, 43205.5, 43206, 43210, 43211, 43212, 43213 and 43806, Health and Safety Code; and Section 28114, Vehicle Code.

§ 1961.2. Exhaust Emission Standards and Test Procedures--2015 through 2025 Model Year Passenger Cars and Light-Duty Trucks, and 2015 through 2028 Model Year Medium-Duty Vehicles.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either ~~this~~ section 1961.24 or section 1961.2.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1961.42—beginning with the second full model year after such decision to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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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, 43205 and 43205.5, Health and Safety Code.

**§ 1961.3. Greenhouse Gas Exhaust Emission Standards and Test Procedures--
2017 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-
Duty Passenger Vehicles.**

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1961.3 or section 1961.3.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1961.3 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38550, 38566, 39500, 39600, 39601, 43013, 43018, 43018.5, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43018.5, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106 and 43211, Health and Safety Code.

§ 1962.2. Zero-Emission Vehicle Standards for 2018 through 2025 Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either ~~this~~ section 1962.24 or section 1962.2.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1962.24 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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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, 43205 and 43205.5, Health and Safety Code.

§ 1962.3. Electric Vehicle Charging Requirements.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1962.3 or section 1962.3.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section **1900-1962.3 beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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(c) Requirements.

(1) *Alternating Current (AC) Charger Inlet*. Beginning with the 2006 model year, all vehicles identified in subsection (a) must be equipped with a conductive charger inlet and charging system which meets all the specifications applicable to AC Level 1 and Level 2 charging contained in SAE Surface Vehicle Recommended Practice SAE J1772 REV **OCT-2017/JAN 2024**, SAE Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charger Coupler **or SAE J3400 SEP 2024, North American Charging System (NACS) for Electric Vehicles**, which is incorporated herein by reference. All such vehicles, manufactured through 2025 model year, must also be equipped with an on-board charger with a minimum output of 3.3 kilowatts or capable of providing sufficient power to enable a complete charge in less than 4 hours. All such vehicles manufactured for 2026 and subsequent model years must also be equipped with an on-board charger with a minimum output of 5.76 kilowatts (calculated as 24 amps at 240 volts AC) or capable of providing sufficient power to enable charging from a state of discharge to a full charge in less than 4 hours.

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(4) *Direct Current (DC) Charger Inlet*. For 2026 and subsequent model years, all battery electric vehicles must be equipped with a DC inlet that meets the specifications applicable to DC charging contained in SAE J1772 REV **OCT-2017/JAN 2024**, SAE Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charger Coupler, **or SAE J3400 SEP 2024, North American Charging System (NACS) for Electric Vehicles**, which is incorporated herein by reference. 2026 and subsequent model year plug-in hybrid electric vehicles equipped with a DC inlet must meet the specifications applicable to DC charging contained in SAE J1772 REV OCT 2017, SAE Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charger Coupler.

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, 43205 and 43205.5, Health and Safety Code.

§ 1965. Emission Control, Smog Index, and Environmental Performance Labels - 1979 and Subsequent Model-Year Motor Vehicles.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1965 or section 1965.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1965 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018, 43101, 43104, 43105, 43200 and 43200.1, Health and Safety Code. Reference: Sections 39002, 39003, 43000, 43013, 43018.5, 43100, 43101, 43102, 43104, 43107, 43200 and 43200.1, Health and Safety Code.

§ 1968.2 Malfunction and Diagnostic System Requirements--2004 and Subsequent Model Year Passenger Cars, Light Duty Trucks, and Medium Duty Vehicles and Engines.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1968.2 or section 1968.2.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1968.2 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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NOTE: Authority cited: Sections 38501, 38510, 39010, 39600, 39601, 39602.5, 43000.5, 43013, 43018, 43100, 43101, 43104, 43105, 43105.5 and 43106, Health and Safety Code; and Engine Manufacturers Association v. California Air Resources Board (2014) 231 Cal.App.4th 1022. Reference: Sections 38501, 38505, 38510, 39002, 39003, 39010, 39018, 39021.5, 39024, 39024.5, 39027, 39027.3, 39028, 39029, 39031, 39032, 39032.5, 39033, 39035, 39037.05, 39037.5, 39038, 39039, 39040, 39042, 39042.5, 39046, 39047, 39053, 39054, 39058, 39059, 39060, 39515, 39600, 39601, 39602.5, 43000, 43000.5, 43004, 43006, 43013, 43016, 43018, 43100, 43101, 43102, 43104, 43105, 43105.5, 43106, 43150, 43151, 43152, 43153, 43154, 43155, 43156, 43204, 43211 and 43212, Health and Safety Code.

§ 1968.5. Enforcement of Malfunction and Diagnostic System Requirements for 2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1968.5 or section 1968.5.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1968.5 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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NOTE: Authority cited: Sections 38501, 38510, 39010, 39600, 39601, 39602.5, 43000.5, 43013, 43016, 43018, 43100, 43101, 43104, 43105, 43105.5, 43106, 43154, 43211, and 43212, Health and Safety Code; and Engine Manufacturers Association v. California Air Resources Board (2014) 231 Cal.App.4th 1022. Reference: Sections 38501, 38505, 38510, 39002, 39003, 39010, 39018, 39021.5, 39024, 39024.5, 39027, 39027.3, 39028, 39029, 39031, 39032, 39032.5, 39033, 39035, 39037.05, 39037.5, 39038, 39039, 39040, 39042, 39042.5, 39046, 39047, 39053, 39054, 39058, 39059, 39060, 39515, 39600, 39601, 39602.5, 43000, 43000.5, 43004, 43006, 43013, 43016, 43018, 43100, 43101, 43102, 43104, 43105, 43105.5, 43106, 43150, 43151, 43152, 43153, 43154, 43155, 43156, 43204, 43211 and 43212, Health and Safety Code.

§ 1969. Motor Vehicle Service Information--1994 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Engines and Vehicles, and 2007 and Subsequent Model Heavy-Duty Engines.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1969 or section 1969.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1969 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 39600, 39601, 43000.5, 43018, 43105.5 and 43700, Health and Safety Code. Reference: Sections 39027.3, 43104 and 43105.5, Health and Safety Code; and Sections 1633.7 and 1633.8, Civil Code.

§ 1971.1. On-Board Diagnostic System Requirements--2010 and Subsequent Model-Year Heavy-Duty Engines.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1971.1 or section 1971.1.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1971.1 **beginning with the fourth full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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NOTE: Authority cited: Sections 38501, 38510, 39010, 39600, 39601, 39602.5, 43000.5, 43013, 43018, 43100, 43101, 43104, 43105, 43105.5, and 43106, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 39002, 39003, 39010, 39018, 39021.5, 39024, 39024.5, 39027, 39027.3, 39028, 39029, 39031, 39032, 39032.5, 39033, 39035, 39037.05, 39037.5, 39038, 39039, 39040, 39042, 39042.5, 39046, 39047, 39053, 39054, 39058, 39059, 39060, 39515, 39600, 39601, 39602.5, 43000, 43000.5, 43004, 43006, 43013, 43016, 43018, 43100, 43101, 43102, 43104, 43105, 43105.5, 43106, 43150, 43151, 43152, 43153, 43154, 43155, 43156, 43204, 43211, and 43212, Health and Safety Code.

§ 1971.5. Enforcement of Malfunction and Diagnostic System Requirements for 2010 and Subsequent Model-Year Heavy Duty Engines.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1971.5 or section 1971.5.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1971.5 **beginning with the fourth full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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NOTE: Authority cited: Sections 39010, 39600, 39601, 43000.5, 43013, 43016, 43018, 43100, 43101, 43104, 43105, 43105.5, 43106, 43154, 43211, and 43212, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39018, 39021.5, 39024, 39024.5, 39027, 39027.3, 39028, 39029, 39031, 39032, 39032.5, 39033, 39035, 39037.05, 39037.5, 39038, 39039, 39040, 39042, 39042.5, 39046, 39047, 39053, 39054, 39058, 39059, 39060, 39515, 39600, 39601, 43000, 43000.5, 43004, 43006, 43013, 43016, 43018, 43100, 43101, 43102, 43104, 43105, 43105.5, 43106, 43150, 43151, 43152, 43153, 43154, 43155, 43156, 43204, 43211, and 43212, Health and Safety Code.

§ 1976. Standards and Test Procedures for Motor Vehicle Fuel Evaporative Emissions.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1976 or section 1976.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1976 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 39500, 39600, 39601, 39667, 43013, 43018, 43101, 43104, 43105, 43106 and 43107, Health and Safety Code. Reference: Sections 39002, 39003, 39500, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204 and 43205, Health and Safety Code.

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§ 1978. Standards and Test Procedures for Vehicle Refueling Emissions.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 1978 or section 1978.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 1978 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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

§ 2035. Purpose, Applicability, and Definitions.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2035 or section 2035.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2035 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43205 and 43205.5, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38560, 43106, 43204, 43205 and 43205.5, Health and Safety Code.

§ 2036. Defects Warranty Requirements for 1979 Through 1989 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles; 1979 and Subsequent Model Motorcycles and Heavy-Duty Vehicles; and Motor Vehicle Engines Used in Such Vehicles; and 2020 and Subsequent Model Year Trailers.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2036 or section 2036.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2036 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600 and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38560, 43106, 43204, 43205.5, 44004, 44010, 44011, 44012, 44015 and 44017, Health and Safety Code.

§ 2037. Defects Warranty Requirements for 1990 and Subsequent Model Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, and Motor Vehicle Engines Used in Such Vehicles.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2037 or section 2037.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2037 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600 and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38560, 43106, 43204, 43205, 44004, 44010, 44011, 44012, 44015 and 44017, Health and Safety Code.

§ 2038. Performance Warranty Requirements for 1990 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and Motor Vehicle Engines Used in Such Vehicles.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2038 or section 2038.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2038 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 39600 and 39601, Health and Safety Code. Reference: Sections 43106, 43204, 43205, 44004, 44010, 44011, 44012, 44014 and 44015, Health and Safety Code.

§ 2040. Vehicle Owner Obligations.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2040 or section 2040.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2040 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 39600 and 39601, Health and Safety Code. Reference: Sections 43106, 43204, 43205 and 43205.5, Health and Safety Code.

§ 2111. Applicability.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2111 or section 2111.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2111 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2112. Definitions.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2112 or section 2112.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2112 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39010, 39600, 39601, 43013, 43018, 43101, 43104, 43105 and 43806, Health and Safety Code; and Section 28114, Vehicle Code. Reference: Sections 38501, 38505, 38510, 38560, 39002, 39003, 39010, 39500, 39601, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43202, 43204-43205.5, 43206, 43210, 43211, 43212, 43213 and 43806, Health and Safety Code; and Section 28114, Vehicle Code.

§ 2113. Initiation and Approval of Voluntary and Influenced Emission-Related Recalls.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2113 or section 2113.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2113 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 28501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2114. Voluntary and Influenced Recall Plans.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2114 or section 2114.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2114 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2115. Eligibility for Repair.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2115 or section 2115.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2115 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2116. Repair Label.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2116 or section 2116.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2116 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2117. Proof of Correction Certificate.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2117 or section 2117.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2117 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 3850, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2118. Notification.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2118 or section 2118.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2118 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2119. Recordkeeping and Reporting Requirements.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2119 or section 2119.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2119 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2121. Penalties.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2121 or section 2121.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2121 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2123. Initiation and Notification of Ordered Emission-Related Recalls.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2123 or section 2123.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2123 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2125. Ordered Recall Plan.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2125 or section 2125.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2125 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections HSC 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2126. Approval and Implementation of Recall Plan.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2126 or section 2126.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2126 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2127. Notification of Owners.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2127 or section 2127.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2127 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2128. Repair Label.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2128 or section 2128.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2128 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2129. Proof of Correction Certificate.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2129 or section 2129.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2129 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2130. Capture Rates and Alternative Measures.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2130 or section 2130.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2130 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2131. Preliminary Tests.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2131 or section 2131.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2131 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2133. Recordkeeping and Reporting Requirements.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2133 or section 2133.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2133 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2137. Vehicle, Engine, and Trailer Selection.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2137 or section 2137.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2137 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Health and Safety Code Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2139. Testing.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2139 or section 2139.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2139 **beginning with the fourth full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38560, 39002, 39003, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43103, 43104, 43105, 43106, 43107, 43204-43205.5 and 43211-43213, Health and Safety Code.

§ 2139.5. CARB Authority to Test for Heavy-Duty In-Use Compliance.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2139.5.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2139.5 beginning with the second full model year after such decision to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38560, 39002, 39003, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43103, 43104, 43105, 43106, 43107, 43204-43205.5 and 43211-43213, Health and Safety Code.

§ 2140. Notification and Use of Test Results.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2140 or section 2140.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2140 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, 43204-43205.5 and 43211-43213, Health and Safety Code.

§ 2141. General Provisions.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2141 or section 2141.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2141 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39500, 39600, 39601, 43000.5, 43013, 43105, 43204, 43205.5 and 43214 Health and Safety Code.
Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2142. Alternative Procedures.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2142 or section 2142.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2142 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39500, 39600, 39601, 43000.5, 43013, 43018, 43105, 43204, 43205.5 and 43214 Health and Safety Code.
Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2143. Failure Levels Triggering Recall and Corrective Action.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2143 or section 2143.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2143 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39500, 39600, 39601, 43000.5, 43013, 43105, 43204, 43205.5 and 43214 Health and Safety Code.

Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2144. Emission Warranty Information Report.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2144 or section 2144.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2144 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39500, 39600, 39601, 43000.5, 43013, 43018, 43105, 43204, 43205.5 and 43214 Health and Safety Code.
Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2145. Field Information Report.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2145 or section 2145.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2145 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39500, 39600, 39601, 43000.5, 43013, 43018 43105, 43204, 43205.5 and 43214 Health and Safety Code.
Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2146. Emissions Information Report.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2146 or section 2146.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2146 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39500, 39600, 39601, 43000.5, 43013, 43018, 43105, 43204, 43205.5 and 43214 Health and Safety Code.
Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2147. Demonstration of Compliance with Emission Standards.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2147 or section 2147.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2147 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39500, 39600, 39601, 43000.5, 43013, 43018, 43105, 43204, 43205.5 and 43214 Health and Safety Code.
Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2148. Evaluation of Need for Recall.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2148 or section 2148.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2148 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39500, 39600, 39601, 43000.5, 43013, 43018, 43105, 43204, 43205.5 and 43214 Health and Safety Code.
Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

§ 2149. Notification and Subsequent Action.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2149 or section 2149.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2149 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39500, 39600, 39601, 43000.5, 43013, 43018, 43105, 43204, 43205.5 and 43214 Health and Safety Code.
Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43018, 43101, 43104, 43105, 43106, 43107, 43204-43205.5, 43211-43213 and 43107, Health and Safety Code.

§ 2166. General Provisions.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2166.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2166 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2166.1. Definitions.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2166.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2166.1 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2167. Required Recall and Corrective Action for Failures of Exhaust After-Treatment Devices, on-Board Computers or Systems, Urea Dosers, Hydrocarbon Injectors, Exhaust Gas Recirculation Valves, Exhaust Gas Recirculation Coolers, Turbochargers, Fuel Injectors.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2167.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2167 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2168. Required Corrective Action and Recall for Emission-Related Component Failures.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2168.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2168 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2169. Required Recall or Corrective Action Plan.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2169.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2169 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2169.1. Approval and Implementation of Corrective Action Plan.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2169.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2169.1 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2169.2. Notification of Owners.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2169.2.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2169.2 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2169.3. Repair Label.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2169.3.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2169.3 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2169.4. Proof of Correction Certificate.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2169.4.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2169.4 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2169.5. Preliminary Tests.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2169.5.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2169.5 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2169.6. Communication with Repair Personnel.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2169.6.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2169.6 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2169.7. Recordkeeping and Reporting Requirements.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2169.7.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2169.7 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2169.8. Extension of Time.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2169.8.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2169.8 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2170. Penalties.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow this section 2170.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2170 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections, 39500, 39600, 39601, 43000.5, 43013, 43018, 43204, 43205.5 and 43214, Health and Safety Code. Engine Mfrs Assn v. California Air Resources Board, (2014) 231 Cal. App.4th 1022. Reference: Sections 43000, 43100, 43101, 43102, 43106, 43107 and 43806, Health and Safety Code.

§ 2317. Satisfaction of Designated Clean Fuel Requirements with a Substitute Fuel.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2317 or section 2317.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2317 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 39600, 39601, 39667, 43013, 43018 and 43101, Health and Safety Code; and Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975). Reference: Sections 39000, 39001, 39002, 39003, 39500, 39515, 39516, 39667, 43000, 43013, 43018 and 43101, Health and Safety Code; and Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975).

§ 2423. Exhaust Emission Standards and Test Procedures — Off-Road Compression-Ignition Engines.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2423 or section 2423.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2423 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

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Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101 and 43104, Health and Safety Code. Reference: Sections 43013, 43017, 43018, 43101, 43104 and 43211-43212, Health and Safety Code.

§ 2485. Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2485 or section 2485.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2485 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

* * * * *

Note: Authority cited: Sections 39600, 39601, 39614(b)(6)(A), 39658, 39667, 43000.5(d), 43013(b), 43013(h), 43018(b) and 43018(c), Health and Safety Code; and Western Oil & Gas Assn. v. Orange County Air Pollution Control Dist. (1975), 14 Cal.3d.411. Reference: Sections 39002, 39003, 39027, 39500, 39600, 39650, 39655, 39656, 39657, 39658, 39659, 39662, 39665, 39674, 39675, 42400, 42400.1, 42400.2, 42400.3, 42402, 42402.1, 42402.2, 42402.3, 42402.4, 42403.5, 42410, 43013, 43018 and 43704, Health and Safety Code; Sections 305, 336, 350, 440, 445, 545, 546, 642, 680, 21400, 22452, 22515, 27153, 40001 and 40001(b)(5), California Vehicle Code; and Sections 1201, 1900, 1962 and 2480, Title 13, California Code of Regulations.

§ 2903. Definitions.

Unless and until a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, regulated parties may choose to follow either this section 2903 or section 2903.0.1.

However, if a court of competent jurisdiction issues a final ruling that H.J. Res. 88 (119th Congress) and H.J. Res. 89 (119th Congress) are invalid or that the waivers U.S. EPA granted California on January 6, 2025, 90 Federal Register 642 and 90 Federal Register 643, are in effect, the regulated parties are subject to the requirements of this section 2903 **beginning with the second full model year after such decision** to the extent consistent with the court's final ruling. Notice of the court's ruling will be posted on CARB's website, <https://arb.ca.gov>.

* * * * *

Note: Authority cited: Sections 39600, 39601, 43019, 43019.1 and 43202.6, Health and Safety Code. Reference: Sections 43000, 43000.5, 43013, 43018, 43019 and 43019.1, Health and Safety Code.

Appendix A-4-2

Proposed Regulation Order: Emergency Vehicle Emissions Regulations

Part II

Adopt New Sections 1900.0.1, 1961.2.1, 1961.3.1,
1962.2.1, 1962.3,1, 1965.0.1, 1969.0.1, 1976.0.1,
1978.0.1, 2037.0.1, 2038.0.1, 2112.0.1, 2139.0.1,
2140.0.1, 2147.0.1, 2317.0.1, 2903.0.1 Title 13,
California Code of Regulations

[Note: The entire text of sections 1900.0.1 through 2903.01 through set forth below is new language in “normal type” proposed to be added to title 13, California Code of Regulations]

Chapter 1. Motor Vehicle Pollution Control Devices

- Section 1900.0.1 Definitions. (Alternative)
- Section 1961.2.1 Exhaust Emission Standards and Test Procedures--2015 through 2025 Model Year Passenger Cars and Light-Duty Trucks, and 2015 through 2028 Model Year Medium-Duty Vehicles. (Alternative)
- Section 1961.3.1 Greenhouse Gas Exhaust Emission Standards and Test Procedures - 2017 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles. (Alternative)
- Section 1962.2.1 Zero-Emission Vehicle Standards for 2018 through 2025 Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles. (Alternative)
- Section 1962.3.1 Electric Vehicle Charging Requirements. (Alternative)
- Section 1965.0.1 Emission Control, Smog Index, and Environmental Performance Labels - 1979 and Subsequent Model-Year Motor Vehicles. (Alternative)
- Section 1969.0.1 Motor Vehicle Service Information--1994 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Engines and Vehicles, and 2007 and Subsequent Model Heavy-Duty Engines. (Alternative)
- Section 1976.0.1 Standards and Test Procedures for Motor Vehicle Fuel Evaporative Emissions. (Alternative)
- Section 1978.0.1 Standards and Test Procedures for Vehicle Refueling Emissions. (Alternative)
- Section 2037.0.1 Defects Warranty Requirements for 1990 and Subsequent Model Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, and Motor Vehicle Engines Used in Such Vehicles. (Alternative)
- Section 2038.0.1 Performance Warranty Requirements for 1990 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and Motor Vehicle Engines Used in Such Vehicles. (Alternative)

Chapter 2. Enforcement of Vehicle Emission Standards and Surveillance Testing

- Section 2112.0.1 Definitions. (Alternative)
- Section 2139.0.1 Testing. (Alternative)
- Section 2140.0.1 Notification and Use of Test Results. (Alternative)
- Section 2147.0.1 Demonstration of Compliance with Emission Standards. (Alternative)

Chapter 8. Clean Fuels Program

Section 2317.0.1 Satisfaction of Designated Clean Fuel Requirements with a Substitute Fuel.
(Alternative)

Chapter 16. Certification Fees for Mobile Sources

Section 2903.0.1 Definitions. (Alternative)

Title 13, California Code of Regulations

Adopt Section 1900.0.1 of title 13, California Code of Regulations, to read as follows:

§ 1900.0.1 Definitions. (Alternative)

- (a) The definitions of this section supplement and are governed by the definitions set forth in chapter 2 (commencing with section 39010), part 1, division 26 of the Health and Safety Code, unless a specific definition set forth therein has been revised in section (b) below to conform to federal law pursuant to Health and Safety Code section 39601. The definitions set forth in the applicable model-year new vehicle certification and assembly-line test procedures adopted in this chapter are hereby incorporated by reference.
- (b) In addition to the definitions incorporated under subdivision (a), the following definitions shall govern the provisions of this chapter;
 - (1) “Add-on part” means any aftermarket part which is not a modified part or a replacement part.
 - (2) “Consolidated part” means a part which is designed to replace a group of original equipment parts and which is functionally identical of those original equipment parts in all respects which in any way affect emissions (including durability).
 - (3) “Emission standard” as it applies to compliance with the requirements applicable to motor vehicles and motor vehicle engines set forth in Article 2, Chapter 1, Division 3 of Title 13, California Code of Regulations, and the associated remedies provided in the Health and Safety Code for noncompliance, means:
 - (a) a numerical limit on the amount of a given pollutant that a motor vehicle or motor vehicle engine may emit into the atmosphere; or
 - (b) a requirement that a motor vehicle or motor vehicle engine be equipped with a certain type of pollution-control device or some other design feature related to the control of emissions.
 - (4) “Evaporative emission standards” are a subset of emission standards that refer to the specific motor vehicle fuel evaporative emission standards and test procedures incorporated by reference in title 13, CCR section 1976 to which a vehicle is certified.
 - (5) “Exhaust emission standards” or “tailpipe emission standards” are a subset of emission standards that collectively refer to the specific standards to which a motor vehicle or motor vehicle engine is certified.

- (6) "Emissions-related part" means any automotive part, which affects any regulated emissions from a motor vehicle which is subject to California or federal emission standards. This includes, at a minimum, those parts specified in the "Emissions-Related Parts List," adopted by the State Board on November 4, 1977, as last amended June 1, 1990.
- (7) "Gaseous fuels" means any liquefied petroleum gas, liquefied natural gas, or compressed natural gas fuels for use in motor vehicles.
- (8) "Heavy-duty engine" means an engine which is used to propel a heavy-duty vehicle.
- (9) "Heavy-duty vehicle" means any motor vehicle having a manufacturer's gross vehicle weight rating greater than 8,500 pounds, except passenger cars.
- (10) "Identical device" means a crankcase emission control device identical in all respects, including design, materials, manufacture, installation and operation, with a device which has been certified by the Air Resources Board or the Motor Vehicle Pollution Control Board pursuant to the Health and Safety Code, but which is manufactured by a person other than original manufacturer of the device.
- (11) "Independent low volume manufacturer" means a manufacturer with California annual sales of less than 10,000 new passenger cars, light-duty trucks and medium-duty vehicles following aggregation of sales pursuant to this section 1900(b)(8). Annual sales shall be determined as the average number of sales sold for the three previous consecutive model years for which a manufacturer seeks certification; however, for a manufacturer certifying for the first time in California, annual sales shall be based on projected California sales for the model year. A manufacturer's California sales shall consist of all vehicles or engines produced by the manufacturer and delivered for sale in California, except that vehicles or engines produced by the manufacturer and marketed in California by another manufacturer under the other manufacturer's nameplate shall be treated as California sales of the marketing manufacturer. The annual sales from different firms shall be aggregated in the following situations: (1) vehicles produced by two or more firms, one of which is 10% or greater part owned by another, except in circumstances for which the Executive Officer determines that 10% or greater ownership by one of the firms does not result in responsibility for overall direction of both firms; or (2) vehicles produced by any two or more firms if a third party has equity ownership of 10% or more in each of the firms; or (3) vehicles produced by two or more firms having a common corporate officer(s) who is (are) responsible for the overall direction of the companies; or (4) vehicles imported or distributed by all firms where the vehicles are manufactured by the same entity and the importer or distributor is an authorized agent of the entity.

- (12) “Intermediate volume manufacturer” means any pre-2001 model year manufacturer with California sales between 3,001 and 60,000 new light- and medium-duty vehicles per model year based on the average number of vehicles sold by the manufacturer each model year from 1989 to 1993; any 2001 through 2002 model year manufacturer with California sales between 4,501 and 60,000 new light- and medium-duty vehicles per model year based on the average number of vehicles sold by the manufacturer each model year from 1989 to 1993; any 2003 through 2017 model year manufacturer with California sales between 4,501 and 60,000 new light- and medium-duty vehicles based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification; and any 2018 and subsequent model year manufacturer with California sales between 4,501 and 20,000 new light- and medium-duty vehicles based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification. For a manufacturer certifying for the first time in California, model year sales shall be based on projected California sales. A manufacturer's California sales shall consist of all vehicles or engines produced by the manufacturer and delivered for sale in California, except that vehicles or engines produced by the manufacturer and marketed in California by another manufacturer under the other manufacturer's nameplate shall be treated as California sales of the marketing manufacturer.

For purposes of applying the 2005 through 2017 model year zero-emission vehicle requirements for intermediate-volume manufacturers under section 1962(b) or 1962.1(b), as applicable, the annual sales from different firms shall be aggregated in the case of (1) vehicles produced by two or more firms, each one of which either has a greater than 50% equity ownership in another or is more than 50% owned by another; or (2) vehicles produced by any two or more firms if a third party has equity ownership of greater than 50% in each firm.

For purposes of applying the 2009 through 2016 model year Greenhouse Gas requirements for intermediate volume manufacturers under section 1961.1, the annual sales from different firms shall be aggregated in the following situations: (1) vehicles produced by two or more firms, each one of which either has a greater than 10% equity ownership in another or is more than 10% owned by another; or (2) vehicles produced by any two or more firms if a third party has equity ownership of greater than 10% in each firm.

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

- (13) "Large volume manufacturer" means any 2000 and subsequent model year manufacturer that is not a small volume manufacturer, or an independent low volume manufacturer, or an intermediate volume manufacturer.
- (14) "Light-duty truck" (LDT) means any 2000 and subsequent model motor vehicle certified to the standards in section 1961(a)(1), or 1961.2 rated at 8,500 pounds gross vehicle weight or less, and any other motor vehicle, rated at 6,000 pounds gross vehicle weight or less, which is designed primarily for purposes of transportation of property or is a derivative of such a vehicle, or is available with special features enabling off-street or off-highway operation and use.
- (15) "Medium-duty passenger vehicle" (MDPV) means any medium-duty vehicle with a gross vehicle weight rating of less than 10,000 pounds that is designed primarily for the transportation of persons. The medium-duty passenger vehicle definition does not include any vehicle which: (1) is an "incomplete truck" i.e., is a truck that does not have the primary load carrying device or container attached; or (2) has a seating capacity of more than 12 persons; or (3) is designed for more than 9 persons in seating rearward of the driver's seat; or (4) is equipped with an open cargo area of 72.0 inches in interior length or more. A covered box not readily accessible from the passenger compartment will be considered an open cargo area, for purposes of this definition.

- (16) “Medium-duty vehicle” (MDV) means any pre-1995 model year heavy-duty vehicle having a manufacturer's gross vehicle weight rating of 8,500 pounds or less; any 1992 through 2006 model-year heavy-duty low- emission, ultra-low-emission, super-ultra-low-emission or zero-emission vehicle certified to the standards in section 1960.1(h)(2) having a manufacturer's gross vehicle weight rating of 14,000 pounds or less; any 1995 through 2003 model year heavy-duty vehicle certified to the standards in section 1960.1(h)(1) having a manufacturer's gross vehicle weight rating of 14,000 pounds or less; and any 2000 and subsequent model heavy-duty low-emission, ultra-low-emission, super-ultra-low- emission or zero-emission vehicle certified to the standards in section 1961(a)(1), 1961.2, 1962, 1962.1, or 1962.2 having a manufacturer's gross vehicle weight rating between 8,501 and 14,000 pounds.
- (17) “Modified part” means any aftermarket part intended to replace an original equipment emission-related part and which is not functionally identical to the original equipment part in all respects which in any way affect emissions, excluding a consolidated part.
- (18) “Motorcycle Engine” means an engine which is used to propel a new, street-use motorcycle.
- (19) [Reserved]
- (20) “Passenger car” (PC) means any motor vehicle designed primarily for transportation of persons and having a design capacity of twelve persons or less.
- (21) “Reactivity adjustment factor” means a fraction applied to the non-methane organic gases (NMOG) emissions from a vehicle powered by a fuel other than conventional gasoline for the purpose of determining a gasoline-equivalent NMOG level. The reactivity adjustment factor is defined as the ozone-forming potential of clean fuel vehicle exhaust divided by the ozone-forming potential of gasoline vehicle exhaust.
- (22) “Recall” means:
- (A) The issuing of notices directly to consumers that vehicles in their possession or control should be corrected, and/or
 - (B) Efforts to actively locate and correct vehicles in the possession or control of consumers.
- (23) “Replacement part” means any aftermarket part intended to replace an original equipment emissions-related part and which is functionally identical to the original equipment part in all respects which in any way affect emissions (including durability), or a consolidated part.

- (24) "Subgroup" means a set of vehicles within an engine family distinguishable by characteristics contained in the manufacturer's application for certification.
- (25) "Small volume manufacturer" means, with respect to the 2001 and subsequent model-years, a manufacturer with California sales less than 4,500 new passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles and heavy-duty engines based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification as a small volume manufacturer; however, for manufacturers certifying for the first time in California model-year sales shall be based on projected California sales. A manufacturer's California sales shall consist of all vehicles or engines produced by the manufacturer and delivered for sale in California, except that vehicles or engines produced by the manufacturer and marketed in California by another manufacturer under the other manufacturer's nameplate shall be treated as California sales of the marketing manufacturer. Except as provided in the next paragraph, for the 2009 through 2017 model years, the annual sales from different firms shall be aggregated in the following situations: (1) vehicles produced by two or more firms, one of which is 10% or greater part owned by another; or (2) vehicles produced by any two or more firms if a third party has equity ownership of 10% or more in each of the firms; or (3) vehicles produced by two or more firms having a common corporate officer(s) who is (are) responsible for the overall direction of the companies; or (4) vehicles imported or distributed by any firms where the vehicles are manufactured by the same entity and the importer or distributor is an authorized agent of the entity. Notwithstanding the provisions of this paragraph, upon application to the Executive Officer, a manufacturer may be classified as a "small volume manufacturer" for the 2013 through 2017 model years if the Executive Officer determines that it is operationally independent of the firm that owns 10% or more of the applicant or has a greater than 10% equity ownership in the applicant based on the criteria provided in the last paragraph of this subsection (b)(22).

For purposes of compliance with the zero-emission vehicle requirements, heavy-duty vehicles and engines shall not be counted as part of a manufacturer's sales. For purposes of applying the 2005 through 2017 model year zero-emission vehicle requirements for small-volume manufacturers under sections 1962(b) and 1962.1(b), the annual sales from different firms shall be aggregated in the case of (1) vehicles produced by two or more firms, each one of which either has a greater than 50% equity ownership in another or is more than 50% owned by another; or (2) vehicles produced by any two or more firms if a third party has equity ownership of greater than 50% in each firm. Notwithstanding the provisions of this paragraph, upon application to the Executive Officer, a manufacturer may be classified as a "small volume manufacturer" for the 2013 through 2017 model years if the Executive Officer determines that it is operationally independent of the firm that owns 50% or more of the applicant or has a greater than 50% equity ownership in the applicant based on the criteria provided in the last paragraph of this subsection (b)(22).

Except as provided in the next paragraph, for the 2018 and subsequent model years, the annual sales from different firms shall be aggregated in the following situations: (1) vehicles produced by two or more firms, one of which is 33.4% or greater part owned by another; or (2) vehicles produced by any two or more firms if a third party has equity ownership of 33.4% or more in each of the firms; or (3) vehicles produced by two or more firms having a common corporate officer(s) who is (are) responsible for the overall direction of the companies; or (4) vehicles imported or distributed by any firms where the vehicles are manufactured by the same entity and the importer or distributor is an authorized agent of the entity. Notwithstanding the provisions of this paragraph, upon application to the Executive Officer, a manufacturer may be classified as a "small volume manufacturer" for the 2018 and subsequent model years if the Executive Officer determines that it is operationally independent of the firm that owns 33.4% or more of the applicant or has a greater than 33.4% equity ownership in the applicant based on the criteria provided in the last paragraph of this subsection (b)(22).

For the purposes of this paragraph, all manufacturers whose annual sales are aggregated together under the provisions of this subsection (b)(22) shall be defined as “related manufacturers.” Notwithstanding such aggregation, the Executive Officer may make a determination of operational independence if all of the following criteria are met for at least 24 months preceding the application submittal: (1) for the three years preceding the year in which the initial application is submitted, the average California sales for the applicant does not exceed 4,500 vehicles per year; (2) no financial or other support of economic value is provided by related manufacturers for purposes of design, parts procurement, R&D and production facilities and operation, and any other transactions between related manufacturers are conducted under normal commercial arrangements like those conducted with other parties, at competitive pricing rates to the manufacturer; (3) related manufacturers maintain separate and independent research and development, testing, and production facilities; (4) the applicant does not use any vehicle powertrains or platforms developed or produced by related manufacturers; (5) patents are not held jointly with related manufacturers; (6) related manufacturers maintain separate business administration, legal, purchasing, sales, and marketing departments, as well as autonomous decision-making on commercial matters; (7) the overlap of the Board of Directors between related manufacturers is limited to 25% with no sharing of top operational management, including president, chief executive officer, chief financial officer, and chief operating officer, and provided that no individual overlapping director or combination of overlapping directors exercises exclusive management control over either or both companies; and (8) parts or components supply between related companies must be established through open market process, and to the extent that the manufacturer sells parts/components to non-related manufacturers, it does so through the open market a competitive pricing. Any manufacturer applying for operational independence must submit to ARB an Attestation Engagement from an independent certified public accountant or firm of such accountants verifying the accuracy of the information contained in the application, as defined by and in accordance with the procedures established in 40 C.F.R. § 80.125, as last amended January 19, 2007, which is incorporated herein by reference. The applicant must submit information to update any of the above eight criteria as material changes to any of the criteria occur. If there are no material changes to any of the criteria, the applicant must certify that to the Executive Officer annually. With respect to any such changes, the Executive Officer may consider extraordinary conditions (e.g., changes to economic conditions, unanticipated market changes, etc.) and may continue to find the applicant to be operationally independent. In the event that a manufacturer loses eligibility as a “small volume manufacturer” after a material change occurs, the manufacturer must begin compliance with the primary emissions program in the third model year after the model year in which the

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

Note: Authority cited: Sections 39010, 39600, 39601, 43013, 43018, 43101 and 43104, Health and Safety Code. Reference: Sections 39002, 39003, 39010, 39500, 40000, 43000, 43013, 43018.5, 43100, 43101, 43101.5, 43102, 43103, 43104, 43106 and 43204, Health and Safety Code; and Section 27156, Vehicle Code.

Title 13, California Code of Regulations

Adopt Section 1961.2.1 of title 13, California Code of Regulations, to read as follows:

§ 1961.2.1. Exhaust Emission Standards and Test Procedures - 2015 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles. (Alternative)

Note: Auto Innovators requests CARB allow test fuel reciprocity between CARB LEV III test fuel and CARB LEV IV test fuel for LEV III and LEV IV emission standards. There is no adverse emissions impact between the two fuels so they should be treated as equivalent when certifying to either LEV III or LEV IV.

Introduction. This section 1961.2.1 contains the California “LEV III” exhaust emission standards for 2015 and subsequent model year passenger cars, light-duty trucks, and medium-duty vehicles. A manufacturer must demonstrate compliance with the exhaust standards in subsection (a) applicable to specific test groups, and with the composite phase-in requirements in subsection (b) applicable to the manufacturer’s entire fleet.

Before the 2015 model year, a manufacturer that produces vehicles that meet the standards in subsection (a) has the option of certifying the vehicles to those standards, in which case the vehicles will be treated as LEV III vehicles for purposes of the fleet-wide phase-in requirements. Similarly, 2015 - 2019 model-year vehicles may be certified to the “LEV II” exhaust emission standards in subsection 1961(a)(1), in which case the vehicles will be treated as LEV II vehicles for purposes of the fleet-wide phase-in requirements.

A manufacturer has the option of certifying engines used in incomplete and diesel medium-duty vehicles with a gross vehicle weight rating of greater than 10,000 lbs. GVW to the heavy duty engine standards and test procedures set forth in title 13, CCR, subsections 1956.8(c) and (h).

All medium-duty vehicles with a gross vehicle weight rating of less than or equal to 10,000 lbs. GVW, including incomplete otto-cycle medium-duty vehicles and medium-duty vehicles that use diesel cycle engines, must be certified to the LEV III chassis standards and test procedures set forth in this section in 2020 and subsequent model years.

Pooling Provision.

For each model year, a manufacturer must demonstrate compliance with this section 1961.2.1 based on one of two options applicable throughout the model year, either:

Option 1: the total number of passenger cars, light-duty trucks, and medium-duty vehicles that are certified to the California exhaust emission standards in subsection (a) and subsection 1961(a)(1), and are produced and delivered for sale in California; or

Option 2: the total number of passenger cars, light-duty trucks, and medium-duty vehicles that are certified to the California exhaust emission standards in subsection (a) and subsection 1961(a)(1), and are produced and delivered for sale in California, the

District of Columbia, and all states that have adopted California's criteria pollutant emission standards set forth in this section for that model year pursuant to section 177 of the federal Clean Air Act (42 U.S.C. § 7507).

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

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

(a) Exhaust Emission Standards.

- (1) *“LEV III” Exhaust Standards.* The following standards are the maximum exhaust emissions for the full useful life from new 2015 and subsequent model year “LEV III” passenger cars, light-duty trucks, and medium-duty vehicles, including fuel-flexible, bi-fuel and dual-fuel vehicles when operating on the gaseous or alcohol fuel they are designed to use. 2015 – 2019 model-year LEV II LEV vehicles may be certified to the 150,000 mile non-methane organic gas plus oxides of nitrogen (NMOG+NOx) emission standards for LEV160, LEV395, or LEV630, as applicable, in this subsection (a)(1) and the corresponding NMOG+NOx numerical values in subsection (a)(4), in lieu of the separate NMOG and NOx exhaust emission standards in subsection 1961(a)(1) and the corresponding NMOG numerical values in subsection 1961(a)(4) and LEV II ULEV vehicles may be certified to the 150,000 mile NMOG+NOx emission standards for ULEV125, ULEV340, or ULEV570, as applicable, in this subsection (a)(1) and the corresponding NMOG+NOx numerical values in subsection (a)(4), in lieu of the separate NMOG and NOx exhaust emission standards in subsection 1961(a)(1) and the corresponding NMOG numerical values in subsection 1961(a)(4). 2015 – 2019 model-year LEV II SULEV vehicles that receive a partial ZEV allowance in accordance with the “California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes” and 2015 – 2016 model year vehicles that are allowed to certify to LEV II SULEV standards using “carryover” of emission test data under the provisions in subsection (b)(2) may be certified to the 150,000 mile NMOG+NOx emission standards for SULEV30, SULEV170, or SULEV230, as applicable, in this subsection (a)(1) and the corresponding NMOG+NOx numerical values in subsection (a)(4), in lieu of the separate NMOG and NOx exhaust emission standards in subsection 1961(a)(1) and the corresponding NMOG numerical values in subsection 1961(a)(4). LEV II SULEV vehicles that do not either receive a partial ZEV allowance or (2) certify to LEV II SULEV standards in the 2015 – 2016 model years using “carryover” of emission test data may not certify to combined NMOG+NOx standards. LEV II vehicles that certify to

combined NMOG+NOx standards will be treated as LEV II vehicles for purposes of the fleet-wide phase-in requirements.

LEV III Exhaust Mass Emission Standards for New 2015 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles³						
<i>Vehicle Type</i>	<i>Durability Vehicle Basis (mi)</i>	<i>Vehicle Emission Category²</i>	<i>NMOG + Oxides of Nitrogen⁴ (g/mi)</i>	<i>Carbon Monoxide (g/mi)</i>	<i>Formaldehyde (mg/mi)</i>	<i>Particulates¹ (g/mi)</i>
All PCs; LDTs 8500 lbs. GVWR or less; and MDPVs Vehicles in this category are tested at their loaded vehicle weight	150,000	LEV160	0.160	4.2	4	0.01
		ULEV125	0.125	2.1	4	0.01
		ULEV70	0.070	1.7	4	0.01
		ULEV50	0.050	1.7	4	0.01
		SULEV30	0.030	1.0	4	0.01
		SULEV20	0.020	1.0	4	0.01
MDVs 8501 - 10,000 lbs. GVWR, excluding MDPVs Vehicles in this category are tested at their adjusted loaded vehicle weight	150,000	LEV395 ^{5,6}	0.395	6.4	6	0.12
		ULEV340 ^{5,6}	0.340	6.4	6	0.06
		ULEV250	0.250	6.4	6	0.06
		ULEV200	0.200	4.2	6	0.06
		SULEV170	0.170	4.2	6	0.06
		SULEV150	0.150	3.2	6	0.06
MDVs 10,001-14,000 lbs. GVWR Vehicles in this category are tested at their adjusted loaded vehicle weight	150,000	LEV630 ^{5,6}	0.630	7.3	6	0.12
		ULEV570 ^{5,6}	0.570	7.3	6	0.06
		ULEV400	0.400	7.3	6	0.06
		ULEV270	0.270	4.2	6	0.06
		SULEV230	0.230	4.2	6	0.06
		SULEV200	0.200	3.7	6	0.06

¹ These standards shall apply only to vehicles not included in the phase-in of the particulate standards set forth in subsection (a)(2).

² The numeric portion of the category name is the NMOG+NOx value in thousandths of grams per mile.

³ These standards apply at both low altitude and high altitude except as noted in footnote 4.

⁴ The LEV III NMOG+NOx 150,000-mile exhaust mass emission standards for passenger cars and light-duty trucks that apply at high-altitude conditions are: 0.160 g/mi for LEV160 and ULEV125; 0.105 g/mi for ULEV70; 0.070 g/mi for ULEV50; and 0.050 g/mi for SULEV30 and SULEV20.

⁵ These vehicle emission categories are only applicable for the 2015 through 2021 model years.

⁶ The following NOx standards also apply for certification testing with emission-data vehicles:
0.2 g/mi for LEV395 and ULEV340; 0.4 g/mi for LEV630 and ULEV570.

(2) “LEV III” Particulate Standards.

- (A) *Particulate Standards for Passenger Cars, Light-Duty Trucks, and Medium- Duty Passenger Vehicles.* Beginning in the 2017 model year, a manufacturer, except a small volume manufacturer, shall certify a percentage of its passenger car, light-duty truck, and medium-duty passenger vehicle fleet to the following particulate standards according to the following phase-in schedule. These standards are the maximum particulate emissions allowed at full useful life. All vehicles certifying to these particulate standards must certify to the LEV III exhaust emission standards set forth in subsection (a)(1).

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

- (B) Particulate Standards for Medium-Duty Vehicles Other than Medium-Duty Passenger Vehicles.

- Beginning in the 2017 model year, a manufacturer, except a small volume manufacturer, shall certify a percentage of its medium-duty vehicle fleet to the following particulate standards. These standards are the maximum particulate emissions allowed at full useful life. All vehicles certifying to these particulate standards must certify to the LEV III exhaust emission standards set forth in subsection (a)(1). This subsection (a)(2)(B)1 shall not apply to medium-duty passenger vehicles.

LEV III Particulate Emission Standard Values for Medium-Duty Vehicles, Other than Medium-Duty Passenger Vehicles	
Vehicle Type¹	Particulates (mg/mi)
MDVs 8501 - 10,000 lbs. GVWR, excluding MDPVs	8
MDVs 10,001 - 14,000 lbs. GVWR	10

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

- A manufacturer of medium-duty vehicles, except a small volume manufacturer, shall certify at least the following percentage of its medium-duty vehicle fleet to the particulate standards in subsection (a)(2)(B)1 according to the following phase-in schedule. This subsection (a)(2)(B)2 shall not apply to medium-duty passenger vehicles.

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

- (C) *Particulate Standards for Small Volume Manufacturers.* In the 2021 through 2027 model years, a small volume manufacturer shall certify 100 percent of its passenger car, light-duty truck, and medium-duty passenger vehicle fleet to the 3 mg/mi particulate standard. In the 2028 and subsequent model years, a small volume manufacturer shall certify 100 percent of its passenger car, light-duty truck, and medium-duty passenger vehicle fleet to the 1 mg/mi particulate standard. In the 2021 and subsequent model years, a small volume manufacturer shall certify 100 percent of its medium-duty vehicles 8501 - 10,000 lbs. GVWR, excluding MDPVs, to the 8 mg/mi particulate standard. In the 2021 and subsequent model years, a small volume manufacturer shall certify 100 percent of its medium-duty vehicles 10,001 - 14,000 lbs. GVWR to the 10 mg/mi particulate standard. These standards are the maximum particulate emissions allowed at full useful life. All vehicles certifying to these particulate standards must certify to the LEV III exhaust emission standards set forth in subsection (a)(1).
- (D) Alternative Phase-in Schedule for Particulate Standards.
1. *Alternative Phase-in Schedules for the 3 mg/mi Particulate Standard for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.* A manufacturer may use an alternative phase-in schedule to comply with the 3 mg/mi particulate standard phase-in requirements as long as: (1) the percent of PC+LDT+MDPV vehicles meeting the 3 mg/mi particulate standard in the 2019 model year is greater than or equal to the highest percent of PC+LDT+MDPV vehicles meeting the 3 mg/mi particulate standard in the 2016, 2017, and 2018 model years individually; the percent of PC+LDT+MDPV vehicles meeting the 3 mg/mi particulate standard in the 2020 model year is greater than or equal to the highest percent of PC+LDT+MDPV vehicles meeting the 3 mg/mi particulate standard in the 2016, 2017, and 2018 model years individually; and (3) equivalent PM emission reductions are achieved by the 2021 model year from passenger cars, light-duty trucks, and medium-duty passenger vehicles. Model year emission reductions shall be calculated by multiplying the percent of PC+LDT+MDPV vehicles meeting the 3 mg/mi particulate standard in a given model year (based on a manufacturer's projected sales volume of vehicles in each category) by 5 for the 2017 model year, 4 for the 2018 model year, 3 for the 2019 model year, 2 for the 2020 model year, and 1 for the 2021 model year. The yearly results for PC+LDT+MDPV vehicles shall be summed together to determine a cumulative total for PC+LDT+MDPV vehicles. In the 2021 model year, the

cumulative total must be equal to or greater than 490, and 100 percent of the manufacturer's passenger cars, light-duty trucks, and medium-duty passenger vehicles must be certified to the 3 mg/mi particulate standard, to be considered equivalent. A manufacturer may add vehicles introduced before the 2017 model year (e.g., the percent of vehicles introduced in 2016 would be multiplied by 5) to the cumulative total.

2. *Alternative Phase-in Schedules for the 1 mg/mi Particulate Standard for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.* A manufacturer may use an alternative phase-in schedule to comply with the 1 mg/mi particulate standard phase-in requirements as long as equivalent PM emission reductions are achieved by the 2028 model year from passenger cars, light-duty trucks, and medium-duty passenger vehicles. Model year emission reductions shall be calculated by multiplying the percent of PC+LDT+MDPV vehicles meeting the 1 mg/mi particulate standard in a given model year (based on a manufacturer's projected sales volume of vehicles in each category) by 4 for the 2025 model year, 3 for the 2026 model year, 2 for the 2027 model year, and 1 for the 2028 model year. The yearly results for PC+LDT+MDPV vehicles shall be summed together to determine a cumulative total for PC+LDT+MDPV vehicles. In the 2028 model year, the cumulative total must be equal to or greater than 500, and 100 percent of the manufacturer's passenger cars, light-duty trucks, and medium-duty passenger vehicles must be certified to the 1 mg/mi particulate standard to be considered equivalent. A manufacturer may add vehicles introduced before the 2025 model year (e.g., the percent of vehicles introduced in 2024 would be multiplied by 4) to the cumulative total.

3. Alternative Phase-in Schedules for the Particulate Standards for Medium-Duty Vehicles Other than Medium-Duty Passenger Vehicles. A manufacturer may use an alternative phase-in schedule to comply with the particulate standard phase-in requirements as long as equivalent PM emission reductions are achieved by the 2021 model year from medium-duty vehicles other than medium-duty passenger vehicles. Model year emission reductions shall be calculated by multiplying the total percent of MDVs certified to the 8 mg/mi PM standard or to the 10 mg/mi PM standard, as applicable, in a given model year (based on a manufacturer's projected sales volume of vehicles in each category) by 5 for the 2017 model year, 4 for the 2018 model year, 3 for the 2019 model year, 2 for the 2020 model year, and 1 for the 2021 model year. The yearly results for MDVs shall be summed together to determine a cumulative total for MDVs. In the 2021 model year, the cumulative total must be equal to or greater than 490, and 100 percent of the manufacturer's MDVs must be certified to the 8 mg/mi PM standard or to the 10 mg/mi PM standard, as applicable, to be considered equivalent. A manufacturer may add vehicles introduced before the 2017 model year (e.g., the percent of vehicles introduced in 2016 would be multiplied by 5) to the cumulative total.
- (3) *NMOG+NO_x Standards for Bi-Fuel, Fuel-Flexible, and Dual-Fuel Vehicles.* For fuel-flexible, bi-fuel, and dual-fuel PCs, LDTs and MDVs, compliance with the NMOG+NO_x exhaust mass emission standards must be based on exhaust emission tests both when the vehicle is operated on the gaseous or alcohol fuel it is designed to use, and when the vehicle is operated on gasoline. A manufacturer must demonstrate compliance with the applicable exhaust mass emission standards for NMOG+NO_x, CO, and formaldehyde set forth in the table in subsection (a)(1) when certifying the vehicle for operation on the gaseous or alcohol fuel, as applicable, and on gasoline or diesel, as applicable.
- A manufacturer may measure non-methane hydrocarbons (NMHC) in lieu of NMOG when fuel-flexible, bi-fuel and dual-fuel vehicles are operated on gasoline, in accordance with the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles." Testing at 50°F is not required for fuel-flexible, bi-fuel, and dual- fuel vehicles when operating on gasoline.

- (4) **50°F Exhaust Emission Standards.** All passenger cars, light-duty trucks, and medium-duty vehicles, other than natural gas and diesel-fueled vehicles, must demonstrate compliance with the following 4,000-mile exhaust emission standards for NMOG+NO_x and formaldehyde (HCHO) measured on the FTP (40 CFR, Part 86, Subpart B) conducted at a nominal test temperature of 50°F, as modified by Part II, Section D of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.” A manufacturer may demonstrate compliance with the NMOG+NO_x and HCHO certification standards contained in this subparagraph by measuring NMHC exhaust emissions or issuing a statement of compliance for HCHO in accordance with Section D.10 and Section G.3.1.2, respectively, of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.” Emissions of carbon monoxide (CO) measured at 50°F at 4,000 miles shall not exceed the standards set forth in subsection (a)(1) applicable to vehicles of the same emission category and vehicle type subject to a cold soak and emission test at 68° to 86° F.

- (A) Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles Certified to the LEV III Standards.

50°F Exhaust Emission Standards for LEV III Passenger Cars, Light- Duty Trucks, and Medium-Duty Passenger Vehicles			
<i>Vehicle Emission Category</i>	<i>NMOG + NO_x (g/mi)</i>		<i>HCHO (g/mi)</i>
	Gasoline	Alcohol Fuel	Both Gasoline and Alcohol Fuel
LEV160	0.320	0.320	0.030
ULEV125	0.250	0.250	0.016
ULEV70	0.140	0.250	0.016
ULEV50	0.100	0.140	0.016
SULEV30	0.060	0.125	0.008
SULEV20	0.040	0.075	0.008

- (B) Standards for Medium-Duty Vehicles (Excluding MDPVs) Certified to the LEV III Standards.

50°F Exhaust Emission Standards for LEV III Medium-Duty Vehicles (Excluding MDPVs)			
<i>Vehicle Emission Category</i>	<i>NMOG + NO_x</i> <i>(g/mi)</i>		<i>HCHO</i> <i>(g/mi)</i>
	Gasoline	Alcohol Fuel	Both Gasoline and Alcohol Fuel
LEV395	0.790	0.790	0.064
ULEV340	0.680	0.680	0.032
ULEV250	0.500	0.500	0.032
ULEV200	0.400	0.500	0.016
SULEV170	0.340	0.425	0.016
SULEV150	0.300	0.375	0.016
LEV630	1.260	1.260	0.080
ULEV570	1.140	1.140	0.042
ULEV400	0.800	0.800	0.042
ULEV270	0.540	0.675	0.020
SULEV230	0.460	0.575	0.020
SULEV200	0.400	0.500	0.020

- (5) *Cold CO Standard.* The following standards are the 50,000 mile cold temperature exhaust carbon monoxide emission levels from new 2015 and subsequent model-year passenger cars, light-duty trucks, and medium-duty passenger vehicles:

2015 AND SUBSEQUENT MODEL-YEAR COLD TEMPERATURE CARBON MONOXIDE
EXHAUST EMISSIONS STANDARDS FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND
MEDIUM-DUTY PASSENGER VEHICLES

(grams per mile)

<i>Vehicle Type</i>	<i>Carbon Monoxide</i>
All PCs, LDTs 0-3750 lbs. LVW;	10.0
LDTs, 3751 lbs. LVW - 8500 lbs. GVWR; MDPVs 10000 lbs. GVWR and less	12.5

These standards apply to vehicles tested at a nominal temperature of 20°F (-7°C) in accordance with 40 CFR Part 86 Subpart C, as amended by the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.” Natural gas, diesel-fueled and zero-emission vehicles are exempt from these standards.

- (6) *Highway NMOG + NO_x Standard.* The maximum emissions of non-methane organic gas plus oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600 Subpart B or 40 CFR §1066.840), as modified by the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” must not be greater than the applicable LEV III NMOG+NO_x standard set forth in subsection (a)(1). Both the sum of the NMOG+NO_x emissions and the HWFET standard must be rounded in accordance with ASTM E29-67 to the nearest 0.001 g/mi before being compared.
- (7) Supplemental Federal Test Procedure (SFTP) Off-Cycle Emission Standards.
 - (A) *SFTP NMOG+NO_x and CO Exhaust Emission Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.* Manufacturers shall certify 2015 and subsequent model year LEVs, ULEVs, and SULEVs in the PC, LDT, and MDPV classes to either the *SFTP NMOG+NO_x and CO Stand-Alone Exhaust Emission Standards* set forth in subsection (a)(7)(A)1, or in accordance with the *SFTP NMOG+NO_x and CO Composite Exhaust Emission Standards and Fleet-Average Requirements* set forth in subsection (a)(7)(A)2. A manufacturer may also certify 2014 model LEVs, ULEVs, or SULEVs in the PC, LDT, or MDPV classes to LEV III SFTP standards, in which case, the manufacturer shall be subject to the LEV III SFTP emission standards and requirements, including the sales-weighted fleet- average NMOG+NO_x composite emission standard applicable to 2015 model vehicles if choosing to comply with the *SFTP NMOG+NO_x and CO Composite Exhaust Emission Standards and Fleet-Average Requirements* set forth in subsection (a)(7)(A)2. The manufacturer shall notify the Executive Officer of its selected emission standard type in the Application for Certification of the first test group certifying to SFTP NMOG+NO_x and CO emission standards on a 150,000 mile durability basis. Once an emission standard type for NMOG+NO_x and CO is selected for a fleet, and

the Executive Officer is notified of such selection, the selection must be kept through the 2025 model year for the entire fleet, which includes LEV II vehicles if selecting to comply with subsection (a)(7)(A)2. The manufacturer may not change its selection until the 2026 model year. Test groups not certifying to the 150,000-mile SFTP NMOG+NO_x and CO emission standards pursuant to this subsection (a)(7)(A) shall be subject to the 4,000-mile SFTP NMOG+NO_x and CO emission standards set forth in subsection 1960.1(r).

1. **SFTP NMOG+NO_x and CO Exhaust Stand-Alone Emission Standards.** The following standards are the maximum SFTP NMOG+NO_x and CO exhaust emissions through full useful life from 2015 and subsequent model-year LEV III LEVs, ULEVs, and SULEVs when operating on the same gaseous or liquid fuel they use for FTP certification. These standards only apply to 2015 through 2016 model year fuel-flexible vehicles ≤ 6,000 lbs. GVWR and 2015 through 2017 model year fuel-flexible vehicles > 6,000 lbs. GVWR when operating on the LEV III certification gasoline specified in Part II, Section A.100.3.1.2 of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.” 2017 and subsequent model year multi-fueled vehicles (including bi-fueled, dual-fueled and fuel-flexible vehicles) ≤ 6,000 lbs. GVWR as well as 2018 and subsequent model year multi-fueled vehicles > 6,000 lbs. GVWR, including vehicles certifying with carryover data, shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of fuel-flexible vehicles).

SFTP NMOG+NO_x and CO Stand-Alone Exhaust Emission Standards for 2015 and Subsequent Model LEV III Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles						
<i>Vehicle Type</i>	<i>Durability Vehicle Basis (mi)</i>	<i>Vehicle Emission Category¹</i>	<i>US06 Test (g/mi)</i>		<i>SC03 Test</i>	
			<i>NMOG + NO_x</i>	<i>CO</i>	<i>NMOG + NO_x</i>	<i>CO</i>
All PCs; LDTs 0- 8,500 lbs. GVWR; and MDPVs		LEV	0.140	9.6	0.100	3.2

Vehicles in these categories are tested at their loaded weight plus 300 pounds).	150,000	ULEV	0.12	9.	0.07	3.
		SULEV (Option A) ²	0.060	9.6	0.020	3.2
		SULEV	0.050	9.6	0.020	3.2

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

LEV emission standards in this table, all LEV III ULEVs certified to 150,000-mile FTP emission standards shall comply with the SFTP ULEV emission standards in this table, and all LEV III SULEVs certified to 150,000-mile FTP emission standards shall comply with the SFTP SULEV emission standards in this table.

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

2. *SFTP NMOG+NOx and CO Composite Exhaust Emission Standards.* For the 2015 and subsequent model years, a manufacturer selecting this option must certify LEV II and LEV III LEVs, ULEVs, and SULEVs, such that the manufacturer's sales-weighted fleet-average NMOG+NOx composite emission value does not exceed the applicable NMOG+NOx composite emission standard set forth in the following table. In addition, the CO composite emission value of any LEV III test group shall not exceed the CO composite emission standard set forth in the following table. SFTP compliance shall be demonstrated using the same gaseous or liquid fuel used for FTP certification. These standards only apply to 2015 through 2016 model year fuel-flexible vehicles $\leq 6,000$ lbs. GVWR and 2015 through 2017 model year fuel-flexible vehicles $> 6,000$ lbs. GVWR when operating on the LEV III certification gasoline specified in Part II, Section A.100.3.1.2 of the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles." 2017 and subsequent model year multi-fueled vehicles (including bi-fueled, dual-fueled and fuel-flexible vehicles) $\leq 6,000$ lbs. GVWR as well as 2018 and subsequent model year multi-fueled vehicles $> 6,000$ lbs. GVWR, including vehicles certifying with carryover data, shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of fuel-flexible vehicles).

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

$$\text{Composite Emission Value} = 0.28 \times \text{US06} + 0.37 \times \text{SC03} + 0.35 \times \text{FTP} \text{ [Eq. 1]}$$

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

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

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

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

SFTP NMOG+NOx and CO Composite Emission Standards for 2015 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles (g/mi) ¹											
Model Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025+
All PCs; LDTs 8,500 lbs. GVWR or less; and MDPVs ³ Vehicles in this category are tested at their loaded vehicle weight (curb weight plus 300 pounds) except LEV II vehicles, which are subject to the test weights specified in §1960.1(r), title 13, CCR.	Sales-Weighted Fleet Average NMOG+NOx Composite Exhaust Emission Standards^{2,4,5,6}										
	0.140	0.110	0.103	0.097	0.090	0.083	0.077	0.070	0.063	0.057	0.050
	CO Composite Exhaust Emission Standard⁷										
	4.2										

¹ **Mileage for Compliance.** All test groups certifying to LEV III FTP emission standards on a 150,000-mile durability basis shall also certify to the SFTP on a 150,000-mile durability basis, as tested in accordance with the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium- Duty Vehicles."

- ² *Determining NMOG+NOx Composite Emission Values of LEV II Test Groups and Cleaner Federal Vehicles.* For test groups certified to LEV II FTP emission standards, SFTP emission values shall be converted to NMOG+NOx and projected out to the same full useful life mileage as their LEV II FTP certification, 120,000 miles or 150,000 miles using deterioration factors or aged components. In lieu of deriving a deterioration factor specific to SFTP test cycles, carry-over LEV II test groups may use the applicable deterioration factor from the FTP cycle in order to determine the carry-over composite emission values for the purpose of the NMOG+NOx sales-weighted fleet-average calculation. If an SFTP full-useful life emission value is used to comply with the LEV II SFTP 4k standards, that value may be used in the sales-weighted fleet-average without applying an additional deterioration factor. For federally-certified test groups certifying in California in accordance with Section H.1.4 of the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," the full-useful life emission value used to comply with federal full-useful life SFTP requirements may be used in the sales-weighted fleet-average without applying an additional deterioration factor. For gasoline-fueled vehicles, NMHC emission values for the US06 and SC03 test cycles shall be converted to NMOG emission values by multiplying by a factor of 1.03. LEV II test groups that contain vehicles at or below 6,000 lbs. GVWR shall certify to SFTP bins as described in footnote 4 at the same full useful life mileage as their LEV II FTP certification starting model year 2017 and in each subsequent model year, thereafter. LEV II test groups that only contain vehicles above 6,000 lbs. GVWR shall certify to SFTP bins as described in footnote 4 at the same full useful life mileage as their LEV II FTP certification starting model year 2018 and in each subsequent model year, thereafter. Test groups certifying to bins shall be subject to the in-use requirements in section (a)(8)(c).
- ³ MDPVs are excluded from SFTP NMOG+NOx and CO emission standards and the sales-weighted fleet average until they are certified to LEV III FTP 150,000-mile NMOG+NOx and CO requirements.
- ⁴ LEV III test groups shall certify to bins in increments of 0.010 g/mi. Beginning with the 2018 model year, vehicles may not certify to bin values above a maximum of 0.180 g/mi.
- ⁵ *Calculating the sales-weighted average for NMOG+NOx.* For each model year, the manufacturer shall calculate and report to the Executive Officer, its sales-weighted fleet-average NMOG+NOx composite emission value as follows.

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

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

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

"Composite Value of Bin" = the numerical value selected by the manufacturer for the certification bin that serves as the emission standard for the vehicles in the test group with respect to all testing for test groups certifying to SFTP on a 150,000-mile durability basis, and the SFTP carry-over composite emission value, as described in footnote 2 of this table, for carry-over LEV II test groups. For each test group, the manufacturer shall report to the Executive Officer the composite value of bin and the number of vehicles within the test group.

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

[(NMOG+NOx Composite Emission Standard) – (Manufacturer's Sales-Weighted Fleet-Average Composite Emission Value)]

x (Total Number of Vehicles Produced and Delivered for Sale in California in the 0-8,500 lbs GVWR plus MDPVs classes, if applicable) [Eq. 3]

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

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

- ⁷ *Calculating the CO composite emission value.* Composite emission values for CO shall be calculated in accordance with Equation 1 above. Unlike the NMOG+NOx composite emission standards, manufacturers may not comply with the CO composite emission standard through fleet averaging; each individual test group must comply with the standard. Test groups certified to 4,000-mile SFTP emission standards and federally-certified test groups certifying in California in accordance with Section H subparagraph 1.4 of "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" are not subject to this CO emission standard.

- (B) *SFTP PM Exhaust Emission Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.* The following standards are the maximum PM exhaust emissions through the full useful life from 2017 and subsequent model-year LEV III LEVs, ULEVs, and SULEVs in the PC, LDT, and MDPV classes when operating on the same gaseous or liquid fuel they use for FTP certification. In the case of fuel-flexible vehicles $\leq 6,000$ lbs. GVWR certified to LEV III FTP standards prior to model year 2017 and fuel-flexible vehicles $> 6,000$ lbs. GVWR certified to LEV III FTP standards prior to model year 2018, these standards only apply when the vehicles is operating on the LEV III certification gasoline specified in Part II, Section A.100.3.1.2 of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.” 2017 and subsequent model year multi-fueled vehicles (including bi- fueled, dual-fueled and fuel-flexible vehicles) $\leq 6,000$ lbs. GVWR and 2018 and subsequent model year multi-fueled vehicles $> 6,000$ lbs. GVWR, including vehicles certifying with carryover data, shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of fuel-flexible vehicles). Manufacturers must certify LEVs, ULEVs, and SULEVs in the PC, LDT, and MDPV classes, which are certifying to LEV III FTP PM emission standards in subsection (a)(2) on a 150,000-mile durability basis, to the *SFTP PM Exhaust Emission Standards* set forth in this subsection (a)(7)(B).

SFTP PM Exhaust Emission Standards for 2017 and Subsequent Model LEV III Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles¹					
<i>Vehicle Type</i>	<i>Test Weight</i>	<i>Mileage for Compliance</i>	<i>Test Cycle</i>	<i>PM² (mg/mi)</i>	
				<i>2018 and Prior Model Years</i>	<i>2019 and Subsequent Model Years</i>
All PCs and LDTs through 8,500 lbs GVWR; MDPVs	Loaded vehicle weight	150,000	US06	10	6

¹ All PCs, LDTs, and MDPVs certified to LEV III FTP PM emission standards in subsection (a)(2) on a 150,000- mile durability basis shall comply with the SFTP PM Exhaust Emission Standards in this table.

² *Relaxed Interim Certification Standard.* Manufacturers shall certify 2018 and prior model test groups to a relaxed interim US06 PM certification standard of 10 mg/mi. However, all 2019 and subsequent model vehicles certifying to the LEV III FTP PM standard, including those from carryover test groups, shall be subject to the 6 mg/mi US06 PM standard.

- (C) *SFTP NMOG+NOx and CO Exhaust Emission Standards for Medium-Duty Vehicles.* The following standards are the maximum NMOG+NOx and CO composite emission values for full useful life of 2016 and subsequent model-year medium-duty LEV III ULEVs and SULEVs from 8,501 through 14,000 pounds GVWR when operating on the same gaseous or liquid fuel they use for FTP certification. In the case of flex-fueled vehicles certified to LEV III FTP standards prior to model year 2018, SFTP compliance shall be demonstrated using the LEV III certification gasoline specified in Part II, Section A.100.3.1.2 of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.” 2018 and subsequent model year multi-fueled vehicles (including bi-fueled, dual-fueled and fuel-flexible vehicles), including vehicles certifying with carryover data, shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of fuel-flexible vehicles). The following composite emission standards do not apply to MDPVs subject to the emission standards presented in subsections (a)(7)(A) and (a)(7)(B).

SFTP NMOG+NOx and CO Composite Exhaust Emission Standards for 2016 and Subsequent Model ULEVs and SULEVs in the Medium-Duty Vehicle Class						
<i>Vehicle Type</i>	<i>Mileage for Compliance</i>	<i>HP/GVWR²</i>	<i>Test Cycle^{3,4,5}</i>	<i>Vehicle Emission Category⁶</i>	<i>Composite Emission Standard¹ (g/mi)</i>	
					<i>NMOG + NOx</i>	<i>Carbon Monoxide</i>
MDVs 8,501 - 10,000 lbs GVWR	150,000	≤ 0.024	US06 Bag 2, SC03, FTP	ULEV	0.550	22.0
				SULEV	0.350	12.0
		> 0.024	Full US06, SC03, FTP	ULEV	0.800	22.0
				SULEV	0.450	12.0
MDVs 10,001-14,000 lbs GVWR	150,000	n/a	Hot 1435 UC (Hot 1435 LA92), SC03, FTP	ULEV	0.550	6.0
				SULEV	0.350	4.0

- ¹ Manufacturers shall use Equation 1 in subsection (a)(7)(A)2 to calculate SFTP Composite Emission Values for each test group subject to the emission standards in this table. For MDVs 10,001-14,000 lbs. GVWR, the emission results from the UC test shall be used in place of results from the US06 test.
- ² *Power to Weight Ratio.* If all vehicles in a test group have a power to weight ratio at or below a threshold of 0.024, they may opt to run the US06 Bag 2 in lieu of the full US06 cycle. The cutoff is determined by using a ratio of the engine's maximum rated horsepower, as established by the engine manufacturer in the vehicle's Application for Certification, to the vehicle's GVWR in pounds and does not include any horsepower contributed by electric motors in the case of hybrid electric or plug-in hybrid electric vehicles. Manufacturers may opt to test to the full cycle regardless of the calculated ratio; in such case, manufacturers shall meet the emission standards applicable to vehicles with power-to-weight ratios greater than 0.024.
- ³ *Test Weight.* Medium-duty vehicles are tested at their adjusted loaded vehicle weight (average of curb weight and GVWR).
- ⁴ *Road Speed Fan.* Manufacturers have the option to use a road speed modulated fan as specified in 40-CFR § 86.107– 96(d)(1) or §1066.105, as applicable, instead of a fixed speed fan for MDV SFTP testing.
- ⁵ If a manufacturer provides an engineering evaluation for a test group showing that SC03 emissions are equivalent to or lower than FTP emissions, the FTP emission value may be used in place of the SC03 emission value when determining the composite emission value for that test group.
- ⁶ *Vehicle Emission Categories.* For MDVs 8,501-10,000 lbs. GVWR certified prior to the 2018 model year, for each model year, the percentage of MDVs certified to an SFTP emission category set forth in this section shall be equal to or greater than the total percentage certified to the FTP ULEV250, ULEV200, SULEV170, and SULEV150 emission categories; of these vehicles, the percentage of MDVs certified to an SFTP SULEV emission category shall be equal to or greater than the total percentage certified to both the FTP SULEV170 and SULEV150 emission categories. For MDVs 10,001-14,000 lbs. GVWR, for each model year, the percentage of MDVs certified to an SFTP emission category set forth in this section shall be equal to or greater than the total percentage certified to the FTP ULEV400, ULEV270, SULEV230, and SULEV200 emission categories; of these vehicles, the percentage of MDVs certified to an SFTP SULEV emission category shall be equal to or greater than the total percentage certified to both the FTP SULEV230 and SULEV200 emission categories. 2018 and subsequent model year MDVs 8,501-10,000 lbs. GVWR certifying to the FTP ULEV250 and ULEV200 emission categories, including vehicles certifying with carryover data, shall comply with the SFTP ULEV standards set forth in this subsection (a)(7)(C), and those certifying to FTP SULEV170 and SULEV150, including vehicles certifying with carryover data, shall comply with the SFTP SULEV standards set forth in this subsection (a)(7)(C). 2018 and subsequent model year MDVs 10,001-14,000 lbs. GVWR certifying to FTP ULEV400 and ULEV270 emission categories, including vehicles certifying with carryover data, shall comply with the SFTP ULEV standards set forth in this subsection (a)(7)(C), and those certifying to SULEV230 and SULEV200, including vehicles certifying with carryover data, shall comply with the SFTP SULEV standards set forth in this subsection (a)(7)(C).

- (D) **SFTP PM Exhaust Emission Standards for Medium-Duty Vehicles.** The following standards are the maximum PM composite emission values for the full useful life of 2017 and subsequent model-year LEV III LEVs, ULEVs, and SULEVs when operating on the same gaseous or liquid fuel they use for FTP certification. In the case of fuel-flexible vehicles certified to LEV III FTP standards prior to model year 2018, SFTP compliance shall be demonstrated using the LEV III certification gasoline specified in Part II, Section A.100.3.1.2 of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.” 2018 and subsequent model year multi-fueled vehicles (including bi-fueled, dual-fueled and fuel-flexible vehicles), including vehicles certifying with carryover data, shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of fuel-flexible vehicles). The following composite emission standards do not apply to MDPVs subject to the emission standards set forth in subsections (a)(7)(A) and (a)(7)(B).

SFTP PM Exhaust Emission Standards for 2017 and Subsequent Model Medium-Duty Vehicles¹					
<i>Vehicle Type</i>	<i>Test Weight</i>	<i>Mileage for Compliance</i>	<i>Hp/GVWR²</i>	<i>Test Cycle^{3,4,5}</i>	<i>PM (mg/mi)</i>
MDVs 8,501-10,000 lbs GVWR	Adjusted loaded vehicle weight	150,000	≤ 0.024	US06 Bag 2	7
			>0.024	US06	10
MDVs 10,001-14,000 lbs GVWR	Adjusted loaded vehicle weight	150,000	n/a	Hot 1435 UC (Hot 1435 LA92)	7

¹ Except for MDPVs subject to the emission standards set forth in subsection (a)(7)(B), MDVs certified to 150,000-mile FTP PM emission standards in subsection (a)(2) shall comply with the SFTP PM Exhaust Emission Standards in this table.

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

³ **Road Speed Fan.** Manufacturers have the option to use a road speed modulated fan as specified in 40-CFR § 86.107– 96(d)(1) or §1066.105, as applicable, instead of a fixed speed fan for MDV SFTP testing.

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

⁵ If a manufacturer provides an engineering evaluation for a test group demonstrating that SC03 PM emissions are equivalent to or lower than FTP PM emissions, the FTP PM emission value may be used in lieu of the SC03 PM emission value when determining the composite emission value for that test group.

(8) Interim In-Use Compliance Standards.

(A) *LEV III NMOG+NOx Interim In-Use Compliance Standards.* The following interim in-use compliance standards shall apply for the first two model years that a test group is certified to LEV III standards that are more stringent than the standards to which the test group was certified in a prior model year.

1. *NMOG+NOx Interim In-Use Compliance Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.* For the 2015 through 2019 model years, these standards shall apply.

<i>Emission Category</i>	<i>Durability Vehicle Basis (miles)</i>	<i>LEV III PCs, LDTs, and MDPVs</i>
		<i>NMOG + NOx (g/mi)</i>
LEV160	150,000	n/a
ULEV125	150,000	n/a
ULEV70	150,000	0.098
ULEV50	150,000	0.070
SULEV30	150,000	0.042 ¹
SULEV20	150,000	0.028 ¹

¹not applicable to test groups that receive PZEV credits

2. *NMOG+NOx Interim In-Use Compliance Standards for Medium-Duty Vehicles, Excluding Medium-Duty Passenger Vehicles.* For the 2015 through 2020 model years, these standards shall apply.

<i>Emission Category</i>	<i>Durability Vehicle Basis (miles)</i>	<i>LEV III MDVs (excluding MDPVs) 8,501 - 10,000 lbs. GVW</i>	<i>LEV III MDVs 10,001 - 14,000 lbs. GVW</i>
		<i>NMOG + NOx (g/mi)</i>	<i>NMOG + NOx (g/mi)</i>
LEV395	150,000	n/a	n/a
ULEV340	150,000	n/a	n/a
ULEV250	150,000	0.370	n/a
ULEV200	150,000	0.300	n/a
SULEV170	150,000	0.250	n/a
SULEV150	150,000	0.220	n/a
LEV630	150,000	n/a	n/a
ULEV570	150,000	n/a	n/a
ULEV400	150,000	n/a	0.600
ULEV270	150,000	n/a	0.400
SULEV230	150,000	n/a	0.340
SULEV200	150,000	n/a	0.300

(B) *LEV III Particulate Interim In-Use Compliance Standards.* The following interim in-use compliance standards shall apply for the first two model years that a test group is certified to the LEV III standards.

1. *LEV III Particulate Interim In-Use Compliance Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.* For the 2017 through 2020 model years, the interim in-use compliance standard for vehicles certifying to the 3 mg/mi particulate standard is 6 mg/mi. For the 2025 through 2028 model years, the interim in-use compliance standard for vehicles certifying to the 1 mg/mi particulate standard is 2 mg/mi.

2. *LEV III Particulate Interim In-Use Compliance Standards for Medium- Duty Vehicles, excluding Medium-Duty Passenger Vehicles.* For the 2017 through 2020 model years, the interim in-use compliance standard for vehicles certifying to the 8 mg/mi particulate standard shall be 16 mg/mi and the interim in-use compliance standard for vehicles certifying to the 10 mg/mi particulate standard shall be 20 mg/mi.

(C) SFTP Interim In-Use Compliance Standards.

1. 2016 and prior model year light-duty and medium-duty passenger vehicle test groups that contain vehicles at or below 6,000 lbs. GVWR, 2017 and prior model year light-duty and medium-duty passenger vehicle test groups with only vehicles above 6,000 lbs. GVWR, and 2019 and prior model year medium-duty vehicle test groups may use an in-use compliance standard for NMOG+NO_x for the first two model years that they are certified to LEV III NMOG+NO_x standards or a LEV III SFTP NMOG+NO_x bin.
 - a. For light-duty vehicle test groups and medium-duty passenger vehicle test groups certifying to the standards in subsection (a)(7)(A)1, in-use compliance emission standards for NMOG+NO_x shall be 1.4 times the applicable certification standard.
 - b. For light-duty vehicle test groups and medium-duty passenger vehicle test groups certifying to the standards in subsection (a)(7)(A)2, in-use compliance emission standards for NMOG+NO_x shall be 1.4 times the Composite Value of the bin to which a test group is certified.
 - c. For medium-duty vehicle tests groups certifying to the standards in subsection (a)(7)(C), in-use compliance emission standards for NMOG+NO_x shall be 1.4 times the applicable certification standard.

2. 2023 and prior model year light-duty and medium-duty passenger vehicle test groups that certify to a LEV III SFTP PM exhaust emission standard in subsection (a)(7)(B) may use an in-use compliance standard for SFTP PM regardless of the model year that the test groups first certified to the LEV III SFTP PM standard. 2022 and prior model year medium-duty vehicle test groups may use an in-use compliance standard for PM for the first two model years that they are certified to a LEV III SFTP PM exhaust emission standard in subsection (a)(7)(D).
 - a. For light-duty vehicle test groups and medium-duty passenger vehicle test groups certifying to SFTP PM exhaust emission standards in subsection (a)(7)(B), in-use compliance emission standards for PM shall be 10 mg/mi.
 - b. For medium-duty vehicle test groups certifying to SFTP PM Exhaust Emission Standards in subsection (a)(7)(D), in-use compliance emission standards for PM shall be 5.0 mg/mi higher than the applicable certification standard.
- (9) *Requirement to Generate Additional NMOG+NOx Fleet Average Credit.* For a vehicle that is certified to the LEV III standards in subsection (a)(1), which does not generate a partial ZEV allocation according to the criteria set forth in section C.3 of the “California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes” and the “California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” a manufacturer may subtract 5 mg/mi from the NMOG+NOx emission standards value set forth in subsection (b)(1)(B)1.c when calculating the manufacturer’s fleet average, provided that the manufacturer extends the performance and defects warranty period to 15 years or 150,000 miles, whichever occurs first, except that the time period is to be 10 years for a zero emission energy storage device (such as battery, ultracapacitor, or other electric storage device).

- (10) *Requirement to Generate a Partial ZEV Allowance.* For the 2015 through 2017 model years, a manufacturer that certifies to the LEV III SULEV30 or the LEV III SULEV20 standards may also generate a partial ZEV allocation according to the criteria set forth in section C.3 of the “California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes.”
- (11) *NMOG Credit for Direct Ozone Reduction Technology.* A manufacturer that certifies vehicles equipped with direct ozone reduction technologies shall be eligible to receive NMOG credits that can be applied to the NMOG exhaust emissions of the vehicle when determining compliance with the standard. In order to receive credit, the manufacturer must submit the following information for each vehicle model for which it gets credit, including, but not limited to:
 - (A) a demonstration of the airflow rate through the direct ozone reduction device and the ozone-reducing efficiency of the device over the range of speeds encountered in the Unified Cycle Driving Schedule contained in Part II G. of the “California 2015 and Subsequent Model Criteria Pollutant Emission Standards and Test Procedures for and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty trucks and Medium-duty Vehicles”;
 - (B) an evaluation of the durability of the device for the full useful life of the vehicle; and
 - (C) a description of the on-board diagnostic strategy for monitoring the performance of the device in-use. Using the above information, the Executive Officer shall determine the value of the NMOG credit based on the calculated change in the one-hour peak ozone level using an approved airshed model. This credit can only be used for determining compliance with the exhaust standards in subsection (a)(1) or subsection 1961(a)(1), as applicable.
- (12) When a Federally-Certified Vehicle Model is Required in California.

- (A) *General Requirement.* Whenever a manufacturer federally-certifies a 2015 or subsequent model-year passenger car, light-duty truck, or medium-duty vehicle model to the standards for a particular emissions bin that are more stringent than the standards for an applicable California emission category, the equivalent California model may only be certified to (i) the California standards for a vehicle emissions category that are at least as stringent as the standards for the corresponding federal emissions bin, or (ii) the exhaust emission standards to which the federal model is certified. However, where the federal exhaust emission standards for the particular emissions bin and the California standards for a vehicle emissions category are equally stringent, the California model may only be certified to either the California standards for that vehicle emissions category or more stringent California standards. The federal emission bins are those contained in Tables S04-1 and S04-2 of 40 CFR §86.1811-04(c), as adopted February 10, 2000, and in Table 2 of 40 CFR §86.1811.17(b), as adopted April 28, 2014. The criteria for applying this requirement are set forth in Part I. Section H.1 of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.”
- (B) *Exception for clean fuel fleet vehicles.* Subsection (a)(12)(A) does not apply in the case of a federally-certified vehicle model that is only marketed to fleet operators for applications that are subject to clean fuel fleet requirements established pursuant to section 246 of the federal Clean Air Act (42 U.S.C. sec. 7586). In addition, the Executive Officer shall exclude from the requirement a federally-certified vehicle model where the manufacturer demonstrates to the Executive Officer’s reasonable satisfaction that the model will primarily be sold or leased to clean fuel fleet operators for such applications, and that other sales or leases of the model will be incidental to marketing to those clean fuel fleet operators.

- (13) *Emission Standard for a Fuel-Fired Heater.* Whenever a manufacturer elects to utilize an on-board fuel-fired heater on any passenger car, light-duty truck or medium-duty vehicle, the fuel-fired heater must meet ULEV125 standards for passenger cars and light-duty trucks less than 8,500 pounds GVWR as set forth in subsection (a)(1). The exhaust emissions from the fuel-fired heater shall be determined in accordance with the “California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes” or the “California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” as applicable. If the on-board fuel-fired heater is capable of operating at ambient temperatures above 40°F, the measured emission levels of the on-board fuel-fired heater shall be added to the emissions measured on the FTP (40 CFR, Part 86, Subpart B), as amended by the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light- Duty Trucks, and Medium-Duty Vehicles” to determine compliance with the exhaust emission standards in subsection (a)(1).
- (b) Emission Standards Phase-In Requirements for Manufacturers.
- (1) *Fleet Average NMOG + NO_x Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.*
- (A) The fleet average non-methane organic gas plus oxides of nitrogen exhaust mass emission values from the passenger cars, light-duty trucks, and medium-duty passenger vehicles that are produced and delivered for sale in California each model year by a manufacturer other than a small volume manufacturer shall not exceed:

FLEET AVERAGE NON-METHANE ORGANIC GAS PLUS OXIDES OF NITROGEN EXHAUST MASS EMISSION REQUIREMENTS FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM- DUTY PASSENGER VEHICLES (150,000 mile Durability Vehicle Basis)		
Model Year	Fleet Average NMOG + NO _x (grams per mile)	
	All PCs; LDTs 0-3750 lbs. LVW	LDTs 3751 lbs. LVW - 8500 lbs. GVWR; All MDPVs

2014 ¹	0.107	0.128
2015	0.100	0.119
2016	0.093	0.110
2017	0.086	0.101
2018	0.079	0.092
2019	0.072	0.083
2020	0.065	0.074
2021	0.058	0.065
2022	0.051	0.056
2023	0.044	0.047
2024	0.037	0.038
2025+	0.030	0.030

¹ For the 2014 model year, a manufacturer may comply with the fleet average NMOG+NOx values in this table in lieu of complying with the NMOG fleet average values in subsection 1961(a)(b)(1)(A). A manufacturer must either comply with the NMOG+NOx fleet average requirements for both its PC/LDT1 fleet and its LDT2/MDPV fleet or comply with the NMOG fleet average requirements for both its PC/LDT1 fleet and its LDT2 fleet. A manufacturer must calculate its fleet average NMOG+NOx values using the applicable full useful life standards.

1. A manufacturer that selects compliance Option 2 must provide to the Executive Officer separate values for the number of vehicles in each test group produced and delivered for sale in the District of Columbia and for each individual state within the average.
2. *PZEV Anti-Backsliding Requirement.* In the 2018 and subsequent model years, a manufacturer must produce and deliver for sale in California a minimum percentage of its passenger car and light-duty truck fleet that certifies to SULEV30 and SULEV20 standards. This minimum percentage must be equal to the average percentage of PZEVs produced and delivered for sale in California for that manufacturer for the 2015 through 2017 model year. A manufacturer may calculate this average percentage using the projected sales for these model years in lieu of actual sales. The percentage of a manufacturer's passenger car and light-duty truck fleet that certifies to SULEV30 and SULEV20 standards averaged across the applicable model year and the two previous model years shall be used to determine compliance with this requirement, beginning with the 2020 model year.

(B) Calculation of Fleet Average NMOG + NO_x Value.

1. Basic Calculation.

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

$$\frac{\begin{aligned} & \square \square [\text{Number of vehicles in a test group excluding off-vehicle charge capable} \\ & \quad \text{hybrid electric vehicles} \times \text{applicable emission standard}] + \\ & \square [\text{Number of off-vehicle charge capable hybrid electric vehicles in a test} \\ & \quad \text{group} \times \text{HEV NMOG+NO}_x \text{ contribution factor}] \end{aligned}}{\text{Total Number of PCs plus LDT1s Produced and Delivered for sale in California, Including ZEVs and HEVs}}$$

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

$$\frac{\begin{aligned} & (\square [\text{Number of vehicles in a test group excluding off-vehicle charge capable hybrid} \\ & \quad \text{electric vehicles} \times \text{applicable emission standard}] + \\ & \square [\text{Number of off-vehicle charge capable hybrid electric vehicles in a test group} \times \text{HEV} \\ & \quad \text{NMOG factor}]) \square \end{aligned}}{\text{Total Number of LDT2s plus MDPVs Produced and Delivered for sale in California, Including ZEVs and HEVs}}$$

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

Model Year	Emission Category	Emission Standard Value ¹ (g/mi)	
		All PCs; LDTs 0-3750 lbs. LVW	LDTs 3751-5750 lbs. LVW; All MDPVs
2015 and subsequent model year federally-certified vehicles	All	Sum of the full useful life NMOG and NOx Federal Emission Standards to which Vehicle is Certified	Sum of the full useful life NMOG and NOx Federal Emission Standards to which Vehicle is Certified
Model Year	Emission Category	All PCs; LDTs 0-3750 lbs. LVW	LDTs 3751 lbs. LVW - 8500 lbs. GVWR;
2015 through 2019 model year vehicles certified to the "LEV II" standards in subsection 1961(a)(1);	LEV II LEVs; LEV160s	0.160	0.160
	LEV II ULEVs; LEV125s	0.125	0.125
	ULEV70s	0.070	0.070
2015 and subsequent model year vehicles certified to the "LEV III" standards in subsection 1961.2(a)(1)	ULEV50s	0.050	0.050
	LEV II SULEVs; SULEV30s	0.030	0.030
	SULEV20s	0.020	0.020
	LEV II LEVs; LEV395s	n/a	0.395
	LEV II ULEVs	n/a	0.343
	ULEV340s	n/a	0.340
	ULEV250s	n/a	0.250
	ULEV200s	n/a	0.200
	SULEV170s	n/a	0.170
	SULEV150s	n/a	0.150

¹ For LEV III vehicle test groups that meet the extended emission warranty requirements in subsection (a)(9), the applicable emission standard value shall be the emission standard value set forth in this table minus 5 mg/mi.

2. **NMOG+NOx Contribution Factor for Off-vehicle Charge Capable HEVs.** The HEV NMOG+NOx contribution factor for light-duty off-vehicle charge capable hybrid electric vehicles is calculated as follows. For the purpose of applying this formula to light-duty off-vehicle charge capable hybrid electric vehicles that are certified to the LEV II standards set forth in subsection 1961(a)(1), a LEV II LEV shall use the formula for LEV160, a LEV II ULEV shall use the formula for ULEV125, and a LEV II SULEV shall use the formula for SULEV30.

LEV160 HEV Contribution Factor = $0.160 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.035]$

ULEV125 HEV Contribution Factor = $0.125 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.055]$

ULEV70 HEV Contribution Factor = $0.070 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.020]$

ULEV50 HEV Contribution Factor = $0.050 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.020]$

SULEV30 HEV Contribution Factor = $0.030 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.010]$

SULEV20 HEV Contribution Factor = $0.020 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.020]$

Where the Zero-emission VMT Allowance for 2015 through 2017 model year off-vehicle charge capable HEVs is determined in accordance with section C.3 of the "California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero- Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes." For the 2018 and subsequent model years, the Zero- emission VMT Allowance is equal to the sum of the Zero-Emission Vehicles Miles Traveled TZEV Allowance and the Allowance for US06 Capability in section C.3.3 of the "California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero- Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," as applicable. For the purposes of this subsection (b)(1)(B)2, the maximum allowable Zero-emission VMT Allowance that may be used in these equations is 1.0.

(C) Phase-In Requirements for Small Volume Manufacturers.

1. In the 2015 through 2016 model years, a small volume manufacturer shall not exceed a fleet average NMOG+NOx value of 0.160 g/mi for PCs and LDTs from 0-3750 lbs. LVW or 0.160 g/mi for LDTs from 3751-5750 lbs. LVW calculated in accordance with subsection (b)(1)(B). In the 2017 through 2021 model years, a small volume manufacturer shall not exceed a fleet average NMOG+NOx value of 0.125 g/mi for PCs and LDTs from 0-3750 lbs. LVW or 0.125 g/mi for LDTs from 3751 lbs. LVW - 8,500 lbs. GVW and MDPVs calculated in accordance with subsection (b)(1)(B). In 2022 and subsequent model years, a small volume manufacturer shall not exceed a fleet average NMOG+NOx value of 0.051 g/mi for PCs and LDTs from 0-3750 lbs. LVW or 0.051 g/mi for LDTs from 3751 lbs. LVW - 8,500 lbs. GVW and MDPVs calculated in accordance with subsection (b)(1)(B). For the 2015 through 2021 model years, a small volume manufacturer may certify its vehicles to the LEV II exhaust standards in section 1961. All vehicles certified by a small volume manufacturer for the 2022 and subsequent model years must meet the LEV III exhaust standards in this section.

2. If a manufacturer's average California sales exceeds 4500 units of new PCs, LDTs, MDVs, heavy-duty vehicles, and heavy-duty engines based on the average number of vehicles sold for the three previous consecutive model years, the manufacturer shall no longer be treated as a small volume manufacturer. If this is the first time the manufacturer exceeds the 4500 unit sales limit, the manufacturer must comply with the fleet average requirements applicable to a large volume manufacturer, as specified in subsection (b)(1)(A) beginning with the fourth model year after the last of the three consecutive model years. If during this four year lead time period the manufacturer's sales drop below the 4500 unit sales limit and then increase again above the 4500 unit sales limit, the four year lead time period shall be calculated based on the first model year in which the manufacturer again exceeds the 4500 unit sales limit. Except as noted above – i.e., if this is not the first time the manufacturer has exceeded the 4500 unit sales limit – the manufacturer shall comply with the fleet average requirements applicable to larger manufacturers as specified in subsection (b)(1)(A) beginning with the following model year after the last of the three consecutive model years.
 3. If a manufacturer's average California sales fall below 4500 units of new PCs, LDTs, MDVs and heavy duty engines based on the average number of vehicles sold for the three previous consecutive model years, the manufacturer shall be treated as a small volume manufacturer and shall be subject to the requirements for small volume manufacturers beginning with the next model year.
- (D) *Treatment of ZEVs.* ZEVs classified as LDTs (>3750 lbs. LVW) that have been counted toward the ZEV requirement for PCs and LDTs (0-3750 lbs. LVW) as specified in sections 1962.1 and 1962.2 shall be included as LDT1s in the calculation of a fleet average NMOG+NOx value.
- (2) *LEV III Phase-In Requirement for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles*

For the 2015 and 2016 model years, the LEV II SULEV emission standards set forth in section 1961(a)(1) that are applicable to PCs, LDTs, and MDPVs shall only apply to those PCs, LDT1s, LDT2s, and MDPVs that certify to SULEV emission standards using “carryover” of emission test data from a previous model year in accordance with U.S. EPA OMS Advisory Circular A/C No. 17F, issued November 16, 1982, and last amended January 21, 1988, incorporated herein by reference. Beginning in the 2017 model year, the LEV II SULEV emission standards set forth in section 1961(a)(1) that are applicable to PCs, LDTs, and MDPVs shall only apply to those PCs, LDT1s, LDT2s, and MDPVs that receive partial ZEV allowances in accordance with the “California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes.” A manufacturer, other than a small volume manufacturer, must certify 100 percent of its PC, LDT, and MDPV fleet to the LEV III standards in subsection (a)(1) in 2020 and subsequent model years. A small volume manufacturer must certify 100 percent of its PC, LDT, and MDPV fleet to the LEV III standards in subsection (a)(1) in 2022 and subsequent model years.

(3) *LEV III Phase-In Requirements for Medium-Duty Vehicles, Other than Medium-Duty Passenger Vehicles.*

(A) *Requirement for Manufacturers Other than Small Volume Manufacturers.* A manufacturer of MDVs, other than a small volume manufacturer, shall certify its MDV fleet according to the following phase-in schedule:

1. LEV III Phase-in Requirements for Medium-Duty Vehicles Certified to Subsection (a)(1).

Model Year	Vehicles Certified to §1961.2.1(a)(1) ¹ (%)			
	LEV II LEV; LEV III LEV395 or LEV630	LEV II ULEV; LEV III ULEV340 or ULEV570	LEV III ULEV250 or ULEV400	LEV III SULEV170 or SULEV230
2015	40	60	0	0
2016	20	60	20	0
2017	10	50	40	0
2018	0	40	50	10
2019	0	30	40	30
2020	0	20	30	50
2021	0	10	20	70
2022 +	0	0	10	90

¹ The LEV II LEV and LEV II ULEV emission categories are only applicable for the 2015 through 2019 model years. The LEV III LEV395, LEV630, ULEV340, and ULEV570 emission categories are only applicable for the 2015 through 2021 model years.

2. LEV III Phase-in Requirements for Incomplete Medium-Duty Vehicles Using Otto-Cycle Engines Certified to Title 13, CCR, Section 1956.8, and Medium-Duty Vehicles Using Diesel Engines Certified to Title 13, CCR, Section 1956.8.

Model Year	Vehicle Using Engines Certified to title 13, CCR, Subsection 1956.8(c)(1)(B) or (h)(2) (%)	Vehicles Using Engines Certified to title 13, CCR, Subsection 1956.8(c)(1)(C) or (h)(7) (%)
2015-2023	100% ULEV	0

2024+	0	100%

(B) *Requirements for Small Volume Manufacturers.* In the 2015 through 2017 model years, a small volume manufacturer shall certify, produce, and deliver for sale in California vehicles or engines certified to the MDV LEV II LEV standards or to the LEV III LEV395 or LEV III LEV630 standards, as applicable, in a quantity equivalent to 100% of its MDV fleet. In the 2018 through 2021 model years, a small volume manufacturer shall certify, produce, and deliver for sale in California vehicles or engines certified to the MDV LEV II ULEV standards or to the LEV III ULEV340 or LEV III ULEV570 standards, as applicable, in a quantity equivalent to 100% of its MDV fleet. In the 2022 and subsequent model years, a small volume manufacturer shall certify, produce, and deliver for sale in California vehicles or engines certified to the MDV LEV III ULEV250 or LEV III ULEV400 standards, as applicable, in a quantity equivalent to 100% of its MDV fleet. Engines certified to these MDV standards are not eligible for emissions averaging.

(C) Alternate Phase-In Schedules for LEV III MDVs.

1. Alternate Phase-In Schedules for LEV III MDVs for All Manufacturers.

- a. For the 2016 and subsequent model years, the fleet average non methane organic gas plus oxides of nitrogen exhaust mass emission values from the medium-duty vehicles produced and delivered for sale in California each model year shall not exceed:

FLEET AVERAGE NON-METHANE ORGANIC GAS PLUS OXIDES OF NITROGEN EXHAUST MASS EMISSION REQUIREMENTS FOR MEDIUM-DUTY VEHICLES (150,000 mile Durability Vehicle Basis)		
Model Year	Fleet Average NMOG + NOx (g/mi)	
	MDVs 8,501 - 10,000 lbs. GVWR	MDVs 10,001-14,000 lbs. GVWR
2016	0.333	0.548
2017	0.310	0.508
2018	0.278	0.451
2019	0.253	0.400
2020	0.228	0.349
2021	0.203	0.298
2022+	0.178	0.247

- b. Each manufacturer's fleet average NMOG+NOx value for the total number of MDVs 8,501 - 10,000 lbs. GVWR produced and delivered for sale in California shall be calculated as follows:

- ($\square$ [Number of MDVs 8,501 - 10,000 lbs. GVWR in a test group excluding off-vehicle charge capable hybrid electric vehicles x applicable emission standard] +
 $\square$ [Number of off-vehicle charge capable hybrid electric vehicles in a test group x
 HEV NMOG+NOx contribution factor]) $\div$

Total Number of MDVs 8,501 - 10,000 lbs. GVWR Produced and Delivered
 for sale in California, Including ZEVs and HEVs

- c. Each manufacturer's fleet average NMOG+NOx value for the total number of MDVs 10,001-14,000 lbs. GVWR produced and delivered for sale in California shall be calculated as follows:

- $\square$ $\square$ [Number of MDVs 10,001 - 14,000 lbs. GVWR in a test group excluding off-vehicle charge capable hybrid electric vehicles x applicable emission standard] +
 $\square$ [Number of off-vehicle charge capable hybrid electric vehicles in a test group x
 HEV NMOG+NOx contribution factor]) $\div$

Total Number of MDVs 10,001 - 14,000 lbs. GVWR Produced and Delivered
 for sale in California, Including ZEVs and HEVs

- d. The applicable emission standards to be used in the above equations are as follows:

Model Year	Emission Category	Emission Standard Value (g/mi)
2016 and subsequent model year federally- certified vehicles	All	Sum of the full useful life NMOG and NOx Federal Emission Standards or full useful life NMOG+NOx Federal Emission Standard to which Vehicle is Certified
2016 through 2019 model year vehicles certified to the "LEV II" standards in subsection 1961(a)(1)	All	Sum of the full useful life NMOG and NOx LEV II Emission Standards to which Vehicle is Certified
2016 and subsequent model year vehicles certified to the "LEV III" standards in subsection (a)(1)	All	Full useful life NMOG+NOx LEV III Emission Standards to which Vehicle is Certified

- e. *NMOG+NOx Contribution Factor for Off-vehicle Charge Capable HEVs.* The HEV NMOG+NOx contribution factors for medium-duty off-vehicle charge capable hybrid electric vehicles are calculated as follows.

The Zero-emission VMT Allowance for 2016 and 2017 model year off-vehicle charge capable HEVs is determined in accordance with section C.3 of the “California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes.” For the 2018 and subsequent model years, the Zero-emission VMT Allowance is equal to the sum of the Zero-Emission Vehicles Miles Traveled TZEV Allowance and the Allowance for US06 Capability in section C.3.3 of the “California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” as applicable. For the purposes of this subsection (b)(3)(C)1.e, the maximum allowable Zero-emission VMT Allowance that may be used in these equations is 1.0.

- i. *NMOG+NO_x Contribution Factor for Off-vehicle Charge Capable HEVs 8,501 - 10,000 lbs. GVWR.* The HEV NMOG+NO_x contribution factors for medium-duty off-vehicle charge capable hybrid electric vehicles 8,501 - 10,000 lbs. GVWR are calculated as follows.

For the purpose of applying this formula to medium-duty off-vehicle charge capable hybrid electric vehicles 8,501 - 10,000 lbs. GVWR that are certified to the LEV II standards set forth in subsection 1961(a)(1), a LEV II LEV shall use the formula for LEV395, a LEV II ULEV shall use the formula for ULEV340, and a LEV II SULEV shall use the formula for ULEV200.

$$\text{LEV395 HEV Contribution Factor} = 0.395 - [(\text{Zero-emission VMT Allowance}) \times 0.055]$$

$$\text{ULEV340 HEV Contribution Factor} = 0.340 - [(\text{Zero-emission VMT Allowance}) \times 0.090]$$

$$\text{ULEV250 HEV Contribution Factor} = 0.250 - [(\text{Zero-emission VMT Allowance}) \times 0.050]$$

$$\text{ULEV200 HEV Contribution Factor} = 0.200 - [(\text{Zero-emission VMT Allowance}) \times 0.030]$$

$$\text{SULEV170 HEV Contribution Factor} = 0.170 - [(\text{Zero-emission VMT Allowance}) \times 0.020]$$

$$\text{SULEV150 HEV Contribution Factor} = 0.150 - [(\text{Zero-emission VMT Allowance}) \times 0.020]$$

- ii. *NMOG+NO_x Contribution Factor for Off-vehicle Charge Capable HEVs 10,001 - 14,000 lbs. GVWR.* The HEV NMOG+NO_x contribution factors for medium-duty off-vehicle charge capable hybrid electric vehicles 10,001 - 14,000 lbs. GVWR are calculated as follows.

For the purpose of applying this formula to medium-duty off-vehicle charge capable hybrid electric vehicles 10,001 - 14,000 lbs. GVWR that are certified to the LEV II standards set forth in subsection 1961(a)(1), a LEV II LEV shall use the formula for LEV630, a LEV II ULEV shall use the formula for ULEV570, and a LEV II SULEV shall use the formula as follows.

LEV II SULEV HEV Contribution Factor = $0.327 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.057]$

LEV630 HEV Contribution Factor = $0.630 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.060]$

ULEV570 HEV Contribution Factor = $0.570 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.170]$

ULEV400 HEV Contribution Factor = $0.400 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.130]$

ULEV270 HEV Contribution Factor = $0.270 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.040]$

SULEV230 HEV Contribution Factor = $0.230 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.030]$

SULEV200 HEV Contribution Factor = $0.200 - [(Zero\text{-}emission\ VMT\ Allowance) \times 0.030]$

2. Alternate Phase-In Schedules for LEV III MDVs Certified to Subsection (a)(1) for Manufacturers with a Limited Number of Test Groups. For the 2016 and subsequent model years, a manufacturer that produces and delivers for sale in California four or fewer medium-duty test groups may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles.
 - a. A manufacturer that produces and delivers for sale in California four medium-duty test groups certified to subsection (a)(1) may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles instead of subsection (b)(3)(A)1.

<i>Model Year</i>	<i>Number of Test Groups Certified to §1961.2.1(a)(1)</i>			
	LEV II LEV; LEV III LEV395 or LEV630	LEV II ULEV; LEV III ULEV340 or ULEV570	LEV III ULEV250 or ULEV400	LEV III SULEV17 0 or SULEV23 0
2016-2017	1	2	1	0
2018	0	2	2	0
2019	0	1	2	1
2020	0	1	1	2
2021	0	0	1	3
2022 +	0	0	0	4

- b. A manufacturer that produces and delivers for sale in California three medium-duty test groups certified to subsection (a)(1) may comply with the following alternate phase-in schedule for LEV III medium-duty vehicles instead of subsection (b)(3)(A)1.

<i>Model Year</i>	<i>Number of Test Groups Certified to §1961.2.1(a)(1)</i>			
	LEV II LEV; LEV III LEV395 or LEV630	LEV II ULEV; LEV III ULEV340 or ULEV570	LEV III ULEV250 or ULEV400	LEV III SULEV17 0 or SULEV23 0
2016	1	2	0	0
2017	0	2	1	0
2018	0	1	2	0
2019-2020	0	1	1	1
2021	0	0	1	2

2022 +	0	0	0	3

- c. A manufacturer that produces and delivers for sale in California two medium- duty test groups certified to subsection (a)(1) may comply with the following alternate phase- in schedule for LEV III medium-duty vehicles instead of subsection (b)(3)(A)1.

Model Year	Number of Test Groups Certified to §1961.2(a)(1)			
	LEV II LEV; LEV III LEV395 or LEV630	LEV II ULEV; LEV III ULEV340 or ULEV570	LEV III ULEV250 or ULEV400	LEV III SULEV17 0 or SULEV23 0
2016	1	1	0	0
2017-2019	0	1	1	0
2020-2021	0	0	1	1
2022 +	0	0	0	2

- d. A manufacturer that produces and delivers for sale in California one medium- duty test groups certified to subsection (a)(1) may comply with the following alternate phase- in schedule for LEV III medium-duty vehicles instead of subsection (b)(3)(A)1.

Model Year	Number of Test Groups Certified to §1961.2.1(a)(1)			
	LEV II LEV; LEV III LEV395 or LEV630	LEV II ULEV; LEV III ULEV340 or ULEV570	LEV III ULEV250 or ULEV400	LEV III SULEV17 0 or SULEV23 0
2016-2018	0	1	0	0
2019-2021	0	0	1	0

2022 +	0	0	0	1

- (D) *Identifying a Manufacturer's MDV Fleet.* Each manufacturer's MDV fleet shall be defined as the total number of California-certified MDVs produced and delivered for sale in California. For the purpose of demonstrating compliance with the LEV III phase-in requirements in subsection (b)(3), each manufacturer's MDV fleet must be divided into two separate groups of vehicles: "chassis-certified MDVs" that certify to subsection (a)(1) and "engine-certified MDVs" that use engines certified to the standards in section 1956.8. The phase-in percentages in subsection (b)(3) for vehicles certified to subsection (a)(1) shall be applied to the manufacturers' total production of California chassis-certified medium-duty vehicles delivered for sale in California. The phase-in percentages in subsection (b)(3) for vehicles certified to section 1956.8 shall be applied to the manufacturer's total production of California engine-certified medium-duty vehicles delivered for sale in California.
- (E) For a manufacturer that elects to certify to the optional medium-duty engine standards in title 13, CCR subsections 1956.8(c) or (h), all such MDVs, including those produced by a small volume manufacturer, shall be subject to the emissions averaging provisions applicable to heavy-duty diesel or Otto-cycle engines as set forth in the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines," or the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines, incorporated by reference in subsections 1956.8(b) or (d), as applicable.
- (4) SFTP Phase-In Requirements.
- (A) *Phase-In Requirement for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.* A test group certifying to LEV III FTP emission categories on a 150,000-mile durability basis shall also certify to SFTP requirements on a 150,000-mile durability basis.

Manufacturers shall have two options for phase in to the SFTP NMOG+NOx and CO emission standards.

1. Under Option 1, beginning with the 2015 model year, a manufacturer shall certify its PCs, LDTs, and MDPVs to the SFTP NMOG+NOx and CO emission standards in subsection (a)(7)(A)1 when the vehicles are also certifying to a LEV III FTP emission category at 150,000-mile durability.
2. Under Option 2, for 2015 and subsequent model years, a manufacturer shall certify its fleet of PCs, LDTs, and MDPVs such that the manufacturer's sales-weighted fleet- average NMOG+NOx composite emission value and each test group's CO composite emission value does not exceed the applicable composite emission standards in effect for that model year in accordance with subsection (a)(7)(A)2.

Beginning with the 2017 model year, a manufacturer shall certify its PCs, LDTs, and MDPVs certifying to LEV III FTP PM emission standards on a 150,000-mile durability basis to the SFTP PM emission standards in subsection (a)(7)(B).

- (B) *Phase-In Requirements for Medium-Duty Vehicle Manufacturers.* Phase-in for NMOG+NO_x and CO emission standards begins with the 2016 model year. For MDVs 8,501-10,000 lbs. GVWR certified prior to the 2018 model year, for each model year, the percentage of MDVs certified to an SFTP emission category set forth in this section shall be equal to or greater than the total percentage certified to the FTP ULEV250, ULEV200, SULEV170, and SULEV150 emission categories; of these vehicles, the percentage of MDVs certified to an SFTP SULEV emission category shall be equal to or greater than the total percentage certified to both the FTP SULEV170 and SULEV150 emission categories. For MDVs 10,001-14,000 lbs. GVWR, for each model year, the percentage of MDVs certified to an SFTP emission category set forth in this section shall be equal to or greater than the total percentage certified to the FTP ULEV400, ULEV270, SULEV230, and SULEV200 emission categories; of these vehicles, the percentage of MDVs certified to an SFTP SULEV emission category shall be equal to or greater than the total percentage certified to both the FTP SULEV230 and SULEV200 emission categories. 2018 and subsequent model year MDVs 8,501-10,000 lbs. GVWR certifying to the FTP ULEV250 and ULEV200 emission categories, including vehicles certifying with carryover data, shall comply with the SFTP ULEV standards set forth in subsection (a)(7)(C), and those certifying to FTP SULEV170 and SULEV150, including vehicles certifying with carryover data, shall comply with the SFTP SULEV standards set forth in subsection (a)(7)(C). 2018 and subsequent model year MDVs 10,001-14,000 lbs. GVWR certifying to FTP ULEV400 and ULEV270 emission categories, including vehicles certifying with carryover data, shall comply with the SFTP ULEV standards set forth in subsection (a)(7)(C), and those certifying to SULEV230 and SULEV200, including vehicles certifying with carryover data, shall comply with the SFTP SULEV standards set forth in subsection (a)(7)(C).

In addition, 2017 and subsequent model MDVs certifying to LEV III FTP PM emission standards on a 150,000-mile durability basis must also certify to the SFTP emission standards set forth in subsection (a)(7)(D).

(C) *Identifying a Manufacturer's Medium-Duty Vehicle Fleet.* For the 2016 and subsequent model years, each manufacturer's MDV fleet shall be defined as the total number of California-certified MDVs, other than MDPVs, produced and delivered for sale in California. For 2016 and subsequent model years, a manufacturer that elects to certify engines to the optional medium-duty engine emission standards in section 1956.8 shall not count those engines in the manufacturer's total production of California-certified medium-duty vehicles for purposes of this subparagraph.

(c) Calculation of NMOG + NOx Credits/Debits

(1) Calculation of NMOG+NOx Credits and Debits for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.

(A) In 2015 and subsequent model years, a manufacturer shall calculate its credits or debits using the following equation.

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

(B) In 2015 and subsequent model years, a manufacturer that achieves fleet average NMOG+NOx values lower than the fleet average NMOG+NOx requirement for the corresponding model year shall receive credits in units of g/mi NMOG + NOx . A manufacturer with 2015 and subsequent model year fleet average NMOG+NOx values greater than the fleet average requirement for the corresponding model year shall receive debits in units of g/mi NMOG + NOx equal to the amount of negative credits determined by the aforementioned equation. The total g/mi NMOG+NOx credits or debits earned for PCs and LDTs 0-3750 lbs. LVW, and for LDTs 3751 lbs. LVW - 8500 lbs. GVWR and for MDPVs shall be summed together. The resulting amount shall constitute the g/mi NMOG+NOx credits or debits accrued by the manufacturer for the model year.

(2) Calculation of NMOG+NOx Credits and Debits for Medium-Duty Vehicles Other than MDPVs.

A manufacturer that elects to comply with the phase-in requirements for LEV III medium-duty vehicles other than MDPVs in subsection (b)(3)(A) or subsection (b)(3)(B) shall calculate vehicle-equivalent NMOG+NO_x credits in accordance with subsection (c)(2)(A). A manufacturer that elects to comply with the alternative phase-in schedule for LEV III medium-duty vehicles other than MDPVs in subsection (b)(3)(C) shall calculate fleet average NMOG+NO_x credits in accordance with subsection (c)(2)(B).

(A) Calculation of Vehicle-Equivalent NMOG + NO_x Credits for Medium-Duty Vehicles Other than MDPVs.

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

$$(1.00) \times \{[(\text{No. of LEV395s and LEV630s Produced excluding HEVs}) + (\text{No. of LEV395 HEVs} \times \text{HEV VEC factor for LEV395s}) + (\text{No. of LEV630 HEVs} \times \text{HEV VEC factor for LEV630s})] - (\text{No. of LEV395s and LEV630s Required to be Produced})\} +$$

$$(1.14) \times \{[(\text{No. of ULEV340s and ULEV570s Produced excluding HEVs}) + (\text{No. of ULEV340 HEVs} \times \text{HEV VEC factor for ULEV340s}) + (\text{No. of ULEV570 HEVs} \times \text{HEV VEC factor for ULEV570s})] - (\text{No. of ULEV340s and ULEV570s Required to be Produced})\} +$$

$$(1.37) \times \{[(\text{No. of ULEV250s and ULEV400s Produced excluding HEVs}) + (\text{No. of ULEV250 HEVs} \times \text{HEV VEC factor for ULEV250s}) + (\text{No. of ULEV400 HEVs} \times \text{HEV VEC factor for ULEV400s})] - (\text{No. of ULEV250s and ULEV400s Required to be Produced})\} +$$

$$(1.49) \times \{[(\text{No. of ULEV200s and ULEV270s Produced excluding HEVs}) + (\text{No. of ULEV200 HEVs} \times \text{HEV VEC factor for ULEV200s}) +$$

(No. of ULEV270 HEVs x HEV VEC factor
 for ULEV270s)] - (No. of ULEV200s and
 ULEV270s Required to be Produced))} +
 (1.57) x {[(No. of SULEV170s and SULEV230s Produced
 excluding HEVs) + (No. of SULEV170 HEVs x HEV VEC
 factor for SULEV170s) +
 (No. of SULEV230 HEVs x HEV VEC factor
 for SULEV230s)] - (No. of SULEV170s and
 SULEV230s Required to be Produced))} +

 (1.62) x {[(No. of SULEV150s and SULEV200s Produced
 excluding HEVs) + (No. of SULEV150 HEVs x HEV VEC
 factor for SULEV150s) +
 (No. of SULEV200 HEVs x HEV VEC factor
 for SULEV200s)] - (No. of SULEV150s and
 SULEV200s Required to be Produced))}
 + [(2.00) x (No. of ZEVs Certified and
 Produced as MDVs)].

2. MDV HEV VEC factor. The MDV HEV factor is calculated as follows:

$$\text{For LEV395s: } 1 + \frac{(\text{LEV395standard} - \text{ULEV340standard}) \times \text{Zero-emission VMT Allowance}}{\text{LEV395standard}}$$

$$\text{For ULEV340s: } 1 + \frac{(\text{ULEV340standard} - \text{ULEV250standard}) \times \text{Zero-emission VMT Allowance}}{\text{ULEV340standard}}$$

$$\text{For ULEV250s: } 1 + \frac{(\text{ULEV250standard} - \text{ULEV170standard}) \times \text{Zero-emission VMT Allowance}}{\text{ULEV250standard}}$$

$$\text{For ULEV200s: } 1 + \frac{(\text{ULEV200standard} - \text{SULEV170standard}) \times \text{Zero-emission VMT Allowance}}{\text{ULEV200standard}}$$

$$\text{For SULEV170s: } 1 + \frac{(\text{SULEV170standard} - \text{SULEV170standard}) \times \text{Zero-emission VMT Allowance}}{\text{SULEV170standard}}$$

$$\text{For SULEV150s: } 1 + \frac{(\text{SULEV150standard} - \text{ZEV standard}) \times \text{Zero-emission VMT Allowance}}{\text{SULEV150standard}}$$

$$\text{For LEV630s: } 1 + \frac{(\text{LEV630standard} - \text{ULEV570standard}) \times \text{Zero-emission VMT Allowance}}{\text{LEV630standard}}$$

$$\text{For ULEV570s: } 1 + \frac{(\text{ULEV570standard} - \text{ULEV400standard}) \times \text{Zero-emission VMT Allowance}}{\text{ULEV570standard}}$$

$$\text{For ULEV400s: } 1 + \frac{(\text{ULEV400standard} - \text{ULEV270standard}) \times \text{Zero-emission VMT Allowance}}{\text{ULEV400standard}}$$

$$\text{For ULEV270s: } 1 + \frac{(\text{ULEV270standard} - \text{SULEV230standard}) \times \text{Zero-emission VMT Allowance}}{\text{ULEV270standard}}$$

$$\text{For SULEV230s: } 1 + \frac{(\text{SULEV230standard} - \text{SULEV200standard}) \times \text{Zero-emission VMT Allowance}}{\text{SULEV230standard}}$$

$$\text{For SULEV200s: } 1 + \frac{(\text{SULEV200standard} - \text{ZEV standard}) \times \text{Zero-emission VMT Allowance}}{\text{SULEV200standard}}$$

where “Zero-emission VMT Allowance” for an HEV is determined in accordance with section C of the “California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” incorporated by reference in section 1962.1, or the “California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” incorporated by reference in section 1962.2, as applicable, except that for the purposes of this subsection (c)(2)(B), the maximum allowable Zero-emission VMT Allowance that may be used in these equations is 1.0.

3. A manufacturer that fails to produce and deliver for sale in California the equivalent quantity of MDVs certified to LEV III exhaust emission standards, shall receive “Vehicle-Equivalent Debits” (or “VEDs”) equal to the amount of negative VECs determined by the equation in subsection (c)(2)(A).

(B) Calculation of Fleet Average NMOG+NOx Credits and Debits for Medium-Duty Vehicles Other than MDPVs.

1. In 2016 and subsequent model years, a manufacturer shall calculate its medium-duty vehicle fleet average credits or debits using the following equation.

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

2. In 2016 and subsequent model years, a manufacturer that achieves fleet average NMOG+NOx values lower than the fleet average NMOG+NOx requirement for the corresponding model year shall receive credits in units of g/mi NMOG+NOx. A manufacturer with 2016 and subsequent model year fleet average NMOG+NOx values greater than the fleet average requirement for the corresponding model year shall receive debits in units of g/mi NMOG+NOx equal to the amount of negative credits determined by the aforementioned equation. The total g/mi NMOG+NOx credits or debits earned for MDVs 8,501-10,000 lbs. GVWR excluding MDPVs, and for MDVs 10,001-14,000 lbs. GVWR shall be summed together. The resulting amount shall constitute the g/mi NMOG+NOx credits or debits accrued by the manufacturer for the model year. Medium-duty fleet average credits and debits earned in accordance with subsection (c)(2)(B) may not be summed together with fleet average credits and debits earned for passenger cars, light-duty trucks, and medium-duty passenger vehicles in accordance with subsection (c)(1).

(C) Only ZEVs certified as MDVs and not used to meet the ZEV requirement shall be included in the calculation of VECs or the calculation of NMOG+NOx credits and debits.

(3) Procedure for Offsetting Debits.

- (A) A manufacturer shall equalize emission debits by earning g/mi NMOG+NOx emission credits or VECs in an amount equal to the g/mi NMOG+NOx debits or VEDs, or by submitting a commensurate amount of g/mi NMOG+NOx credits or VECs to the Executive Officer that were earned previously or acquired from another manufacturer. A manufacturer shall equalize NMOG+NOx debits for PCs, LDTs, and MDPVs and VEC debits or NMOG+NOx debits, as applicable, for MDVs within three model years. If emission debits are not equalized within the specified time period, the manufacturer shall be subject to the Health and Safety Code §43211 civil penalty applicable to a manufacturer which sells a new motor vehicle that does not meet the applicable emission standards adopted by the state board. The cause of action shall be deemed to accrue when the emission debits are not equalized by the end of the specified time period. A manufacturer demonstrating compliance under Option 2 in subsection (b)(1)(A)1.a, must calculate the emission debits that are subject to a civil penalty under Health and Safety Code section 43211 separately for California, the District of Columbia, and for each individual state that is included in the fleet average greenhouse gas requirements in subsection (b)(1)(A)1.a. The manufacturer must calculate these emission debits separately for California, the District of Columbia, and each individual state using the formula in subsections (c)(1) and (c)(2), except that the "Total No. of Vehicles Produced and Delivered for Sale in California, Including ZEVs and HEVs" shall be calculated separately for the District of Columbia and each individual state.

For the purposes of Health and Safety Code §43211, the number of passenger cars, light-duty trucks, and medium-duty passenger vehicles not meeting the state board's emission standards shall be determined by dividing the total amount of g/mi NMOG+NOx emission debits for the model year by the g/mi NMOG+NOx fleet average requirement for PCs and LDTs 0-3750 lbs. LVW and for LDTs 3751 lbs. LVW - 8500 lbs. GVW and MDPVs applicable for the model year in which the debits were first incurred; and the number of medium-duty vehicles not meeting the state board's emission standards shall be equal to the amount of VEDs incurred or shall be determined by dividing the total amount of g/mi NMOG+NOx emission debits for the model year by the g/mi NMOG+NOx fleet average requirement for MDVs 8,501-10,000 lbs. GVW and for MDVs 10,001 lbs. – 14,000 lbs. GVW applicable for the model year in which the debits were first incurred.

- (B) The emission credits earned in any given model year shall retain full value through five subsequent model years. Credits will have no value if not used by the beginning of the sixth model year after being earned.
- (4) *Changing NMOG Credits and Debits to NMOG+NO_x Credits and Debits.* The value of any emission credits that have not been used prior to the start of the 2015 model year and any emission debits that have not been equalized prior to the start of the 2015 model year earned shall be converted to NMOG+NO_x credits at the start of the 2015 model year by multiplying their values by a factor of 3.0. These credits and debits are subject to the provisions in subsection 1961(c)(3).
- (5) *Changing Vehicle-Equivalent Credits and Debits to NMOG+NO_x Fleet Average Credits and Debits.* The value of any vehicle-equivalent credits and debits earned in accordance with subsection (c)(2) or subsection 1961(c)(2) shall be converted to NMOG+NO_x fleet average credits and debits using the provisions in subsection (c)(2)(B), for each model year in which the credits or debits are accrued. For the purpose of applying the formula in subsection (c)(2)(B)1, for credits and debits earned in accordance with subsection 1961(c)(2), the Fleet Average NMOG+NO_x Requirement is 0.364 g/mi for MDVs between 8,501-10,000 lbs. GVWR and 0.592 g/mi for MDVs between 10,001-14,000 lbs. GVWR. These credits and debits are subject to the provisions in subsection (c)(3) or subsection 1961(c)(3), as applicable, based on the model year in which they are first earned as vehicle-equivalent credits or debits.

- (d) *Test Procedures.* The certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” as amended December 6, 2012, the “California Non-Methane Organic Gas Test Procedures for 1993 through 2016 Model Year Vehicles,” as amended September 2, 2015, and the “California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent Model Year Vehicles,” as adopted September 2, 2015, which are all incorporated herein by reference. In the case of hybrid electric vehicles and on-board fuel-fired heaters, the certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the “California Exhaust Emission Standards and Test Procedures for 2009 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, and the “California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” incorporated by reference in section 1962.2.
- (e) *Abbreviations.* The following abbreviations are used in this section:
- “ALVW” means adjusted loaded vehicle weight
- “ASTM” means American Society of Testing and Materials. “CO” means carbon monoxide.
- “FTP” means Federal Test Procedure. “g/mi” means grams per mile.
- “GVW” means gross vehicle weight.
- “GVWR” means gross vehicle weight rating.
- “HEV” means hybrid-electric vehicle.
- “LDT” means light-duty truck.
- “LDT1” means a light-duty truck with a loaded vehicle weight of 0-3750 pounds.
- “LDT2” means a light-duty truck with a loaded vehicle weight of 3751 pounds to a gross vehicle weight rating of 8500 pounds.
- “LEV” means low-emission vehicle.
- “LPG” means liquefied petroleum gas.
- “LVW” means loaded vehicle weight.
- “MDPV” means medium-duty passenger vehicle.

“MDV” means medium-duty vehicle.

“NMHC” means non-methane hydrocarbons. “mg/mi” means milligrams per mile.

“NMHC” means non-methane hydrocarbons.

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

“NOx” means oxides of nitrogen.

“PC” means passenger car.

“SULEV” means super-ultra-low-emission vehicle.

“ULEV” means ultra-low-emission vehicle.

“VEC” means vehicle-equivalent credits.

“VED” means vehicle-equivalent debits.

“VMT” means vehicle miles traveled.

“ZEV” means zero-emission vehicle.

- (f) Severability. Each provision of this section is severable, and in the event that any provision of this section is held to be invalid, the remainder of both this section and this article remains in full force and effect.

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

Title 13, California Code of Regulations

Adopt Section 1961.3.1 of title 13, California Code of Regulations, to read as follows:

§ 1961.3.1 Greenhouse Gas Exhaust Emission Standards and Test Procedures--2017 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles. (Alternative)

Introduction.

This section 1961.3.1 sets the greenhouse gas emission levels from new 2017 and subsequent model year passenger cars, light-duty trucks, and medium-duty passenger vehicles. Light-duty trucks from 3751 lbs. LVW - 8500 lbs. GVW that are certified to the Option 1 LEV II NO_x Standard in section 1961(a)(1) are exempt from these greenhouse gas emission requirements, however, passenger cars, light-duty trucks 0-3750 lbs. LVW, and medium-duty passenger vehicles are not eligible for this exemption.

Emergency vehicles may be excluded from these greenhouse gas emission requirements. The manufacturer must notify the Executive Officer that they are making such an election, in writing, prior to the start of the applicable model year or must comply with this section 1961.3.1.

(a) Greenhouse Gas Emission Requirements.

(1) Fleet Average Carbon Dioxide Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.

For the purpose of determining compliance with this subsection (a)(1), the applicable fleet average CO₂ mass emission standards for each model year is the sales-weighted average of the calculated CO₂ exhaust mass emission target values for each manufacturer. For each model year, the sales-weighted fleet average CO₂ mass emissions value shall not exceed the sales-weighted average of the calculated CO₂ exhaust mass emission target values for that manufacturer.

(A) Fleet Average Carbon Dioxide Target Values for Passenger Cars.

The fleet average CO₂ exhaust mass emission target values for passenger cars that are produced and delivered for sale in California each model year shall be determined as follows:

1. For passenger cars with a footprint of less than or equal to 41 square feet, the gram per mile CO₂ target value shall be selected for the appropriate model year from the following table:

<i>Model Year</i>	<i>CO₂ Target Value (grams/mile)</i>
2017	195.0

2018	185.0
2019	175.0
2020	166.0
2021	157.0
2022	150.0
2023	143.0
2024	137.0
2025 and subsequent	131.0

2. For passenger cars with a footprint of greater than 56 square feet, the gram per mile CO₂ target value shall be selected for the appropriate model year from the following table:

<i>Model Year</i>	<i>CO₂ Target Value (grams/mile)</i>
2017	263.0
2018	250.0
2019	238.0
2020	226.0
2021	215.0
2022	205.0
2023	196.0
2024	188.0
2025 and subsequent	179.0

3. For passenger cars with a footprint that is greater than 41 square feet and less than or equal to 56 square feet, the gram per mile CO₂ target value shall be calculated using the following equation and rounded to the nearest 0.1 grams/mile:

$$\text{Target gCO}_2/\text{mile} = [a \times f] + b$$

Where: f is the vehicle footprint and coefficients a and b are selected from the following table for the applicable model year.

<i>Model Year</i>	<i>a</i>	<i>b</i>
2017	4.53	8.9
2018	4.35	6.5
2019	4.17	4.2
2020	4.01	1.9
2021	3.84	-0.4

2022	3.69	-1.1
2023	3.54	-1.8
2024	3.4	-2.5
2025 and subsequent	3.26	-3.2

- (B) Fleet Average Carbon Dioxide Target Values for Light-Duty Trucks and Medium-Duty Passenger Vehicles. The fleet average CO₂ exhaust mass emission target values for light-duty trucks and medium-duty passenger vehicles that are produced and delivered for sale in California each model year shall be determined as follows:

- For light-duty trucks and medium-duty passenger vehicles with a footprint of less than or equal to 41 square feet, the gram per mile CO₂ target value shall be selected from the following table:

<i>Model Year</i>	<i>CO₂ Target Value (grams/mile)</i>
2017	238.0
2018	227.0
2019	220.0
2020	212.0
2021	195.0
2022	186.0
2023	176.0
2024	168.0
2025 and subsequent	159.0

- For light-duty trucks and medium-duty passenger vehicles with a footprint of greater than 41 square feet and less than or equal to the maximum footprint value specified in the table below for each model year, the gram/mile CO₂ target value shall be calculated using the following equation and rounded to the nearest 0.1 grams/mile:

$$\text{Target gCO}_2/\text{mile} = [a \times f] + b$$

Where: f is the vehicle footprint and coefficients a and b are selected from the following table for the applicable model year.

<i>Model year</i>	<i>Maximum Footprint</i>	<i>a</i>	<i>b</i>
2017	50.7	4.87	38.3
2018	60.2	4.76	31.6
2019	66.4	4.68	27.7

2020	68.3	4.57	24.6
2021	73.5	4.28	19.8
2022	74.0	4.09	17.8
2023	74.0	3.91	16.0
2024	74.0	3.74	14.2
2025 and subsequent	74.0	3.58	12.5

3. For light-duty trucks and medium-duty passenger vehicles with a footprint that is greater than the minimum footprint value specified in the table below and less than or equal to the maximum footprint value specified in the table below for each model year, the gram/mile CO₂ target value shall be calculated using the following equation and rounded to the nearest 0.1 grams/mile:

$$\text{Target gCO}_2/\text{mile} = [a \times f] + b$$

Where: f is the vehicle footprint and coefficients a and b are selected from the following table for the applicable model year.

<i>Model year</i>	<i>Minimum Footprint</i>	<i>Maximum Footprint</i>	<i>a</i>	<i>b</i>
2017	50.7	66.0	4.04	80.5
2018	60.2	66.0	4.04	75.0

4. For light-duty trucks and medium-duty passenger vehicles with a footprint that is greater than the minimum value specified in the table below for each model year, the gram/mile CO₂ target value shall be selected for the applicable model year from the following table:

<i>Model year</i>	<i>Minimum Footprint</i>	<i>CO₂ target value (grams/mile)</i>
2017	66.0	347.0
2018	66.0	342.0
2019	66.4	339.0
2020	68.3	337.0
2021	73.5	335.0
2022	74.0	321.0
2023	74.0	306.0
2024	74.0	291.0
2025 and subsequent	74.0	277.0

- (C) Calculation of Manufacturer-Specific Carbon Dioxide Fleet Average Standards. For each model year, each manufacturer must comply with fleet average CO₂ standards for passenger cars and for light-duty trucks plus medium-duty passenger vehicles, as applicable, calculated for that model year as follows. For each model year, a manufacturer must calculate separate fleet average CO₂ values for its passenger car fleet and for its combined light-duty truck plus medium-duty passenger vehicle fleet using the CO₂ target values in subsection (a)(A). These calculated CO₂ values are the manufacturer-specific fleet average CO₂ standards for passenger cars and for light-duty trucks plus medium-duty passenger vehicles, as applicable, which apply for that model year.
1. A CO₂ target value shall be calculated in accordance with subparagraph (a)(1)(A) or (a)(1)(B), as applicable, for each unique combination of model type and footprint value.
 2. Each CO₂ target value, determined for each unique combination of model type and footprint value, shall be multiplied by the total production of that model type/footprint combination for the applicable model year.
 3. The resulting products shall be summed, and that sum shall be divided by the total production of passenger cars or total combined production of light-duty trucks and medium-duty passenger vehicles, as applicable, in that model year. The result shall be rounded to the nearest whole gram per mile. This result shall be the applicable fleet average CO₂ standard for the manufacturer's passenger car fleet or its combined light-duty truck and medium-duty passenger vehicle fleet, as applicable.

- (2) Nitrous Oxide (N₂O) and Methane (CH₄) Exhaust Emission Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles. Each manufacturer's fleet of combined passenger automobile, light-duty trucks, and medium-duty passenger vehicles must comply with N₂O and CH₄ standards using either the provisions of subsection (a)(2)(A), subsection (a)(2)(B), or subsection (a)(2)(C). Except with prior approval of the Executive Officer, a manufacturer may not use the provisions of both subsection (a)(2)(A) and subsection (a)(2)(B) in the same model year. For example, a manufacturer may not use the provisions of subsection (a)(2)(A) for their passenger automobile fleet and the provisions of subsection (a)(2)(B) for their light-duty truck and medium-duty passenger vehicle fleet in the same model year. The manufacturer may use the provisions of both subsections (a)(2)(A) and (a)(2)(C) in the same model year. For example, a manufacturer may meet the N₂O standard in subsection (a)(2)(A)1 and an alternative CH₄ standard determined under subsection (a)(2)(C).

(A) Standards Applicable to Each Test Group.

1. Exhaust emissions of N₂O shall not exceed 0.010 grams per mile at full useful life, as measured on the FTP (40 CFR, Part 86, Subpart B), as amended by the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light Duty Trucks, and Medium Duty Vehicles." Manufacturers may optionally determine an alternative N₂O standard under subsection (a)(2)(C).
2. Exhaust emissions of CH₄ shall not exceed 0.030 grams per mile at full useful life, as measured on the FTP (40 CFR, Part 86, Subpart B), as amended by the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles." Manufacturers may optionally determine an alternative CH₄ standard under subsection (a)(2)(C).

- (B) Including N₂O and CH₄ in Fleet Averaging Program. Manufacturers may elect to not meet the emission standards in subsection (a)(2)(A). Manufacturers making this election shall measure N₂O and CH₄ emissions for each unique combination of model type and footprint value on both the FTP test cycle and the Highway Fuel Economy test cycle at full useful life, multiply the measured N₂O emissions value by 298 and the measured CH₄ emissions value by 25, and include both of these adjusted N₂O and CH₄ full useful life values in the fleet average calculations for passenger automobiles and light-duty trucks plus medium-duty passenger vehicles, as calculated in accordance with subsection (a)(2)(A)(D).
- (C) Optional Use of Alternative N₂O and/or CH₄ Standards. Manufacturers may select an alternative standard applicable to a test group, for either N₂O or CH₄, or both. For example, a manufacturer may choose to meet the N₂O standard in subsection (a)(2)(A)1 and an alternative CH₄ standard in lieu of the standard in subsection (a)(2)(A)2. The alternative standard for each pollutant must be less stringent than the applicable exhaust emission standard specified in subsection (a)(2)(A). Alternative N₂O and CH₄ standards apply to emissions as measured on the FTP (40 CFR, Part 86, Subpart B), as amended by the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” for the full useful life, and become the applicable certification and in-use emission standard(s) for the test group. Manufacturers using an alternative standard for N₂O and/or CH₄ must calculate emission debits according to the provisions of subsection (a)(2)(D) for each test group/alternative standard combination. Debits must be included in the calculation of total credits or debits generated in a model year as required under subsection (b)(1)(B). Flexible fuel vehicles (or other vehicles certified for multiple fuels) must meet these alternative standards when tested on all applicable test fuel type.
- (D) CO₂-Equivalent Debits. CO₂-equivalent debits for test groups using an alternative N₂O and/or CH₄ standard as determined under (a)(2)(C) shall be calculated according to the following equation and rounded to the nearest whole gram per mile:

$$\text{Debits} = \text{GWP} \times (\text{Production}) \times (\text{AltStd} - \text{Std})$$

Where:

Debits = N₂O or CH₄ CO₂-equivalent debits for a test group using an alternative N₂O or CH₄ standard;

GWP = 25 if calculating CH₄ debits and 298 if calculating N₂O debits;

Production = The number of vehicles of that test group produced and delivered for sale in California;

AltStd = The alternative standard (N₂O or CH₄) selected by the manufacturer under (a)(2)(C); and

Std = The exhaust emission standard for N₂O or CH₄ specified in (a)(2)(A).

- (3) *Alternative Fleet Average Standards for Manufacturers with Limited U.S. Sales.* Manufacturers meeting the criteria in this subsection (a)(3) may request that the Executive Officer establish alternative fleet average CO₂ standards that would apply instead of the standards in subsection (a)(1).
- (A) *Eligibility for Alternative Standards.* Eligibility as determined in this subsection (a)(3) shall be based on the total sales of combined passenger cars, light-duty trucks, and medium-duty passenger vehicles. The terms “sales” and “sold” as used in this subsection (a)(3) shall mean vehicles produced and delivered for sale (or sold) in the states and territories of the United States. For the purpose of determining eligibility the sales of related companies shall be aggregated according to the provisions of section 1900. To be eligible for alternative standards established under this subsection (a)(3), the manufacturer's average sales for the three most recent consecutive model years must remain below 5,000. If a manufacturer's average sales for the three most recent consecutive model years exceeds 4,999, the manufacturer will no longer be eligible for exemption and must meet applicable emission standards as follows.
1. If a manufacturer's average sales for three consecutive model years exceeds 4,999, and if the increase in sales is the result of corporate acquisitions, mergers, or purchase by another manufacturer, the manufacturer shall comply with the emission standards described in subsections (a)(1) and (a)(2), as applicable, beginning with the first model year after the last year of the three consecutive model years.
 2. If a manufacturer's average sales for three consecutive model years exceeds 4,999 and is less than 50,000, and if the increase in sales is solely the result of the manufacturer's expansion in vehicle production (not the result of corporate acquisitions, mergers, or purchase by another manufacturer), the manufacturer shall comply with the emission standards described in subsections (a)(1) and (a)(2), as applicable, beginning with the second model year after the last year of the three consecutive model years.

- (B) *Requirements for New Entrants into the U.S. Market.* New entrants are those manufacturers without a prior record of automobile sales in the United States and without prior certification to (or exemption from, under 40 CFR § 86.1801-12(k)) greenhouse gas emission standards in 40 CFR § 86.1818-12 or greenhouse gas standards in section 1961.1. In addition to the eligibility requirements stated in subsection (a)(3)(A), new entrants must meet the following requirements:
1. In addition to the information required under subsection (a)(3)(D), new entrants must provide documentation that shows a clear intent by the company to actually enter the U.S. market in the years for which alternative standards are requested. Demonstrating such intent could include providing documentation that shows the establishment of a U.S. dealer network, documentation of work underway to meet other U.S. requirements (e.g., safety standards), or other information that reasonably establishes intent to the satisfaction of the Executive Officer.
 2. Sales of vehicles in the U.S. by new entrants must remain below 5,000 vehicles for the first two model years in the U.S. market and the average sales for any three consecutive years within the first five years of entering the U.S. market must remain below 5,000 vehicles. Vehicles sold in violation of these limits will be considered not covered by the certificate of conformity and the manufacturer will be subject to penalties on an individual-vehicle basis for sale of vehicles not covered by a certificate. In addition, violation of these limits will result in loss of eligibility for alternative standards until such point as the manufacturer demonstrates two consecutive model years of sales below 5,000 automobiles.
 3. A manufacturer with sales in the most recent model year of less than 5,000 automobiles, but where prior model year sales were not less than 5,000 automobiles, is eligible to request alternative standards under subsection (a)(3). However, such a manufacturer will be considered a new entrant and subject to the provisions regarding new entrants in this subsection (a)(3), except that the requirement to demonstrate an intent to enter the U.S. market in subsection (a)(3)(B)(1) shall not apply.

- (C) How to Request Alternative Fleet Average Standards. Eligible manufacturers may petition for alternative standards for up to five consecutive model years if sufficient information is available on which to base such standards.
1. To request alternative standards starting with the 2017 model year, eligible manufacturers must submit a completed application no later than July 30, 2013.
 2. To request alternative standards starting with a model after 2017, eligible manufacturers must submit a completed application no later than 36 months prior to the start of the first model year to which the alternative standards would apply.
 3. The application must contain all the information required in subsection (a)(3)(D), and must be signed by a chief officer of the company. If the Executive Officer determines that the content of the request is incomplete or insufficient, the manufacturer will be notified and given an additional 30 days to amend the request.
 4. A manufacturer may elect to petition for alternative standards under this subsection (a)(3)(C) by submitting to ARB a copy of the data and information submitted to EPA as required under 40 CFR § 86.1818-12(g), incorporated by reference in and amended by the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” and the EPA approval of the manufacturer’s request for alternative fleet average standards for the 2017 through 2025 MY National Greenhouse Gas Program.

(D) Data and Information Submittal Requirements. Eligible manufacturers requesting alternative standards under subsection (a)(3) must submit the following information to the California Air Resources Board. The Executive Officer may request additional information as s/he deems appropriate. The completed request must be sent to the California Air Resources Board at the following address: Chief, Emissions Certification and Compliance Division, California Air Resources Board, 4001 Iowa Avenue, Riverside, CA 92507.

1. Vehicle Model and Fleet Information.

- a. The model years to which the requested alternative standards would apply, limited to five consecutive model years.
- b. Vehicle models and projections of production volumes for each model year.
- c. Detailed description of each model, including the vehicle type, vehicle mass, power, footprint, and expected pricing.
- d. The expected production cycle for each model, including new model introductions and redesign or refresh cycles.

2. Technology Evaluation Information.

- a. The CO₂ reduction technologies employed by the manufacturer on each vehicle model, including information regarding the cost and CO₂ -reducing effectiveness. Include technologies that improve air conditioning efficiency and reduce air conditioning system leakage, and any “off-cycle” technologies that potentially provide benefits outside the operation represented by the FTP and the HWFET.

- b. An evaluation of comparable models from other manufacturers, including CO₂ results and air conditioning credits generated by the models. Comparable vehicles should be similar, but not necessarily identical, in the following respects: vehicle type, horsepower, mass, power-to-weight ratio, footprint, retail price, and any other relevant factors. For manufacturers requesting alternative standards starting with the 2017 model year, the analysis of comparable vehicles should include vehicles from the 2012 and 2013 model years, otherwise the analysis should at a minimum include vehicles from the most recent two model years.
 - c. A discussion of the CO₂-reducing technologies employed on vehicles offered outside of the U.S. market but not available in the U.S., including a discussion as to why those vehicles and/or technologies are not being used to achieve CO₂ reductions for vehicles in the U.S. market.
 - d. An evaluation, at a minimum, of the technologies projected by the California Air Resources Board in the “Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider the “LEV III” Amendments to The California Greenhouse Gas and Criteria Pollutant Exhaust and Evaporative Emission Standards and Test Procedures and to the On-Board Diagnostic System Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and to the Evaporative Emission Requirements for Heavy-Duty Vehicles” and the appendices to this report, released on December 7, 2011, as those technologies likely to be used to meet greenhouse gas emission standards and the extent to which those technologies are employed or projected to be employed by the manufacturer. For any technology that is not projected to be fully employed, the manufacturer must explain why this is the case.
3. Information Supporting Eligibility.

- a. U.S. sales for the three previous model years and projected sales for the model years for which the manufacturer is seeking alternative standards.
 - b. Information regarding ownership relationships with other manufacturers, including details regarding the application of the provisions of 40 CFR § 86.1838-01(b)(3) and section 1900 regarding the aggregation of sales of related companies.
- (E) Alternative Standards. Upon receiving a complete application, the Executive Officer will review the application and determine whether an alternative standard is warranted. If the Executive Officer judges that an alternative standard is warranted, the following standards shall apply. For the purposes of this subsection (a)(3)(E), an “ultra-small volume manufacturer” shall mean a manufacturer that meets the requirements of subsection (a)(3).
 - 1. At the beginning of the model year that is three model years prior to the model year for which an alternative standard is requested, each ultra-small volume manufacturer shall identify all vehicle models from the model year that is four model years prior to the model year for which an alternative standard is requested, certified by a large volume manufacturer that are comparable to that small volume manufacturer's vehicle models for the model year for which an alternative standard is requested, based on model type and footprint value. The ultra-small volume manufacturer shall demonstrate to the Executive Officer the appropriateness of each comparable vehicle model selected. Upon approval of the Executive Officer, s/he shall provide to the ultra-small volume manufacturer the target grams CO₂ per mile for each vehicle model type and footprint value that is approved. The ultra-small volume manufacturer shall calculate its fleet average CO₂ standard in accordance with subsection (a)(1)(C) based on these target grams CO₂ per mile values provided by the Executive Officer.
 - 2. In the 2017 and subsequent model years, an ultra-small volume manufacturer shall either:
 - a. not exceed its fleet average CO₂ standard calculated in accordance with subsection (a)(1)(C) based on the target grams CO₂ per mile values provided by the Executive Officer; or

- b. upon approval of the Executive Officer, if an ultra-small volume manufacturer demonstrates a vehicle model uses an engine, transmission, and emission control system and has a footprint value that are identical to a configuration certified for sale in California by a large volume manufacturer, those ultra-small volume manufacturer vehicle models are exempt from meeting the requirements in paragraph 2.a of this subsection.
- (F) Restrictions on Credit Trading. Manufacturers subject to alternative standards approved by the Executive Officer under this subsection (a)(3) may not trade credits to another manufacturer. Transfers of credits between a manufacturer's car and truck fleets are allowed.
- (4) Greenhouse Gas Emissions Values for Electric Vehicles, "Plug-In" Hybrid Electric Vehicles, and Fuel Cell Vehicles.
- (A) Electric Vehicle Calculations.
1. For each unique combination of model type and footprint value, a manufacturer shall calculate the City CO₂ Value using the following formula:

$$\text{City CO}_2 \text{ Value} = (270 \text{ gCO}_2\text{e/kWh}) * E_{EV} - 0.25 * \text{CO}_2 \text{ target}$$
 Where E_{EV} is measured directly from each cycle for each test vehicle of battery electric vehicle technology in units of kilowatt-hours per mile (per SAE J1634, incorporated herein by reference).
 2. For each unique combination of model type and footprint value, a manufacturer shall calculate the Highway CO₂ Value using the following formula:

$$\text{Highway CO}_2 \text{ Value} = (270 \text{ gCO}_2\text{e/kWh}) * E_{EV} - 0.25 * \text{CO}_2 \text{ target}$$
 Where E_{EV} is measured directly from each cycle for each test vehicle of battery electric vehicle technology in units of kilowatt-hours per mile (per SAE J1634, incorporated herein by reference).
- (B) "Plug-In" Hybrid Electric Vehicle Calculations. For each unique combination of model type and footprint value, a manufacturer shall calculate the City CO₂ Value and the Highway CO₂ Value using the following formulas:
- $$\text{City CO}_2 \text{ Value} = \text{GHG}_{\text{urban}}$$
- and
- $$\text{Highway CO}_2 \text{ Value} = \text{GHG}_{\text{highway}}$$

Where GHG_{urban} and GHG_{highway} are measured in accordance with section G.12 of the “California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes” or the “California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” as applicable.

- (C) **Fuel Cell Vehicle Calculations.** For each unique combination of model type and footprint value, a manufacturer shall calculate the City CO₂ Value and the Highway CO₂ Value using the following formulas:

City CO₂ = $GHG_{\text{FCV}} = (9132 \text{ gCO}_2\text{e/kg H}_2) * H_{\text{FCV}} - G_{\text{upstream}}$
and

Highway CO₂ = $GHG_{\text{FCV}} = (9132 \text{ gCO}_2\text{e/kg H}_2) * H_{\text{FCV}} - G_{\text{upstream}}$ Where H_{FCV} means hydrogen consumption in kilograms of hydrogen per mile, measured for the applicable test cycle, in accordance with SAE J2572 (published October 2008), incorporated herein by reference.

- (5) **Calculation of Fleet Average Carbon Dioxide Value.**

- (A) For each unique combination of model type and footprint value, a manufacturer shall calculate a combined city/highway CO₂ exhaust emission value as follows:

$0.55 \times \text{City CO}_2 \text{ Value} + 0.45 \times \text{Highway CO}_2 \text{ Value}$

“City” CO₂ exhaust emissions shall be measured using the FTP test cycle (40 CFR, Part 86, Subpart B), as amended by the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light Duty Trucks, and Medium Duty Vehicles.” “Highway” CO₂ exhaust emission shall be measured using the using the Highway Fuel Economy Test (HWFET; 40 CFR 600 Subpart B).

- (B) Each combined city/highway CO₂ exhaust emission, determined for each unique combination of model type and footprint value, shall be multiplied by the total production of that model type/footprint combination for the applicable model year.

- (C) The resulting products shall be summed, and that sum shall be divided by the total production of passenger cars or total combined production of light-duty trucks and medium-duty passenger vehicles, as applicable, in that model year. The result shall be rounded to the nearest whole gram per mile. This result shall be the manufacturer's actual sales-weighted fleet average CO₂ value for the manufacturer's passenger car fleet or its combined light-duty truck and medium-duty passenger vehicle fleet, as applicable.
- (D) For each model year, a manufacturer must demonstrate compliance with the fleet average requirements in section (a)(1) based on one of two options applicable throughout the model year, either:

Option 1: the total number of passenger cars, light-duty trucks, and medium-duty passenger vehicles that are certified to the California exhaust emission standards in section 1961.3.1, and are produced and delivered for sale in California; or

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

1. A manufacturer that selects compliance Option 2 must notify the Executive Officer of that selection, in writing, prior to the start of the applicable model year or must comply with Option 1. Once a manufacturer has selected compliance Option 2, that selection applies unless the manufacturer selects Option 1 and notifies the Executive Officer of that selection in writing before the start of the applicable model year.
2. When a manufacturer is demonstrating compliance using Option 2 for a given model year, the term "in California" as used in section means California, the District of Columbia, and all states that have adopted California's greenhouse gas emission standards for that model year pursuant to Section 177 of the federal Clean Air Act (42 U.S.C. § 7507).

3. A manufacturer that selects compliance Option 2 must provide to the Executive Officer separate values for the number of vehicles in each model type and footprint value produced and delivered for sale in the District of Columbia and for each individual state within the average and the City CO₂ Value and Highway CO₂ exhaust emission values that apply to each model type and footprint value.
- (6) Credits for Reduction of Air Conditioning Direct Emissions. Manufacturers may generate A/C Direct Emissions Credits by implementing specific air conditioning system technologies designed to reduce air conditioning direct emissions over the useful life of their vehicles. A manufacturer may only use an A/C Direct Emissions Credit for vehicles within a model type upon approval of the A/C Direct Emissions Credit for that model type by the Executive Officer. The conditions and requirements for obtaining approval of an A/C Direct Emissions Credit are described in (A) through (F), below.
- (A) Applications for approval of an A/C Direct Emissions Credit must be organized by model type. The applications must also include:
- vehicle make and
 - number of vehicles within the model type that will be equipped with the air conditioning system to which the leakage credit shall apply.
- Separate applications must be submitted for any two configurations of an A/C system with differences other than dimensional variation.
- (B) To obtain approval of the A/C Direct Emissions Credit, the manufacturer must demonstrate through an engineering evaluation that the A/C system under consideration reduces A/C direct emissions. The demonstration must include all of the following elements:
- the amount of A/C Direct Emissions Credit requested, in grams of CO₂-equivalent per mile (gCO₂e/mi);
 - the calculations identified in section (a)(6)(C) justifying that credit amount;
 - schematic of the A/C system;
 - specifications of the system components with sufficient detail to allow reproduction of the calculation; and
 - an explanation describing what efforts have been made to minimize the number of fittings and joints and to optimize the components in order to minimize leakage.

Calculated values must be carried to at least three significant figures throughout the calculations, and the final credit value must be rounded to one tenth of a gram of CO₂-equivalent per mile (gCO₂e/mi).

- (C) The calculation of A/C Direct Emissions Credit depends on the refrigerant or type of system, and is specified in paragraphs 1, 2, and 3 of this subsection.

1. HFC-134a vapor compression systems

For A/C systems that use HFC-134a refrigerant, the A/C Direct Emissions Credit is calculated using the following formula:

$$A/C \text{ Direct Credit} = \text{Direct Credit Baseline} \times \left(1 - \frac{LR}{\text{Avg LR}}\right)$$

Where:

Direct Credit Baseline = 12.6 gCO₂e/mi for passenger cars;

Direct Credit Baseline = 15.6 gCO₂e/mi for light-duty trucks and medium-duty passenger vehicles;

Avg LR = 16.6 grams/year for passenger cars;

Avg LR = 20.7 grams/year for light-duty trucks and medium-duty passenger vehicles;

LR = the larger of *SAE LR* or *Min LR*;

Where:

SAE LR = initial leak rate evaluated using SAE International's Surface Vehicle Standard SAE J2727 (Revised February 2012), incorporated by reference, herein;

Min LR = 8.3 grams/year for passenger car A/C systems with belt-driven compressors;

Min LR = 10.4 grams/year for light-duty truck and medium-duty passenger vehicle A/C systems with belt-driven compressors;

Min LR = 4.1 grams/year for passenger car A/C systems with electric compressors;

Min LR = 5.2 grams/year for light-duty truck and medium-duty passenger vehicle A/C systems with electric compressors.

Note: Initial leak rate is the rate of refrigerant leakage from a newly manufactured A/C system in grams of refrigerant per year. The Executive Officer may allow a manufacturer to use an updated version of SAE J2727 or an alternate method if s/he determines that the updated SAE J2727 or the alternate method provides more accurate estimates of the initial leak rate of A/C systems than the February 2012 version of SAE J2727 does.

2. Low-GWP vapor compression systems

For A/C systems that use a refrigerant having a GWP of 150 or less, the A/C Direct Emissions Credit shall be calculated using the following formula:

A/C Direct Credit = Low GWP Credit - High Leak Penalty

Where:

$$\text{Low GWP Credit} = \text{Max Low GWP Credit} \times \left(1 - \frac{\text{GWP}}{1,430}\right)$$

and

High Leak Penalty

$$= \begin{cases} \text{Max High Leak Penalty}, & \text{if } \text{SAE LR} > \text{Avg LR}; \\ \text{Max High Leak Penalty} \times \frac{\text{SAE LR} - \text{Min LR}}{\text{Avg LR} - \text{Min LR}}, & \text{if } \text{Min LR} < \text{SAE LR} \leq \text{Avg LR}; \\ 0, & \text{if } \text{SAE LR} \leq \text{Min LR}. \end{cases}$$

Where:

Max Low GWP Credit = 13.8 gCO₂e/mi for passenger cars;

Max Low GWP Credit = 17.2 gCO₂e/mi for light-duty trucks and medium-duty passenger vehicles;

GWP = the global warming potential of the refrigerant over a 100-year horizon, as specified in section (a)(6)(F);

Max High Leak Penalty = 1.8 gCO₂e/mi for passenger cars;

Max High Leak Penalty = 2.1 gCO₂e/mi for light-duty trucks and medium-duty passenger vehicles;

Avg LR = 13.1 g/yr for passenger cars;

Avg LR = 16.6 g/yr for light-duty trucks and medium-duty passenger vehicles;

and where:

SAE LR = initial leak rate evaluated using SAE International's Surface Vehicle Standard SAE J2727 (Revised February 2012);

Min LR = 8.3 g/yr for passenger cars;

Min LR = 10.4 g/yr for light-duty trucks and medium-duty passenger vehicles.

Note: Initial leak rate is the rate of refrigerant leakage from a newly manufactured A/C system in grams of refrigerant per year. The Executive Officer may allow a manufacturer to use an updated version of SAE J2727 or an alternate applicable test method if s/he finds the update or the alternate method provides more accurate estimates of the initial leak rate of A/C systems than the February 2012 version of SAE J2727 does.

3. Other A/C systems

For an A/C system that uses a technology other than vapor compression cycles, an A/C Direct Emissions Credit may be approved by the Executive Officer. The amount of credit requested must be based on demonstration of the reduction of A/C direct emissions of the technology using an engineering evaluation that includes verifiable laboratory test data, and cannot exceed 13.8 gCO₂e/mi for passenger cars and 17.2 gCO₂e/mi for light-duty trucks and medium-duty passenger vehicles.

- (D) The total leakage reduction credits generated by the air conditioning system shall be calculated separately for passenger cars, and for light-duty trucks and medium-duty passenger vehicles, according to the following formula:

$$\text{Total Credits (g/mi)} = \text{A/C Direct Credit} \times \text{Production}$$

Where:

A/C Direct Credit is calculated as specified in subsection (a)(6)(C).

Production = The total number of passenger cars or light-duty trucks plus medium-duty passenger vehicles, whichever is applicable, produced and delivered for sale in California, with the air conditioning system to which the *A/D Direct Credit* value from subsection (a)(6)(C) applies.

- (E) The results of subsection (a)(6)(D), rounded to the nearest whole gram per mile, shall be included in the manufacturer's credit/debit totals calculated in subsection (b)(1)(B).
- (F) The following values for refrigerant global warming potential (GWP), or alternative values as determined by the Executive Officer, shall be used in the calculations of this subsection (a)(6). The Executive Officer shall determine values for refrigerants not included in this subsection (a)(6)(F) upon request by a manufacturer, based on findings by the Intergovernmental Panel on Climate Change (IPCC) or from other applicable research studies.

<i>Refrigerant</i>	<i>GWP</i>
HFC-134a	1,430
HFC-152a	124
HFO-1234yf	4
CO ₂	1

- (7) Credits for Improving Air Conditioning System Efficiency. Manufacturers may generate CO₂ credits by implementing specific air conditioning system technologies designed to reduce air conditioning-related CO₂ emissions over the useful life of their passenger cars, light-duty trucks, and/or medium-duty passenger vehicles. Credits shall be calculated according to this subsection (a)(7) for each air conditioning system that the manufacturer is using to generate CO₂ credits. The eligibility requirements specified in subsection (a)(7)(E) must be met before an air conditioning system is allowed to generate credits.

- (A) Air conditioning efficiency credits are available for the following technologies in the gram per mile amounts indicated for each vehicle category in the following table:

<i>Air Conditioning Technology</i>	<i>Passenger Cars (g/mi)</i>	<i>Light-Duty Trucks and Medium-Duty Passenger Vehicles (g/mi)</i>
Reduced reheat, with externally-controlled, variable-displacement compressor (e.g. a compressor that controls displacement based on temperature setpoint and/or cooling demand of the air conditioning system control settings inside the passenger compartment).	1.5	2.2
Reduced reheat, with externally-controlled, fixed-displacement or pneumatic variable displacement compressor (e.g. a compressor that controls displacement based on conditions within, or internal to, the air conditioning system, such as head pressure, suction pressure, or evaporator outlet temperature).	1.0	1.4
Default to recirculated air with closed-loop control of the air supply (sensor feedback to control interior air quality) whenever the ambient temperature is 75 °F or higher: Air conditioning systems that operated with closed-loop control of the air supply at different temperatures may receive credits by submitting an engineering analysis to the Administrator for approval.	1.5	2.2
Default to recirculated air with open-loop control air supply (no sensor feedback) whenever the ambient temperature is 75 °F or higher. Air conditioning systems that operate with open-loop control of the air supply at different temperatures may receive credits by submitting an engineering analysis to the Administrator for approval.	1.0	1.4

Blower motor controls which limit wasted electrical energy (e.g. pulse width modulated power controller).	0.8	1.1
Internal heat exchanger (e.g. a device that transfers heat from the high-pressure, liquid-phase refrigerant entering the evaporator to the low-pressure, gas-phase refrigerant exiting the evaporator).	1.0	1.4
Improved condensers and/or evaporators with system analysis on the component(s) indicating a coefficient of performance improvement for the system of greater than 10% when compared to previous industry standard designs).	1.0	1.4
Oil separator. The manufacturer must submit an engineering analysis demonstrating the increased improvement of the system relative to the baseline design, where the baseline component for comparison is the version which a manufacturer most recently had in production on the same vehicle design or in a similar or related vehicle model. The characteristics of the baseline component shall be compared to the new component to demonstrate the improvement.	0.5	0.7

- (B) Air conditioning efficiency credits are determined on an air conditioning system basis. For each air conditioning system that is eligible for a credit based on the use of one or more of the items listed in subsection (a)(7)(A), the total credit value is the sum of the gram per mile values listed in subsection (a)(7)(A) for each item that applies to the air conditioning system. However, the total credit value for an air conditioning system may not be greater than 5.0 grams per mile for any passenger car or 7.2 grams per mile for any light-duty truck or medium-duty passenger vehicle.
- (C) The total efficiency credits generated by an air conditioning system shall be calculated separately for passenger cars and for light-duty trucks plus medium-duty passenger vehicles according to the following formula:

$$\text{Total Credits (g/mi)} = \text{Credit} \times \text{Production}$$

Where:

Credit = the CO₂ efficiency credit value in grams per mile determined in subsection (a)(7)(B) or (a)(7)(E), whichever is applicable.

Production = The total number of passenger cars or light-duty trucks plus medium-duty passenger vehicles, whichever is applicable, produced and delivered for sale in California, with the air conditioning system to which the efficiency credit value from subsection (a)(7)(B) applies.

- (D) The results of subsection (a)(7)(C), rounded to the nearest whole gram per mile, shall be included in the manufacturer's credit/debit totals calculated in subsection (b)(1)(B).
- (E) For the purposes of this subsection (a)(7)(E), the AC17 Test Procedure shall mean the AC17 Air Conditioning Efficiency Test Procedure set forth in 40 CFR § 86.167-17, incorporated in and amended by the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles."
 - 1. For each air conditioning system selected by the manufacturer to generate air conditioning efficiency credits, the manufacturer shall perform the AC17 Test Procedure.
 - 2. Using good engineering judgment, the manufacturer must select the vehicle configuration to be tested that is expected to result in the greatest increased CO₂ emissions as a result of the operation of the air conditioning system for which efficiency credits are being sought. If the air conditioning system is being installed in passenger cars, light-duty trucks, and medium-duty passenger vehicles, a separate determination of the quantity of credits for passenger cars and for light-duty trucks and medium-duty passenger vehicles must be made, but only one test vehicle is required to represent the air conditioning system, provided it represents the worst-case impact of the system on CO₂ emissions.
 - 3. For each air conditioning system selected by the manufacturer to generate air conditioning efficiency credits, the manufacturer shall perform the AC17 Test Procedure according to the following requirements. Each air conditioning system shall be tested as follows:
 - a. Perform the AC17 test on a vehicle that incorporates the air conditioning system with the credit-generating technologies.

- b. Perform the AC17 test on a vehicle which does not incorporate the credit-generating technologies. The tested vehicle must be similar to the vehicle tested under subsection (a)(7)(E)(3)a.
 - c. Subtract the CO₂ emissions determined from testing under subsection (a)(7)(E)(3)a from the CO₂ emissions determined from testing under subsection (a)(7)(E)(3)b and round to the nearest 0.1 grams/mile. If the result is less than or equal to zero, the air conditioning system is not eligible to generate credits. If the result is greater than or equal to the total of the gram per mile credits determined under subsection (a)(7)(B), then the air conditioning system is eligible to generate the maximum allowable value determined under subsection (a)(7)(B). If the result is greater than zero but less than the total of the gram per mile credits determined under subsection (a)(7)(B), then the air conditioning system is eligible to generate credits in the amount determined by subtracting the CO₂ emissions determined from testing under subsection (a)(7)(E)(3)a from the CO₂ emissions determined from testing under subsection (a)(7)(E)(3)b and rounding to the nearest 0.1 grams/mile.
4. For the first model year for which an air conditioning system is expected to generate credits, the manufacturer must select for testing the highest-selling subconfiguration within each vehicle platform that uses the air conditioning system. Credits may continue to be generated by the air conditioning system installed in a vehicle platform provided that:
- a. The air conditioning system components and/or control strategies do not change in any way that could be expected to cause a change in its efficiency;
 - b. The vehicle platform does not change in design such that the changes could be expected to cause a change in the efficiency of the air conditioning system; and

- c. The manufacturer continues to test at least one sub-configuration within each platform using the air conditioning system, in each model year, until all sub-configurations within each platform have been tested.
 - 5. Each air conditioning system must be tested and must meet the testing criteria in order to be allowed to generate credits. Using good engineering judgment, in the first model year for which an air conditioning system is expected to generate credits, the manufacturer must select for testing the highest-selling subconfiguration within each vehicle platform using the air conditioning system. Credits may continue to be generated by an air conditioning system in subsequent model years if the manufacturer continues to test at least one sub-configuration within each platform on annually, as long as the air conditioning system and vehicle platform do not change substantially.
- (8) Off-Cycle Credits. Manufacturers may generate credits for CO₂-reducing technologies where the CO₂ reduction benefit of the technology is not adequately captured on the FTP and/or the HWFET. These technologies must have a measurable, demonstrable, and verifiable real-world CO₂ reduction that occurs outside the conditions of the FTP and the HWFET. These optional credits are referred to as “off-cycle” credits. Off-cycle technologies used to generate emission credits are considered emission-related components subject to applicable requirements, and must be demonstrated to be effective for the full useful life of the vehicle. Unless the manufacturer demonstrates that the technology is not subject to in-use deterioration, the manufacturer must account for the deterioration in their analysis. The manufacturer must use one of the three options specified in this subsection (a)(8) to determine the CO₂ gram per mile credit applicable to an off-cycle technology. The manufacturer should notify the Executive Officer in its pre-model year report of its intention to generate any credits under this subsection (a)(8).
- (A) Credit available for certain off-cycle technologies.
- 1. The manufacturer may generate a CO₂ gram/mile credit for certain technologies as specified in the following table, provided that each technology is applied to the minimum percentage of the manufacturer's total U.S. production of passenger cars, light-duty trucks, and medium-duty passenger vehicles specified in the table in each model year for which credit is claimed. Technology definitions are in subsection (e).

<i>Off-Cycle Technology</i>	<i>Passenger Cars (g/mi)</i>	<i>Light-Duty Trucks and Medium-Duty Passenger Vehicles (g/mi)</i>	<i>Minimum Total Percent of U.S. Production</i>
Active aerodynamics	0.6	1.0	10
High efficiency exterior lighting	1.1	1.1	10
Engine heat recovery	0.7 per 100W of capacity	0.7 per 100W of capacity	10
Engine start-stop (idle-off)	2.9	4.5	10
Active transmission warm-up	1.8	1.8	10
Active engine warm-up	1.8	1.8	10
Electric heater circulation pump	1.0	1.5	n/a
Solar roof panels	3.0	3.0	n/a
Thermal control	≤3.0	≤4.3	n/a

- a. Credits may also be accrued for thermal control technologies as defined in subsection (e) in the amounts shown in the following table:

<i>Thermal Control Technology</i>	<i>Credit Value: Passenger Cars (g/mi)</i>	<i>Credit Value: Light-Duty Trucks and Medium-Duty Passenger Vehicles (g/mi)</i>
Glass or glazing	≤2.9	≤3.9
Active seat ventilation	1.0	1.3
Solar reflective paint	0.4	0.5
Passive cabin ventilation	1.7	2.3
Active cabin ventilation	2.1	2.8

- b. The maximum credit allowed for thermal control technologies is limited to 3.0 g/mi for passenger cars and to 4.3 g/mi for light-duty trucks and medium-duty passenger vehicles. The maximum credit allowed for glass or glazing is limited to 2.9 g/mi for passenger cars and to 3.9 g/mi for light-duty trucks and medium-duty passenger vehicles.
- c. Glass or glazing credits are calculated using the following equation:

$$Credit = Z \times \sum_{i=1}^n \frac{T_i \times G_i}{G}$$

Where:

Credit = the total glass or glazing credits, in grams per mile, for a vehicle, which may not exceed 3.0 g/mi for passenger cars or 4.3 g/mi for light-duty trucks and medium-duty passenger vehicles;

Z = 0.3 for passenger cars and 0.4 for light-duty trucks and medium-duty passenger vehicles;

G_i = the measured glass area of window i, in square meters and rounded to the nearest tenth;

G = the total glass area of the vehicle, in square meters and rounded to the nearest tenth;

T_i = the estimated temperature reduction for the glass area of window i, determined using the following formula:

$$T_i = 0.3987 \times (T_{ts_{base}} - T_{ts_{new}})$$

Where:

T_{ts_{new}} = the total solar transmittance of the glass, measured according to ISO 13837:2008, "Safety glazing materials -- Method for determination of solar transmittance" (incorporated by reference, herein).

T_{ts_{base}} = 62 for the windshield, side-front, side-rear, rear-quarter, and backlite locations, and 40 for roofite locations.

2. The maximum allowable decrease in the manufacturer's combined passenger car and light-duty truck plus medium-duty passenger vehicle fleet average CO₂ emissions attributable to use of the default credit values in subsection (a)(8)(A)1 is 10 grams per mile. If the total of the CO₂ g/mi credit values from the table in subsection (a)(8)(A)1 does not exceed 10 g/mi for any passenger automobile or light truck in a manufacturer's fleet, then the total off-cycle credits may be calculated according to subsection (a)(8)(D). If the total of the CO₂ g/mi credit values from the table in subsection (a)(8)(A)1 exceeds 10 g/mi for any passenger car, light-duty truck, or medium-duty passenger vehicle in a manufacturer's fleet, then the gram per mile decrease for the combined passenger car and light-duty truck plus medium-duty passenger vehicle fleet must be determined according to subsection (a)(8)(A)2.a to determine whether the 10 g/mi limitation has been exceeded.

- a. Determine the gram per mile decrease for the combined passenger car and light-duty truck plus medium-duty passenger vehicle fleet using the following formula:

$$\text{Decrease} = \frac{\text{Credits} \times 1,000,000}{[(\text{Prod}_C \times 195,264) + (\text{Prod}_T \times 225,865)]}$$

Where:

Credits = The total of passenger car and light-duty truck plus medium-duty passenger vehicles credits, in Megagrams, determined according to subsection (a)(8)(D) and limited to those credits accrued by using the default gram per mile values in subsection (a)(8)(A)1.

Prod_C = The number of passenger cars produced by the manufacturer and delivered for sale in the U.S.

Prod_T = The number of light-duty trucks and medium-duty passenger vehicles produced by the manufacturer and delivered for sale in the U.S.

- b. If the value determined in subsection (a)(8)(A)2.a is greater than 10 grams per mile, the total credits, in Megagrams, that may be accrued by a manufacturer using the default gram per mile values in subsection (a)(8)(A)1 shall be determined using the following formula:

$$\text{Credit (Megagrams)} = \frac{[10 \times ((\text{Prod}_C \times 195,264) + (\text{Prod}_T \times 225,865))]}{1,000,000}$$

Where:

Prod_C = The number of passenger cars produced by the manufacturer and delivered for sale in the U.S.

Prod_T = The number of light-duty trucks and medium-duty passenger vehicles produced by the manufacturer and delivered for sale in the U.S.

- c. If the value determined in subsection (a)(8)(A)2.a is not greater than 10 grams per mile, then the credits that may be accrued by a manufacturer using the default gram per mile values in subsection (a)(8)(A)1 do not exceed the allowable limit, and total credits may be determined for each category of vehicles according to subsection (a)(8)(D).
 - d. If the value determined in subsection (a)(8)(A)2.a is greater than 10 grams per mile, then the combined passenger car and light-duty truck plus medium-duty passenger vehicle credits, in Megagrams, that may be accrued using the calculations in subsection (a)(8)(D) must not exceed the value determined in subsection (a)(8)(A)2.b. This limitation should generally be done by reducing the amount of credits attributable to the vehicle category that caused the limit to be exceeded such that the total value does not exceed the value determined in subsection (a)(8)(A)2.b.
 - 3. In lieu of using the default gram per mile values specified in subsection (a)(8)(A)1 for specific technologies, a manufacturer may determine an alternative value for any of the specified technologies. An alternative value must be determined using one of the methods specified in subsection (a)(8)(B) or subsection (a)(8)(C).
- (B) Technology demonstration using EPA 5-cycle methodology. To demonstrate an off-cycle technology and to determine a CO₂ credit using the EPA 5-cycle methodology, the manufacturer shall determine the off-cycle city/highway combined carbon-related exhaust emissions benefit by using the EPA 5-cycle methodology described in 40 CFR Part 600. Testing shall be performed on a representative vehicle, selected using good engineering judgment, for each model type for which the credit is being demonstrated. The emission benefit of a technology is determined by testing both with and without the off-cycle technology operating. Multiple off-cycle technologies may be demonstrated on a test vehicle. The manufacturer shall conduct the following steps and submit all test data to the Executive Officer.

1. Testing without the off-cycle technology installed and/or operating. Determine carbon-related exhaust emissions over the FTP, the HWFET, the US06, the SC03, and the cold temperature FTP test procedures according to the test procedure provisions specified in 40 CFR part 600 subpart B and using the calculation procedures specified in § 600.113-08 of this chapter. Run each of these tests a minimum of three times without the off-cycle technology installed and operating and average the per phase (bag) results for each test procedure. Calculate the 5-cycle weighted city/highway combined carbon-related exhaust emissions from the averaged per phase results, where the 5-cycle city value is weighted 55% and the 5-cycle highway value is weighted 45%. The resulting combined city/highway value is the baseline 5-cycle carbon-related exhaust emission value for the vehicle.
2. Testing with the off-cycle technology installed and/or operating. Determine carbon-related exhaust emissions over the US06, the SC03, and the cold temperature FTP test procedures according to the test procedure provisions specified in 40 CFR part 600 subpart B and using the calculation procedures specified in 40 CFR § 600.113-08. Run each of these tests a minimum of three times with the off-cycle technology installed and operating and average the per phase (bag) results for each test procedure. Calculate the 5-cycle weighted city/highway combined carbon-related exhaust emissions from the averaged per phase results, where the 5-cycle city value is weighted 55% and the 5-cycle highway value is weighted 45%. Use the averaged per phase results for the FTP and HWFET determined in subsection (a)(8)(B)1 for operation without the off-cycle technology in this calculation. The resulting combined city/highway value is the 5-cycle carbon-related exhaust emission value showing the off-cycle benefit of the technology but excluding any benefit of the technology on the FTP and HWFET.

3. Subtract the combined city/highway value determined in subsection (a)(8)(B)1 from the value determined in subsection (a)(8)(B)2. The result is the off-cycle benefit of the technology or technologies being evaluated. If this benefit is greater than or equal to three percent of the value determined in subsection (a)(8)(B)1 then the manufacturer may use this value, rounded to the nearest tenth of a gram per mile, to determine credits under subsection (a)(8)(C).
4. If the value calculated in subsection (a)(8)(B)3 is less than two percent of the value determined in subsection (a)(8)(B)1, then the manufacturer must repeat the testing required under subsections (a)(8)(B)1 and (a)(8)(B)2, except instead of running each test three times they shall run each test two additional times. The off-cycle benefit of the technology or technologies being evaluated shall be calculated as in subsection (a)(8)(B)3 using all the tests conducted under subsections (a)(8)(B)1, (a)(8)(B)2, and (a)(8)(B)4. If the value calculated in subsection (a)(8)(B)3 is less than two percent of the value determined in subsection (a)(8)(B)1, then the manufacturer must verify the emission reduction potential of the off-cycle technology or technologies using the EPA Vehicle Simulation Tool, and if the results support a credit value that is less than two percent of the value determined in subsection (a)(8)(B)1 then the manufacturer may use the off-cycle benefit of the technology or technologies calculated as in subsection (a)(8)(B)3 using all the tests conducted under subsections (a)(8)(B)1, (a)(8)(B)2, and (a)(8)(B)4, rounded to the nearest tenth of a gram per mile, to determine credits under subsection (a)(8)(C).

(C) Review and approval process for off-cycle credits.

1. Initial steps required.
 - a. A manufacturer requesting off-cycle credits under the provisions of subsection (a)(8)(B) must conduct the testing and/or simulation described in that paragraph.
 - b. A manufacturer requesting off-cycle credits under subsection (a)(8)(B) must conduct testing and/or prepare engineering analyses that demonstrate the in-use durability of the technology for the full useful life of the vehicle.

2. Data and information requirements. The manufacturer seeking off-cycle credits must submit an application for off-cycle credits determined under subsection (a)(8)(B). The application must contain the following:
 - a. A detailed description of the off-cycle technology and how it functions to reduce CO₂ emissions under conditions not represented on the FTP and HWFET.
 - b. A list of the vehicle model(s) which will be equipped with the technology.
 - c. A detailed description of the test vehicles selected and an engineering analysis that supports the selection of those vehicles for testing.
 - d. All testing and/or simulation data required under subsection (a)(8)(B), as applicable, plus any other data the manufacturer has considered in the analysis.
 - e. An estimate of the off-cycle benefit by vehicle model and the fleet-wide benefit based on projected sales of vehicle models equipped with the technology.
 - f. An engineering analysis and/or component durability testing data or whole vehicle testing data demonstrating the in-use durability of the off-cycle technology components.
3. Review of the off-cycle credit application. Upon receipt of an application from a manufacturer, the Executive Officer will do the following:
 - a. Review the application for completeness and notify the manufacturer within 30 days if additional information is required.
 - b. Review the data and information provided in the application to determine if the application supports the level of credits estimated by the manufacturer.
4. Decision on off-cycle application.

The Executive Officer will notify the manufacturer in writing of its decision to approve or deny the application within 60 days of receiving a complete application, and if denied, the Executive Officer will provide the reasons for the denial.

- (D) Calculation of total off-cycle credits. Total off-cycle credits in grams per mile of CO₂ (rounded to the nearest tenth of a gram per mile) shall be calculated separately for passenger cars and light-duty trucks plus medium-duty passenger vehicles according to the following formula:

Total Credits (g/mi) = Credit x Production

Where:

Credit = the credit value in grams per mile determined in subsection (a)(8)(A) or subsection (a)(8)(B).

Production = The total number of passenger cars or light-duty trucks plus medium-duty passenger vehicles, whichever is applicable, produced and delivered for sale in California, produced with the off-cycle technology to which the credit value determined in subsection (a)(8)(A) or subsection (a)(8)(B) applies.

- (9) Credits for certain full-size pickup trucks.

Full-size pickup trucks may be eligible for additional credits based on the implementation of hybrid technologies or on exhaust emission performance, as described in this subsection (a)(9). Credits may be generated under either subsection (a)(9)(A) or subsection (a)(9)(B) for a qualifying pickup truck, but not both.

- (A) Credits for implementation of gasoline-electric hybrid technology. Full-size pickup trucks that implement hybrid gasoline-electric technologies may be eligible for an additional credit under this subsection (a)(9)(A). Pickup trucks using the credits under this subsection (a)(9)(A) may not use the credits described in subsection (a)(9)(B).
1. Full-size pickup trucks that are mild hybrid gasoline-electric vehicles and that are produced in the 2017 through 2021 model years are eligible for a credit of 10 grams/mile. To receive this credit, the manufacturer must produce a quantity of mild hybrid full-size pickup trucks such that the proportion of production of such vehicles, when compared to the manufacturer's total production of full-size pickup trucks, is not less than the amount specified in the table below for each model year.

<i>Model year</i>	<i>Required minimum percent of full-size pickup trucks</i>
2017	30%
2018	40%
2019	55%
2020	70%
2021	80%

2. Full-size pickup trucks that are strong hybrid gasoline-electric vehicles and that are produced in the 2017 through 2025 model years are eligible for a credit of 20 grams/mile. To receive this credit, the manufacturer must produce a quantity of strong hybrid full-size pickup trucks such that the proportion of production of such vehicles, when compared to the manufacturer's total production of full-size pickup trucks, is not less than 10 percent for each model year.
- (B) Credits for emission reduction performance. 2017 through 2021 model year full-size pickup trucks that achieve carbon-related exhaust emission values below the applicable target value determined in subsection (a)(1)(B) may be eligible for an additional credit. Pickup trucks using the credits under this subsection (a)(9)(B) may not use the credits described in subsection (a)(9)(A).
1. Full-size pickup trucks that achieve carbon-related exhaust emissions less than or equal to the applicable target value determined in subsection (a)(1)(B) multiplied by 0.85 (rounded to the nearest gram per mile) and greater than the applicable target value determined in subsection (a)(1)(B) multiplied by 0.80 (rounded to the nearest gram per mile) in a model year are eligible for a credit of 10 grams/mile. A pickup truck that qualifies for this credit in a model year may claim this credit for subsequent model years through the 2021 model year if the carbon-related exhaust emissions of that pickup truck do not increase relative to the emissions in the model year in which the pickup truck qualified for the credit. To qualify for this credit in each model year, the manufacturer must produce a quantity of full-size pickup trucks that meet the emission requirements of this subsection (a)(9)(B)1 such that the proportion of production of such vehicles, when compared to the manufacturer's total production of full-size pickup trucks, is not less than the amount specified in the table below for each model year.

<i>Model year</i>	<i>Required minimum percent of full-size pickup trucks</i>
2017	15%
2018	20%
2019	28%
2020	35%
2021	40%

2. Full-size pickup trucks that achieve carbon-related exhaust emissions less than or equal to the applicable target value determined in subsection (a)(1)(B) multiplied by 0.80 (rounded to the nearest gram per mile) in a model year are eligible for a credit of 20 grams/mile. A pickup truck that qualifies for this credit in a model year may claim this credit for a maximum of five subsequent model years if the carbon-related exhaust emissions of that pickup truck do not increase relative to the emissions in the model year in which the pickup truck first qualified for the credit. This credit may not be claimed in any model year after 2025. To qualify for this credit, the manufacturer must produce a quantity of full-size pickup trucks that meet the emission requirements of subsection (a)(9)(B)1 such that the proportion of production of such vehicles, when compared to the manufacturer's total production of full-size pickup trucks, is not less than 10 percent in each model year.
- (C) Calculation of total full-size pickup truck credits. Total credits in grams per mile of CO₂ (rounded to the nearest whole gram per mile) shall be calculated for qualifying full-size pickup trucks according to the following formula:

$$\text{Total Credits (g/mi)} = (10 \times \text{Production}_{10}) + (20 \times \text{Production}_{20})$$

Where:

Production₁₀ = The total number of full-size pickup trucks produced and delivered for sale in California with a credit value of 10 grams per mile from subsection (a)(9)(A) and subsection (a)(9)(B).

Production₂₀ = The total number of full-size pickup trucks produced and delivered for sale in California with a credit value of 20 grams per mile from subsection (a)(9)(A) and subsection (a)(9)(B).

- (10) Greenhouse Gas In-Use Compliance Standards. The in-use exhaust CO₂ emission standard shall be the combined city/highway exhaust emission value calculated according to the provisions of subsection (a)(5)(A) for the vehicle model type and footprint value multiplied by 1.1 and rounded to the nearest whole gram per mile. For vehicles that are capable of operating on multiple fuels, a separate value shall be determined for each fuel that the vehicle is capable of operating on. These standards apply to in-use testing performed by the manufacturer pursuant to the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.”
- (11) Mid-Term Review of the 2022 through 2025 MY Standards. The Executive Officer shall conduct a mid-term review to re-evaluate the state of vehicle technology to determine whether any adjustments to the stringency of the 2022 through 2025 model year standards are appropriate. California's mid-term review will be coordinated with its planned full participation in EPA's mid-term evaluation as set forth in 40 CFR § 86.1818-12 (h).
- (b) Calculation of Greenhouse Gas Credits/Debits. Credits that are earned as part of the 2012 through 2016 MY National greenhouse gas program shall not be applicable to California's greenhouse gas program. Debits that are earned as part of the 2012 through 2016 MY National greenhouse gas program shall not be applicable to California's greenhouse gas program.
- (1) Calculation of Greenhouse Gas Credits for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.
- (A) A manufacturer that achieves fleet average CO₂ values lower than the fleet average CO₂ requirement for the corresponding model year shall receive credits for each model year in units of g/mi. A manufacturer that achieves fleet average CO₂ values higher than the fleet average CO₂ requirement for the corresponding model year shall receive debits for each model year in units of g/mi. Manufacturers must calculate greenhouse gas credits and greenhouse gas debits separately for passenger cars and for combined light-duty trucks and medium-duty passenger vehicles as follows:
- CO₂ Credits or Debits = (CO₂ Standard - Manufacturer's Fleet Average CO₂ Value) x (Total No. of Vehicles Produced and Delivered for Sale in California, Including ZEVs and HEVs).
- Where:
- CO₂ Standard = the applicable standard for the model year as determined in subsection (a)(1)(C);

Manufacturer's Fleet Average CO₂ Value = average calculated according to subsection (a)(5);

- (B) A manufacturer's total Greenhouse Gas credits or debits generated in a model year shall be the sum of its CO₂ credits or debits and any of the following credits or debits, if applicable. The manufacturer shall calculate, maintain, and report Greenhouse Gas credits or debits separately for its passenger car fleet and for its light-duty truck plus medium-duty passenger vehicle fleet.
 - 1. Air conditioning leakage credits earned according to the provisions of subsection (a)(6);
 - 2. Air conditioning efficiency credits earned according to the provisions of subsection (a)(7);
 - 3. Off-cycle technology credits earned according to the provisions of subsection (a)(8).
 - 4. CO₂-equivalent debits earned according to the provisions of subsection (a)(2)(D).
- (2) A manufacturer with 2017 and subsequent model year fleet average Greenhouse Gas values greater than the fleet average CO₂ standard applicable for the corresponding model year shall receive debits in units of g/mi Greenhouse Gas equal to the amount of negative credits determined by the aforementioned equation. For the 2017 and subsequent model years, the total g/mi Greenhouse Gas credits or debits earned for passenger cars and for light-duty trucks and medium-duty passenger vehicles shall be summed together. The resulting amount shall constitute the g/mi Greenhouse Gas credits or debits accrued by the manufacturer for the model year.
- (3) Procedure for Offsetting Greenhouse Gas Debits.

- (A) A manufacturer shall equalize Greenhouse Gas emission debits by earning g/mi Greenhouse Gas emission credits in an amount equal to the g/mi Greenhouse Gas debits, or by submitting a commensurate amount of g/mi Greenhouse Gas credits to the Executive Officer that were earned previously or acquired from another manufacturer. A manufacturer shall equalize combined Greenhouse Gas debits for passenger cars, light-duty trucks, and medium-duty passenger vehicles within five model years after they are earned. If emission debits are not equalized within the specified time period, the manufacturer shall be subject to the Health and Safety Code section 43211 civil penalty applicable to a manufacturer which sells a new motor vehicle that does not meet the applicable emission standards adopted by the state board. The cause of action shall be deemed to accrue when the emission debits are not equalized by the end of the specified time period. For a manufacturer demonstrating compliance under Option 2 in subsection (a)(5)(D), the emission debits that are subject to a civil penalty under Health and Safety Code section 43211 shall be calculated separately for California, the District of Columbia, and each individual state that is included in the fleet average greenhouse gas requirements in subsection (a)(1). These emission debits shall be calculated for each individual state using the formula in subsections (b)(1) and (b)(2), except that the "Total No. of Vehicles Produced and Delivered for Sale in California, including ZEVs and HEVs" shall be calculated separately for the District of Columbia and each individual state.

For the purposes of Health and Safety Code section 43211, the number of passenger cars not meeting the state board's emission standards shall be determined by dividing the total amount of g/mi Greenhouse Gas emission debits for the model year calculated for California by the g/mi Greenhouse Gas fleet average requirement for passenger car applicable for the model year in which the debits were first incurred. For the purposes of Health and Safety Code section 43211, the number of light-duty trucks and medium-duty passenger vehicles not meeting the state board's emission standards shall be determined by dividing the total amount of g/mi Greenhouse Gas emission debits for the model year calculated for California by the g/mi Greenhouse Gas fleet average requirement for light-duty trucks and medium-duty passenger vehicles, applicable for the model year in which the debits were first incurred.

- (B) Greenhouse Gas emission credits earned in the 2017 and subsequent model years shall retain full value through the fifth model year after they are earned, and will have no value if not used by the beginning of the sixth model year after being earned.

- (4) Use of Greenhouse Gas Emission Credits to Offset a Manufacturer's ZEV Obligations.
 - (A) For a given model year, a manufacturer that has Greenhouse Gas credits remaining after equalizing all of its Greenhouse Gas debits may use those Greenhouse Gas credits to comply with its ZEV obligations for that model year, in accordance with the provisions set forth in the "California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," incorporated by reference in section 1962.2.
 - (B) Any Greenhouse Gas credits used by a manufacturer to comply with its ZEV obligations shall retain no value for the purposes of complying with this section 1961.3.1.
- (5) Credits and debits that are earned as part of the 2012 through 2016 MY National Greenhouse Gas Program, shall have no value for the purpose of complying with this section 1961.3.1.
- (c) Optional Compliance with the 2017 through 2025 MY National Greenhouse Gas Program.

For the 2017 through 2025 model years, a manufacturer may elect to demonstrate compliance with this section 1961.3.1 by demonstrating compliance with the 2017 through 2025 MY National greenhouse gas program as follows:

- (1) A manufacturer that selects compliance with this option must notify the Executive Officer of that selection, in writing, prior to the start of the applicable model year or must comply with 1961.3.1 (a) and (b);
- (2) The manufacturer must submit to ARB all data that it submits to EPA in accordance with the reporting requirements as required under 40 CFR § 86.1865-12, incorporated by reference in and amended by the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," for demonstrating compliance with the 2017 through 2025 MY National greenhouse gas program and the EPA determination of compliance. All such data must be submitted within 30 days of receipt of the EPA determination of compliance for each model year that a manufacturer selects compliance with this option;

- (3) The manufacturer must provide to the Executive Officer separate values for the number of vehicles in each model type and footprint value produced and delivered for sale in California, the District of Columbia, and each individual state that has adopted California's greenhouse gas emission standards for that model year pursuant to Section 177 of the federal Clean Air Act (42 U.S.C. § 7507), the applicable fleet average CO₂ standards for each of these model types and footprint values, the calculated fleet average CO₂ value for each of these model types and footprint values, and all values used in calculating the fleet average CO₂ values.
- (d) **Test Procedures.** The certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," incorporated by reference in section 1961.2. In the case of hybrid electric vehicles, the certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the "California Exhaust Emission Standards and Test Procedures for 2009 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, or the "California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," incorporated by reference in section 1962.2, as applicable.
- (e) **Abbreviations.** The following abbreviations are used in this section:
- "CFR" means Code of Federal Regulations.
 - "CH₄" means methane.
 - "CO₂" means carbon dioxide.
 - "FTP" means Federal Test Procedure.
 - "GHG" means greenhouse gas.
 - "g/mi" means grams per mile.
 - "GVW" means gross vehicle weight.
 - "GVWR" means gross vehicle weight rating.
 - "GWP" means the global warming potential.
 - "HEV" means hybrid-electric vehicle.
 - "HWFET" means Highway Fuel Economy Test (HWFET; 40 CFR 600 Subpart B).
 - "LDT" means light-duty truck.
 - "LVW" means loaded vehicle weight.
 - "MDPV" means medium-duty passenger vehicle.
 - "mg/mi" means milligrams per mile.
 - "MY" means model year.
 - "NHTSA" means National Highway Traffic Safety Administration.

“N₂O” means nitrous oxide.

“ZEV” means zero-emission vehicle.

- (f) Definitions Specific to this Section. The following definitions apply to this section 1961.3.1:
- (1) “A/C Direct Emissions” means any refrigerant released from a motor vehicle's air conditioning system.
 - (2) “Active Aerodynamic Improvements” means technologies that are activated only at certain speeds to improve aerodynamic efficiency by a minimum of three percent, while preserving other vehicle attributes or functions.
 - (3) “Active Cabin Ventilation” means devices that mechanically move heated air from the cabin interior to the exterior of the vehicle.
 - (4) “Active Transmission Warmup” means a system that uses waste heat from the exhaust system to warm the transmission fluid to an operating temperature range quickly using a heat exchanger in the exhaust system, increasing the overall transmission efficiency by reducing parasitic losses associated with the transmission fluid, such as losses related to friction and fluid viscosity.
 - (5) “Active Engine Warmup” means a system using waste heat from the exhaust system to warm up targeted parts of the engine so that it reduces engine friction losses and enables the closed-loop fuel control to activate more quickly. It allows a faster transition from cold operation to warm operation, decreasing CO₂ emissions.
 - (6) “Active Seat Ventilation” means a device that draws air from the seating surface which is in contact with the occupant and exhausts it to a location away from the seat.
 - (7) “Blower motor controls which limit waste energy” means a method of controlling fan and blower speeds that does not use resistive elements to decrease the voltage supplied to the motor.

- (8) “Default to recirculated air mode” means that the default position of the mechanism which controls the source of air supplied to the air conditioning system shall change from outside air to recirculated air when the operator or the automatic climate control system has engaged the air conditioning system (i.e., evaporator is removing heat), except under those conditions where dehumidification is required for visibility (i.e., defogger mode). In vehicles equipped with interior air quality sensors (e.g., humidity sensor, or carbon dioxide sensor), the controls may determine proper blend of air supply sources to maintain freshness of the cabin air and prevent fogging of windows while continuing to maximize the use of recirculated air. At any time, the vehicle operator may manually select the non-recirculated air setting during vehicle operation but the system must default to recirculated air mode on subsequent vehicle operations (i.e., next vehicle start). The climate control system may delay switching to recirculation mode until the interior air temperature is less than the outside air temperature, at which time the system must switch to recirculated air mode.
- (9) “Electric Heater Circulation Pump” means a pump system installed in a stop-start equipped vehicle or in a hybrid electric vehicle or plug-in hybrid electric vehicle that continues to circulate hot coolant through the heater core when the engine is stopped during a stop-start event. This system must be calibrated to keep the engine off for 1 minute or more when the external ambient temperature is 30 deg F.
- (10) “Emergency Vehicle” means a motor vehicle manufactured primarily for use as an ambulance or combination ambulance-hearse or for use by the United States Government or a State or local government for law enforcement.
- (11) “Engine Heat Recovery” means a system that captures heat that would otherwise be lost through the exhaust system or through the radiator and converting that heat to electrical energy that is used to meet the electrical requirements of the vehicle. Such a system must have a capacity of at least 100W to achieve 0.7 g/mi of credit. Every additional 100W of capacity will result in an additional 0.7 g/mi of credit.
- (12) “Engine Start-Stop” means a technology which enables a vehicle to automatically turn off the engine when the vehicle comes to a rest and restart the engine when the driver applies pressure to the accelerator or releases the brake.
- (13) “EPA Vehicle Simulation Tool” means the “EPA Vehicle Simulation Tool” as incorporated by reference in 40 CFR § 86.1 in the Notice of Proposed Rulemaking for EPA's 2017 and subsequent MY National Greenhouse Gas Program, as proposed at 76 Fed. Reg. 74854, 75357 (December 1, 2011).

- (14) “Executive Officer” means the Executive Officer of the California Air Resources Board.
- (15) “Footprint” means the product of average track width (rounded to the nearest tenth of an inch) and wheelbase (measured in inches and rounded to the nearest tenth of an inch), divided by 144 and then rounded to the nearest tenth of a square foot, where the average track width is the average of the front and rear track widths, where each is measured in inches and rounded to the nearest tenth of an inch.
- (16) “Federal Test Procedure” or “FTP” means 40 CFR, Part 86, Subpart B, as amended by the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.”
- (17) “Full-size pickup truck” means a light-duty truck that has a passenger compartment and an open cargo box and which meets the following specifications:
 - 1. A minimum cargo bed width between the wheelhouses of 48 inches, measured as the minimum lateral distance between the limiting interferences (pass-through) of the wheelhouses. The measurement shall exclude the transitional arc, local protrusions, and depressions or pockets, if present. An open cargo box means a vehicle where the cargo box does not have a permanent roof or cover. Vehicles produced with detachable covers are considered “open” for the purposes of these criteria.
 - 2. A minimum open cargo box length of 60 inches, where the length is defined by the lesser of the pickup bed length at the top of the body and the pickup bed length at the floor, where the length at the top of the body is defined as the longitudinal distance from the inside front of the pickup bed to the inside of the closed endgate as measured at the height of the top of the open pickup bed along vehicle centerline, and the length at the floor is defined as the longitudinal distance from the inside front of the pickup bed to the inside of the closed endgate as measured at the cargo floor surface along vehicle centerline.
 - 3. A minimum towing capability of 5,000 pounds, where minimum towing capability is determined by subtracting the gross vehicle weight rating from the gross combined weight rating, or a minimum payload capability of 1,700 pounds, where minimum payload capability is determined by subtracting the curb weight from the gross vehicle weight rating.

- (18) “Greenhouse Gas” means the following gases: carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons.
- (19) “GWP” means the global warming potential of the refrigerant over a 100-year horizon, as specified in Intergovernmental Panel on Climate Change (IPCC) 2007: Climate Change 2007 -- The Physical Science Basis. S. Solomon et al. (editors), Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, UK and New York, NY, USA, ISBN 0-521-70596-7, or determined by ARB if such information is not available in the IPCC Fourth Assessment Report.
- (20) “High Efficiency Exterior Lighting” means a lighting technology that, when installed on the vehicle, is expected to reduce the total electrical demand of the exterior lighting system by a minimum of 60 watts when compared to conventional lighting systems. To be eligible for this credit the high efficiency lighting must be installed in the following components: parking/position, front and rear turn signals, front and rear side markers, stop/brake lights (including the center-mounted location), taillights, backup/reverse lights, and license plate lighting.
- (21) “Improved condensers and/or evaporators” means that the coefficient of performance (COP) of air conditioning system using improved evaporator and condenser designs is 10 percent higher, as determined using the bench test procedures described in SAE J2765 “Procedure for Measuring System COP of a Mobile Air Conditioning System on a Test Bench,” when compared to a system using standard, or prior model year, component designs. SAE J2765 is incorporated by reference herein. The manufacturer must submit an engineering analysis demonstrating the increased improvement of the system relative to the baseline design, where the baseline component(s) for comparison is the version which a manufacturer most recently had in production on the same vehicle design or in a similar or related vehicle model. The dimensional characteristics (e.g., tube configuration/thickness/spacing, and fin density) of the baseline component(s) shall be compared to the new component(s) to demonstrate the improvement in coefficient of performance.
- (22) “Mild hybrid gasoline-electric vehicle” means a vehicle that has start/stop capability and regenerative braking capability, where the recaptured braking energy over the FTP is at least 15 percent but less than 75 percent of the total braking energy, where the percent of recaptured braking energy is measured and calculated according to 40 CFR § 600.108(g).
- (23) “Model Type” means a unique combination of car line, basic engine, and transmission class.

- (24) “2012 through 2016 MY National Greenhouse Gas Program” means the national program that applies to new 2012 through 2016 model year passenger cars, light-duty-trucks, and medium-duty passenger vehicles as adopted by the U.S. Environmental Protection Agency on April 1, 2010 (75 Fed. Reg. 25324, 25677 (May 7, 2010)).
- (25) “2017 through 2025 MY National Greenhouse Gas Program” means the national program that applies to new 2017 through 2025 model year passenger cars, light-duty-trucks, and medium-duty passenger vehicles as adopted by the U.S. Environmental Protection Agency as codified in 40 CFR Part 86, Subpart S, except as follows: For model years 2021 through 2025, the “2017 through 2025 MY National Greenhouse Gas Program” means the national program that applies to new 2021 through 2025 model year passenger cars, light-duty-trucks, and medium-duty passenger vehicles as adopted by the U.S. Environmental Protection Agency as codified in 40 CFR Part 86, Subpart S, as last amended on October 25, 2016 that incorporates CFR sections 86.1818-12 (October 25, 2016), 86.1865-12 (October 25, 2016), 86.1866-12 (October 25, 2016), 86.1867-12 (October 25, 2016), 86.1868-12 (October 25, 2016), 86.1869-12 (October 25, 2016), 86.1870-12 (October 25, 2016), and 86.1871-12 (October 25, 2016).
- (26) “Oil separator” means a mechanism that removes at least 50 percent of the oil entrained in the oil/refrigerant mixture exiting the compressor and returns it to the compressor housing or compressor inlet, or a compressor design that does not rely on the circulation of an oil/refrigerant mixture for lubrication.
- (27) “Passive Cabin Ventilation” means ducts or devices which utilize convective airflow to move heated air from the cabin interior to the exterior of the vehicle.
- (28) “Plug-in Hybrid Electric Vehicle” means “off-vehicle charge capable hybrid electric vehicle” as defined in 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.”
- (29) “Reduced reheat, with externally controlled, fixed-displacement or pneumatic variable displacement compressor” means a system in which the output of either compressor is controlled by cycling the compressor clutch off-and-on via an electronic signal, based on input from sensors (e.g., position or setpoint of interior temperature control, interior temperature, evaporator outlet air temperature, or refrigerant temperature) and air temperature at the outlet of the evaporator can be controlled to a level at 41°F, or higher.

- (30) “Reduced reheat, with externally-controlled, variable displacement compressor” means a system in which compressor displacement is controlled via an electronic signal, based on input from sensors (e.g., position or setpoint of interior temperature control, interior temperature, evaporator outlet air temperature, or refrigerant temperature) and air temperature at the outlet of the evaporator can be controlled to a level at 41°F, or higher.
- (31) “SC03” means the SC03 test cycle as set forth in the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light Duty Trucks, and Medium Duty Vehicles.”
- (32) “Solar Reflective Paint” means a vehicle paint or surface coating which reflects at least 65 percent of the impinging infrared solar energy, as determined using ASTM standards E903-96 (Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres, DOI: 10.1520/E0903-96 (Withdrawn 2005)), E1918-06 (Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field, DOI: 10.1520/E1918-06), or C1549-09 (Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer, DOI: 10.1520/C1549-09). These ASTM standards are incorporated by reference, herein.
- (33) “Solar Roof Panels” means the installation of solar panels on an electric vehicle or a plug-in hybrid electric vehicle such that the solar energy is used to provide energy to the electric drive system of the vehicle by charging the battery or directly providing power to the electric motor with the equivalent of at least 50 Watts of rated electricity output.
- (34) “Strong hybrid gasoline-electric vehicle” means a vehicle that has start/stop capability and regenerative braking capability, where the recaptured braking energy over the Federal Test Procedure is at least 75 percent of the total braking energy, where the percent of recaptured braking energy is measured and calculated according to 40 CFR § 600.108(g).
- (35) “Subconfiguration” means a unique combination within a vehicle configuration of equivalent test weight, road load horsepower, and any other operational characteristics or parameters which is accepted by USEPA.

- (36) "US06" means the US06 test cycle as set forth in the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light Duty Trucks, and Medium Duty Vehicles."
- (37) "Worst-Case" means the vehicle configuration within each test group that is expected to have the highest CO₂-equivalent value, as calculated in section (a)(5).
- (g) Severability.

Each provision of this section is severable, and in the event that any provision of this section is held to be invalid, the remainder of both this section and this article remains in full force and effect.

NOTE: Authority cited: Sections 38550, 38566, 39500, 39600, 39601, 43013, 43018, 43018.5, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43018.5, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106 and 43211, Health and Safety Code.

Title 13, California Code of Regulations

Adopt Section 1962.2.1 of title 13, California Code of Regulations, to read as follows:

§ 1962.2.1 Zero-Emission Vehicle Standards for 2018 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles ~~Electric Vehicle Charging Requirements~~. (Alternative) [1962.3 or 1962.3.1 cover the EV charging requirements]

- (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) [Reserved.]
- (c) [Reserved.]
- (d) [Reserved.]
- (e) [Reserved.]
- (f) [Reserved.]
- (g) [Reserved.]
- (h) Test Procedures.
 - (1) *Determining Compliance.* The certification requirements and test procedures for determining compliance with this section 1962.2.1 are set forth in “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,” amended September 3, 2015 [Insert Date of Adoption], which is incorporated herein by reference. [The test procedures will need to be modified to reflect the changes in 1962.2.1]
 - (2) *NEV Compliance.* The test procedures for determining compliance with subdivision 1962.1(d)(5)(F)1. are set forth in ETA-NTP002 (revision 3) “Implementation of SAE Standard J1666 May 93: Electric Vehicle Acceleration, Gradeability, and Deceleration Test Procedure” (December 1, 2004), and ETA-NTP004 (revision 3) “Electric Vehicle Constant Speed Range Tests” (February 1, 2008), both of which are incorporated by reference herein.

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, 43205 and 43205.5, Health and Safety Code.

Title 13, California Code of Regulations

Adopt Section 1962.3.1 of title 13, California Code of Regulations, to read as follows:

§ 1962.3.1 Electric Vehicle Charging Requirements. (Alternative)

(a) Applicability. This section applies to:

- (1) all battery electric vehicles, range extended battery electric vehicles, except for model year 2006 through 2013 neighborhood electric vehicles, that qualify for ZEV credit under section 1962.1, ~~and 1962.2, or 1962.2.1~~; and
- (2) all hybrid electric vehicles that are capable of being recharged by a battery charger that transfers energy from the electricity grid to the vehicle for purposes of recharging the vehicle traction battery that qualify for ZEV credit under section 1962.1, 1962.2, or 1962.2.1.

(b) Definitions.

- (1) The definitions in section 1962.1, ~~and 1962.2, and 1962.2.1~~ apply to this section.

(c) Requirements.

- (1) Beginning with the 2006 model year, all vehicles identified in subdivision (a) must be equipped with a conductive charger inlet 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 JAN ~~2010~~2024, SAE Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charger Coupler, or SAE J3400 REV SEP 2024, or SAE J3400 SEP 2024, North American Charging System (NACS) for Electric Vehicles, 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 kilowatts, or, sufficient power to enable a complete charge in less than 4 hours. [The current version of J1772 is Jan 2024, and virtually all EVs in the U.S. are now using SAE J3400.]
- (2) A manufacturer may apply to the Executive Officer for approval to use an alternative to the AC inlet described in subdivision (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 subdivision (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 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.

Title 13, California Code of Regulations

Adopt Section 1965.0.1 of title 13, California Code of Regulations, to read as follows:

§ 1965.0.1 Emission Control, Smog Index, and Environmental Performance Labels--1979 and Subsequent Model-Year Motor Vehicles. (Alternative)

In addition to all other requirements, emission control labels are required by the California certification procedures contained in the “California Motor Vehicle Emission Control and Smog Index Label Specifications for 1978 through 2003 Model Year Motorcycles, Light-, Medium- And Heavy-Duty Engines And Vehicles,” adopted March 1, 1978, as last amended September 5, 2003, which is incorporated herein by reference, the “California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” incorporated by reference in § 1961(d), the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” incorporated by reference in § 1961.2(d), the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel-Engines and Vehicles,” incorporated by reference in § 1956.8(b), the “California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric Vehicles, in the Urban Bus and Heavy-Duty Vehicle Classes,” incorporated by reference in § 1956.8(b) and (d), and the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines,” incorporated by reference in § 1956.8(d), and the “California Greenhouse Gas Exhaust Emission Standards and Test Procedures for 2014 and Subsequent Model Heavy-Duty Vehicles,” incorporated by reference in title 17, CCR, section 95663(d).

Smog index labels for passenger cars and light-duty trucks shall conform to the “California Smog Index Label Specifications for 2004 Through 2009 Model Year Passenger Cars and Light-Duty Trucks,” adopted September 5, 2003, as last amended May 2, 2008, which is incorporated herein by reference. Environmental Performance labels for passenger cars, light-duty trucks, and medium-duty passenger vehicles shall conform to the “California Environmental Performance Label Specifications for 2009 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles,” adopted May 2, 2008, as last amended September 2, 2015, which is incorporated herein by reference. Motorcycles shall meet the requirements of Title 40, Code of Federal Regulations, section 86.413-78, as last amended October 28, 1977, which is incorporated herein by reference.

Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018, 43101, 43104, 43105, 43200 and 43200.1, Health and Safety Code. Reference: Sections 39002, 39003, 43000, 43013, 43018.5, 43100, 43101, 43102, 43104, 43107, 43200 and 43200.1, Health and Safety Code.

Title 13, California Code of Regulations

Adopt Section 1969.0.1 of title 13, California Code of Regulations, to read as follows:

§ 1969.0.1 Motor Vehicle Service Information - 1994 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Engines and Vehicles, and 2007 and Subsequent Model Heavy-Duty Engines. (Alternative)

(a) Applicability

- (1) This section shall apply to: (1) all California-certified 1994 and subsequent model-year passenger cars, light-duty trucks and medium-duty engines and vehicles equipped with on-board diagnostic (OBD) systems pursuant to title 13, California Code of Regulations, sections 1968.1 or 1968.2; and (2) all 2007 and subsequent model year California-certified heavy-duty engines equipped with OBD systems pursuant to title 13, California Code of Regulations, sections 1971 or 1971.1. This section shall supersede the provisions of section 1968.1(k)(2.1) at all times that this section is effective and operative. This regulation shall also apply to any passenger cars, light-duty trucks, medium-duty vehicles, and medium- and heavy-duty engines certified to future on-board diagnostic requirements adopted by the Air Resources Board.
- (2) Motor vehicle and engine manufacturers shall comply with amendments made to this section no later than 90 days after such amendments are made effective by the Secretary of State. Copies of any amendments to this section may be obtained upon request to the Chief of the Emissions Certification and Compliance Division at 4001 Iowa Avenue, Riverside, California 92507.

(b) Optional Regulatory Compliance.

- (1) Motor vehicle manufacturers that produce engines for use on heavy-duty vehicles may, for those engines, alternatively comply with all service information and tool provisions of this regulation that are applicable to 1994 and subsequent model year passenger cars, light-duty trucks, and medium-duty engines and vehicles, subject to Executive Officer approval. Implementation dates must comply with the service information provision dates applicable to engine manufacturers.
- (2) Engine manufacturers of diesel-derived engines for use in medium-duty vehicles may, for those engines, alternatively comply with all service information and tool provisions of this regulation that are applicable to 2010 and subsequent model year heavy-duty engines, subject to Executive Officer approval. Implementation dates must comply with the service information provision dates applicable to motor vehicle manufacturers.

- (c) Severability of Provisions. If any provision of this section or its application is held invalid, the remainder of the section and the application of such provision to other persons or circumstances shall not be affected.
- (d) Definitions. The definitions in section 1900(b), Division 3, Chapter 9, Title 13 of the California Code of Regulations, apply with the following additions:
 - (1) “Access codes, recognition codes and encryption” mean any type, strategy, or means of encoding software, information, devices, or equipment that would prevent the access to, use of, or proper function of any emission-related part.
 - (2) “Authorized service network” means a group of independent service and repair facilities that are recognized by motor vehicle manufacturers or engine manufacturers as being capable of performing repairs to factory specifications, including warranty repair work.
 - (3) “Bi-directional control” means the capability of a diagnostic tool to send messages on the data bus (if applicable) that temporarily override a module’s control over a sensor or actuator and give control to the diagnostic tool operator. Bi-directional controls do not create permanent changes to engine or component calibrations.
 - (4) “Covered person” means: (1) any person or entity engaged in the business of service or repair of passenger cars, light-duty trucks, or medium-duty motor vehicles, engines, or transmissions who is licensed or registered with the Bureau of Automotive Repair, pursuant to section 9884.6 of the Business and Professions Code, to conduct that business in California; (2) any person or entity engaged in the business of service or repair of heavy-duty motor vehicles, engines, or transmissions; (3) any commercial business or government entity that repairs or services its own California motor vehicle fleet(s); (4) tool and equipment companies; or (5) any person or entity engaged in the manufacture or remanufacture of emission-related motor vehicle or engine parts for California motor vehicles and motor vehicle engines.
 - (5) “Data stream information” means information that originates within a vehicle or engine by a module or intelligent sensor (including, but not limited to, a sensor that contains and is controlled by its own module) and is transmitted between a network of modules and intelligent sensors connected in parallel with either one or two communications wires. The information is broadcast over communication wires for use by other modules such as chassis or transmission modules to conduct normal vehicle operation or for use by diagnostic tools. Data stream information does not include engine calibration-related information.

- (6) “Days” means calendar days (unless otherwise specified in this section); in computing the time within which a right may be exercised or an act is to be performed, the day of the event from which the designated period runs shall not be included and the last day shall be included, unless the last day falls on a Saturday, Sunday, or a California-recognized holiday observed by the subject motor vehicle manufacturer or engine manufacturer, in which case the last day shall be the following day.
- (7) “Diesel-derived engine” means an engine using a compression ignition thermodynamic cycle and powered by either diesel fuel or alternative fuels such as liquefied petroleum gas or compressed natural gas.
- (8) “Emission-related motor vehicle information” means 1994 and subsequent model year passenger car, light-duty truck, and medium-duty engine and vehicle information regarding any of the following:
 - (A) Any original equipment system, component, or part that controls emissions.
 - (B) Any original equipment system, component, or part associated with the powertrain system including, but not limited to, the fuel system and ignition system.
 - (C) Any original equipment system or component that is likely to impact emissions, including, but not limited to, the transmission system.
- (9) “Emission-related engine information” means 2007 and subsequent model year heavy-duty engine information regarding any of the following:
 - (A) Any original equipment system, component, or part that controls emissions.
 - (B) Any original equipment system, component, or part associated with the engine system including, but not limited to, the fuel system and ignition system. For the purposes of this regulation, if an engine manufacturer elects to have its OBD system monitor inputs received from the transmission, the engine manufacturer is responsible for making relevant transmission system information available pursuant to subsection (e)(2); it shall also make available, beginning with the 2010 model year, and pursuant to subsection (e)(1), all corresponding repair information needed to repair the malfunction and turn off the malfunction indicator light.
- (10) “Emission-related motor vehicle or engine part” means any direct replacement automotive part or any automotive part certified by Executive Order that may affect emissions from a motor vehicle or engine, including replacement parts, consolidated parts, rebuilt parts, remanufactured parts, add-on parts, modified parts and specialty parts.

- (11) "Engine manufacturer," for the purposes of this regulation and unless otherwise noted, means any manufacturer of 2007 and subsequent model year heavy-duty engines equipped with on-board diagnostic systems pursuant to title 13, California Code of Regulations, sections 1971 or 1971.1.
- (12) "Enhanced data stream information" means data stream information that is specific for a motor vehicle manufacturer's or an engine manufacturer's brand of tools and equipment.
- (13) "Enhanced diagnostic, recalibration, and reconfiguration tool" means a proprietary tool developed by or for an engine manufacturer for its engines that can perform emission-related functions including, but not limited to, generic and enhanced tool diagnostic capability, recalibration, and reconfiguration.
- (14) "Enhanced diagnostic tool" means a diagnostic tool that is specific to a motor vehicle manufacturer's vehicles or an engine manufacturer's engines and which can be used for emission-related repair purposes.
- (15) "Fair, reasonable, and nondiscriminatory price", for the purposes of section 1969, means a price that allows a motor vehicle or engine manufacturer to be compensated for the cost of providing required emission-related motor vehicle or engine information and diagnostic tools considering the following:
 - (A) The net cost to the motor vehicle or engine manufacturer's franchised dealerships or authorized service networks, as applicable, for similar information obtained from motor vehicle manufacturers or engine manufacturers, less any discounts, rebates or other incentive programs;
 - (B) The cost to the motor vehicle manufacturer or engine manufacturer, as applicable, for preparing and distributing the information, excluding any research and development costs incurred in designing and implementing, upgrading or altering the onboard computer and its software or any other vehicle part or component. Amortized capital costs for the preparation and distribution of the information may be included;
 - (C) The price charged by other motor vehicle manufacturers or engine manufacturers, as applicable, for similar information;
 - (D) The price charged by the motor vehicle manufacturer or engine manufacturer, as applicable, for similar information immediately prior to the applicability of this section;
 - (E) The ability of an average covered person to afford the information.

- (F) The means by which the information is distributed;
 - (G) The extent to which the information is used, which includes the number of users, and frequency, duration, and volume of use; and
 - (H) Inflation.
- (16) “Generic scan tool” is a tool that can read standardized information pursuant to title 13, California Code of Regulations, sections 1968.1, 1968.2, and/or 1971.1 and that can be used on a number of different engines manufactured by different manufacturers.
 - (17) “Initialization” or “reinitialization” means the process of resetting a vehicle or engine security system by means of an ignition key or access code(s).
 - (18) “Intermediary information repository” means any individual or entity, other than a motor vehicle manufacturer or engine manufacturer, which collects and makes available to covered persons service information and/or information related to the development of emission-related diagnostic tools.
 - (19) “Motor vehicle manufacturer,” for the purposes of this section, means any manufacturer of 1994 and subsequent model year engines or vehicles in the following classes: passenger cars, light-duty trucks, and medium-duty vehicles equipped with on-board diagnostic systems pursuant to title 13, California Code of Regulations, sections 1968.1 or 1968.2.
 - (20) “Nondiscriminatory” as used in the phrase “fair, reasonable, and nondiscriminatory price” means that motor vehicle manufacturers and engine manufacturers shall not set a price for emission-related motor vehicle or engine information or tools that provides franchised dealerships or authorized service networks with an unfair economic advantage over covered persons.
 - (21) “On-board diagnostic system” or “OBD system” for purposes of this section means any system certified to meet the requirements of title 13, California Code of Regulations, sections 1968.1, 1968.2, 1971, 1971.1, or future OBD requirements adopted by the Air Resources Board.
 - (22) A “Reasonable business means” is a method or mode of distribution or delivery of information that is commonly used by businesses or government to distribute or deliver and receive information at a fair, reasonable, and nondiscriminatory price. A reasonable business mean includes, but is not limited to, the Internet, first-class mail, courier services, intermediary information repositories, and fax services.

- (23) "Recalibration" means the process of downloading to an engine's on-board computer emission-related, heavy-duty revisions of on-board computer application software and calibration parameters with default configurations. Recalibration is not dependent on the use of the vehicle identification number (VIN) in determining vehicle configuration.
 - (24) "Reconfiguration" means the process of enabling or adjusting engine features or engine parameters associated with such features to adapt a heavy-duty engine to a particular vehicle and/or application.
- (e)
- (1) Service Information. Except as expressly specified below, motor vehicle manufacturers and engine manufacturers shall respectively make available for purchase to all covered persons all emission-related motor vehicle information and emission-related engine information, as applicable, that is provided to the motor vehicle manufacturer's or engine manufacturer's franchised dealerships or authorized service networks for the engine or vehicle models they have certified in California. Motor vehicle manufacturers and engine manufacturers electing to comply with one of the options of subsection (b) shall make available the emission-related information for the vehicle class for which they opt to comply. The information shall include, but is not limited to, diagnosis, service, and repair information and procedures, technical service bulletins, troubleshooting guides, wiring diagrams, and training materials useful for self-study outside a motor vehicle manufacturer's or engine manufacturer's training classroom. Any motor vehicle manufacturer or engine manufacturer choosing to withhold training materials because it has determined they are not useful for self-study as indicated above shall identify and describe the materials on its website. The motor vehicle manufacturer's or engine manufacturer's determination is subject to Executive Officer review and approval.
 - (2) On-Board Diagnostic System (OBD) Information. Motor vehicle manufacturers and engine manufacturers shall make available for purchase to all covered persons, a general description of each OBD system used in 1996 and subsequent model year passenger cars, light-duty trucks, and medium-duty engines and vehicles, and 2007 and subsequent model year heavy-duty engines, which shall include the following:
 - (A) A general description of the operation of each monitor, including a description of the parameter that is being monitored.
 - (B) A listing of all typical OBD diagnostic trouble codes associated with each monitor.

- (C) A description of the typical enabling conditions for each monitor to execute during vehicle or engine operation, including, but not limited to, minimum and maximum intake air and engine coolant temperature, vehicle speed range, and time after engine startup. Motor vehicle manufacturers and engine manufacturers must also make available all existing monitor-specific OBD drive cycle information for all major OBD monitors as equipped including, but not limited to, catalyst, catalyst heater, oxygen sensor, oxygen sensor heater, evaporative system, exhaust gas recirculation, secondary air, and air conditioning system. As applicable, manufacturers of diesel vehicles or engines must also make available all existing monitor-specific drive cycle information for those engines and vehicles that perform misfire, fuel system, and comprehensive monitoring under specific driving conditions (i.e., non-continuous monitoring).
- (D) A listing of each monitor sequence, execution frequency and typical duration.
- (E) A listing of typical malfunction thresholds for each monitor.
- (F) For OBD parameters for specific vehicles and engines that deviate from the typical parameters, the OBD description shall indicate the deviation and provide a separate listing of the typical values for those vehicles and engines. Subject to Executive Officer approval, manufacturers may consolidate typical value listings into a range of values or another acceptable format if the number of typical parameters is unduly burdensome to list.
- (G) Identification and Scaling Information.
 - 1. For 1994 and subsequent model year passenger cars, light-duty trucks, and medium-duty engines and vehicles, identification and scaling information necessary to interpret and understand data available to a generic scan tool through Service/Mode 6, pursuant to Society of Automotive Engineers (SAE) J1979, "E/E Diagnostic Test Modes - Equivalent to ISO/DIS 15031-5: April 30, 2002," April 2002, which is incorporated by reference in title 13, California Code of Regulations, sections 1968.1 and 1968.2.

2. For 2013 and subsequent model year heavy-duty engines, identification and scaling information necessary to interpret and understand data available through Diagnostic Message 8 pursuant to SAE Recommended Practice J1939-73 or through Service/Mode \$06 pursuant to Society of Automotive Engineers (SAE) J1979, "E/E Diagnostic Test Modes - Equivalent to ISO/DIS 15031-5: April 30, 2002," April 2002, both of which are incorporated by reference in title 13, California Code of Regulations, section 1971.1.
- (H) Except as provided below, the information required by this subsection does not include specific algorithms, specific software code or specific calibration data beyond those required to be made available through the generic scan tool pursuant to the requirements of title 13, California Code of Regulations, sections 1968.1, 1968.2, 1971.1, as applicable, and all future adopted OBD regulations for passenger cars, light-duty trucks, medium-duty engines and vehicles, and heavy-duty engines. Algorithms, software codes, or calibration data that are made available to franchised dealerships or authorized service networks shall be made available for purchase to covered persons. To the extent possible, motor vehicle manufacturers and engine manufacturers shall organize and format the information so that it will not be necessary to divulge specific algorithms, codes, or calibration data considered to be a trade secret by the motor vehicle manufacturer or engine manufacturer.
- (3) On-Board Computer Initialization Procedures.
- (A) Consistent with the requirements of subsection (i) below, motor vehicle manufacturers and engine manufacturers shall make available for purchase to all covered persons computer or anti-theft system initialization information for vehicles or engines so equipped necessary for:
1. The proper installation of on-board computers on motor vehicles or engines that employ integral vehicle security systems; or
 2. The repair or replacement of any other emission-related part.

- (B) Motor vehicle manufacturers and engine manufacturers must make this information available for purchase in a manner that will not require a covered person to purchase enhanced diagnostic tools to perform the initialization. Motor vehicle manufacturers and engine manufacturers may make such information available through, for example, generic aftermarket tools, a pass-through device, or inexpensive manufacturer-specific cables.
- (C) A motor vehicle manufacturer or engine manufacturer may request Executive Officer approval to be excused from the requirements above for some or all model year vehicles or engines, as applicable, through the 2009 model year. The Executive Officer shall approve the request upon finding that the motor vehicle manufacturer or engine manufacturer has demonstrated that:
1. The availability of such information to covered persons would significantly increase the risk of vehicle theft;
 2. A technical and economic need for such a request exists; and
 3. It will make available to covered persons reasonable alternative means to install computers, or to otherwise repair or replace an emission-related part, at a fair, reasonable, and nondiscriminatory price and that such alternative means do not place covered persons, as a class, at a competitive disadvantage to either franchised dealerships or authorized service networks in their ability to service and repair vehicles or engines.
 - a. Any alternative means shall be available to covered persons within 24 hours of the initial request and shall not require the purchase of enhanced diagnostic tools to perform an initialization. Alternatives may include lease of such tools, but only at a fair, reasonable and nondiscriminatory price.
 - b. In lieu of leasing its enhanced diagnostic tools, a motor vehicle manufacturer or engine manufacturer may alternatively make available for purchase to independent equipment and tool companies all data stream information needed to make their diagnostic tools fully functional for initialization purposes. Any motor vehicle manufacturer or engine manufacturer choosing this option must release the information to equipment and tool companies within 60 days of Executive Officer approval.

- (D) All approvals are conditional and subject to audit under subsection (l) below and possible rescission if the conditions set forth in subsection (e)(3)(C) fail to be satisfied.
- (4) The information required by this subsection shall be made available for purchase no later than 180 days after the start of engine or vehicle introduction into commerce or concurrently with its availability to franchised dealerships or authorized service networks, whichever occurs first.
- (f) Internet Availability for Service Information.
 - (1) Information required to be made available for purchase under subsection (e), excluding subsection (e)(3), shall be directly accessible via the Internet. As an exception, motor vehicle manufacturers or engine manufacturers with annual California sales of less than 300 engines or vehicles (based on the average number of California-certified engines or vehicles sold by the motor vehicle manufacturer or engine manufacturer in the three previous consecutive model years) have the option not to provide required materials directly over the Internet. Such motor vehicle manufacturers and engine manufacturers may instead propose an alternative reasonable business means for providing the information required by this section to the Executive Officer for review and approval. The alternate method shall include an Internet website that adequately specifies that the required service information is readily available through other reasonable business means at fair, reasonable, and nondiscriminatory prices. If a motor vehicle manufacturer or engine manufacturer later exceeds the three-year sales average, it would be required to begin complying with all Internet availability requirements the next model year. In such cases, the requirements would apply only to those engine and vehicle models certified in that and subsequent model years and would not apply to any models that were within carry-over test groups that were initially certified before the sales average was exceeded.
 - (2) For purposes of making the information available for purchase via the Internet, motor vehicle manufacturers and engine manufacturers, or their designees, shall establish and maintain an Internet website(s) that:
 - (A) Is accessible at all times, except during times required for routine and emergency maintenance. Routine maintenance shall be scheduled after normal business hours. If the motor vehicle manufacturer's or engine manufacturer's service information website(s) is not available for more than 24 hours for other than routine maintenance, the motor vehicle manufacturer or engine manufacturer, as applicable, shall notify the Executive Officer by either phone or email within one business day.

- (B) Houses all of the required information such that it is available for direct online access (i.e., for online viewing and/or file downloading), except as provided in subsections (e)(3), (f)(2)(G) and (f)(2)(J). In addition to direct online access, motor vehicle manufacturers and engine manufacturers may concurrently offer the information by means of electronic mail, fax transmission, or other reasonable business means.
- (C) Is written in English with all text using readable font sizes.
- (D) Has clearly labeled and descriptive headings or sections, has an online index connected to a search engine and/or hyperlinks that directly take the user to the information, and has a comprehensive search engine that permits users to obtain information by various query terms including, but not limited to, engine, transmission, or vehicle model (as applicable), model year, bulletin number, diagnostic procedure, and trouble code.
- (E) Provides, at a minimum, e-mail access for communication with a designated contact person(s). The contact person(s) shall respond to any inquiries within 2 days of receipt, Monday through Friday. The website shall also provide a business address for the purposes of receiving mail, including overnight or certified mail.
- (F) Lists the most recent updates to the website. Updates must occur concurrently with the availability of new or revised information to franchised dealerships or authorized service networks, whichever occurs first.
- (G) Provides all training materials offered by the motor vehicle manufacturer or engine manufacturer, as applicable, as required under subsection (e)(1). For obtaining any training materials that are not in a format that can be readily downloaded directly from the Internet (e.g., instructional tapes, full-text information associated with bundled software, CD-ROMs, or other media), the website must include information on the type of materials that are available, and how such materials can be purchased.
- (H) Offers media files (if any) and other service information documents in formats that can be viewed with commonly available software programs (e.g., Adobe Acrobat, Microsoft Word, RealPlayer, etc.).
- (I) Provides secure Internet connections (i.e., certificate-based) for transfer of payment and personal information.
- (J) Provides ordering information and instructions for the purchase of tools and information that are required to be made available pursuant to subsections (g) and (h).

- (K) Complies with the following requirements for term, definitions, abbreviations, and acronyms:
1. For 2003 and subsequent model-year passenger cars, light duty trucks, and medium-duty engines and vehicles, complies with the SAE Recommended Practice J1930, "Electrical/Electronic Systems, Diagnostic Terms, Definitions, Abbreviations, and Acronyms - Equivalent to ISO/TR 15031-2: April 30, 2002," April 2002, incorporated by reference herein, for all emission-related motor vehicle information.
 2. For 2010 and later model year heavy-duty engines, emission-related nomenclature shall comply with SAE J2403, "Medium/Heavy-Duty E/E Systems Diagnosis Nomenclature," August 2004, incorporated by reference herein.
- (L) Complies with the following website performance criteria:
1. Possesses sufficient server capacity to allow ready access by all users and has sufficient downloading capacity to assure that all users may obtain needed information without undue delay.
 2. Broken weblinks shall be corrected or deleted weekly.
 3. Website navigation does not require a user to return to the motor vehicle manufacturer's or engine manufacturer's home page or a search engine in order to access a different portion of the site. The use of "one-up" links (i.e., links that connect to related webpages that preceded the one being viewed) is recommended at the bottom of subordinate webpages in order to allow a user to stay within the desired subject matter.
 4. Any manufacturer-specific acronym or abbreviation shall be defined in a glossary webpage which, at a minimum, is hyperlinked by each webpage that uses such acronyms and abbreviations. Motor vehicle manufacturers and engine manufacturers may request Executive Officer approval to use alternate methods to define such acronyms and abbreviations. The Executive Officer shall approve such methods if the motor vehicle manufacturer or engine manufacturer adequately demonstrates that the method provides equivalent or better ease-of-use to the website user.

- (M) Indicates the minimum hardware and software specifications required for satisfactory access to the website(s).
- (3) All information must be maintained by motor vehicle manufacturers and engine manufacturers for a minimum of fifteen years. After such time, the information may be retained in an off-line electronic format (e.g., CD-ROM) and made available for purchase in that format at fair, reasonable, and nondiscriminatory prices upon request. Motor vehicle manufacturers and engine manufacturers shall index their available archived information with a title that adequately describes the contents of the document to which it refers. Motor vehicle manufacturers and engine manufacturers may allow for the ordering of information directly from the website, or from a website hyperlinked to the motor vehicle manufacturer's or engine manufacturer's website. In the alternative, motor vehicle manufacturers and engine manufacturers shall list a phone number and address where covered persons can call or write to obtain requested information through reasonable business means.
- (4) Motor vehicle manufacturers and engine manufacturers must implement fair, reasonable, and nondiscriminatory pricing structures relative to a range of time periods for online access (e.g., in cases where information can be viewed online) and/or the amount of information purchased (e.g., in cases where information becomes viewable after downloading). These pricing structures shall be submitted to the Executive Officer for review concurrently with being posted on the motor vehicle manufacturer's or engine manufacturer's service information website(s).
- (5) Motor vehicle manufacturers and engine manufacturers must provide the Executive Officer with free, unrestricted access to their Internet websites. Access shall include the ability to directly view and download posted service information. The information necessary to access the websites (e.g., user name, password, contact person(s)) must be submitted to the Executive Officer once the websites are operational.

- (6) Reporting Requirements. Motor vehicle manufacturers and engine manufacturers shall provide the Executive Officer with reports that adequately demonstrate that their individual Internet websites meet the requirements of subsection (f)(2). The reports shall also indicate the performance and effectiveness of the websites by using commonly used Internet statistics (e.g., successful requests, frequency of use, number of subscriptions purchased, etc.). Motor vehicle manufacturers and engine manufacturers shall submit such reports annually within 30 days of the end of the calendar year. The Executive Officer may also require motor vehicle manufacturers and engine manufacturers to submit additional reports upon request, including any information required by the United States Environmental Protection Agency under the federal service information regulation. These reports shall be submitted in a format prescribed by the Executive Officer.
- (g) Light-Duty and Medium-Duty Vehicle Diagnostic and Reprogramming Tools and Information.
 - (1) Diagnostic and Reprogramming Tools. Motor vehicle manufacturers shall make available for purchase through reasonable business means to all covered persons, all emission-related enhanced diagnostic tools and reprogramming tools available to franchised dealers, including software and data files used in such equipment. The motor vehicle manufacturer shall ship purchased tools to a requesting covered person as expeditiously as possible after a request has been made.

- (2) Data Stream and Bi-Directional Control Information. Motor vehicle manufacturers shall make available for purchase through reasonable business means, to all equipment and tool companies, all information necessary to read and format all emission-related data stream information, including enhanced data stream information, that is used in diagnostic tools available to franchised dealerships or authorized service networks, and all information that is needed to activate all emission-related bi-directional controls that can be activated by franchised dealership or authorized service network tools. Motor vehicle manufacturers may require, as a condition of sale, that the business agreement contain indemnity or “hold harmless” clauses that relieve the motor vehicle manufacturer from any liability resulting from damage caused by tools produced by the tool and equipment company that is otherwise not attributable to the data provided by the motor vehicle manufacturer. Motor vehicle manufacturers shall make all required information available through the Internet or other reasonable business means to the requesting equipment and tool company within 14 days after the request to purchase has been made, unless the motor vehicle manufacturer petitions the Executive Officer for approval to refuse to disclose such information (“petition for non-disclosure”) to the requesting company or petitions the Executive Officer for additional time to comply (“petition for additional time”). After receipt of a petition and consultation with the affected parties, the Executive Officer shall either grant or refuse the petition based on the evidence submitted during the consultation process:
- (A) If the evidence demonstrates that the motor vehicle manufacturer has a reasonably based belief that the requesting equipment and tool company could not produce safe and functionally accurate tools that would not cause damage to the vehicle, a petition for non-disclosure will be granted.
 - (B) If the evidence demonstrates that the motor vehicle manufacturer does not have a reasonably-based belief that the requesting equipment and tool company could not produce safe and functionally accurate tools that would not cause damage to the vehicle, a petition for non-disclosure will be denied and the motor vehicle manufacturer shall make the requested information available to the requesting equipment and tool company within 2 days of the denial.
 - (C) If the motor vehicle manufacturer submits a petition for additional time, and satisfactorily demonstrates to the Executive Officer that the motor vehicle manufacturer is able to comply but requires additional time within which to do so, the Executive Officer shall grant the petition and provide additional time that is necessary to fully and expeditiously comply. Petitions for additional time shall be considered by the Executive Officer on a case-by-case basis.

- (3) Reprogramming Information.
 - (A) Beginning with the 2004 model year, reprogramming methods used for passenger cars, light-duty trucks, and medium-duty engines and vehicles shall be compatible with SAE J2534-1 Paper, "Recommended Practice for Pass-Thru Vehicle Programming, December 2004, which is incorporated by reference herein, for all vehicle models that can be reprogrammed by franchised dealerships or authorized service networks.
 - (B) Motor vehicle manufacturers shall make available for purchase through reasonable business means to covered persons for vehicle models meeting the requirements of subsection (g)(3)(A) all vehicle reprogramming information and materials necessary to install motor vehicle manufacturers' software and calibration data to the extent that it is provided to franchised dealerships. The motor vehicle manufacturer shall, within 2 days of receipt of a covered person's request, provide purchased reprogramming information via an Internet download or, if available in a different electronic format, via postal mail or package delivery service.
- (4) The information and tools required by this subsection shall be made available for purchase no later than 180 days after the start of vehicle introduction into commerce or concurrently with its availability to franchised dealerships or authorized service networks, whichever occurs first.
- (h) Heavy-Duty Engine Enhanced Diagnostic, Recalibration, and Reconfiguration Tools and Information.
 - (1)

- (A) Engine manufacturers shall continue to make available for purchase through reasonable business means all emission-related diagnostic tools currently available to covered persons, including installation software and data files used in such equipment. Beginning with the 2013 model year, engine manufacturers shall also make available for purchase all emission-related enhanced diagnostic tools, recalibration tools, and reconfiguration tools available to franchised dealerships and authorized service networks, including installation software and data files used in such equipment. The engine manufacturer shall ship purchased tools to a requesting covered person as expeditiously as possible after a request has been made. As a condition for sale and shipment, however, an engine manufacturer may request that the requesting covered persons to take all necessary training offered by the engine manufacturer. Any required training materials and classes must comply with the following conditions:
1. similar training must be required by the engine manufacturer for the use of the same tool by its franchised dealerships and authorized service networks, and the training required for covered persons must be substantially similar to such training in terms of material covered and length of training classes;
 2. the training must be available within six months after a tool request has been made;
 3. the training must be available at a minimum of one California location; and
 4. the training must be made available to the covered person at a fair, reasonable and nondiscriminatory price.
- (B) Recalibration and reconfiguration software, methods, and parameters shall be made available for purchase through reasonable business means to covered persons. Recalibration information and methods shall be compatible with either SAE J2534-1, December 2004, or the Technology and Maintenance Council's (TMC) Recommended Practice RP1210A, "WindowsECommunication API," July 1999, which are incorporated by reference herein.

- (2) Data Stream and Bi-Directional Control Information.

- (A) Beginning with the 2013 model year, engine manufacturers shall make available for purchase through reasonable business means, to all equipment and tool companies, all information necessary to read and format all emission-related data stream information, including enhanced data stream information, that is used in diagnostic tools available to franchised dealerships or authorized service networks, and all information that is needed to activate all emission-related bi-directional controls that can be activated by franchised dealership or authorized service network tools. Engine manufacturers shall make all required information available through the Internet or other reasonable business means to the requesting equipment and tool company within 14 days after the request to purchase has been made, unless the engine manufacturer petitions the Executive Officer for approval to refuse to disclose such information ("petition for non-disclosure") to the requesting company or petitions the Executive Officer for additional time to comply ("petition for additional time"). After receipt of a petition and consultation with the affected parties, the Executive Officer shall either grant or refuse the petition based on the evidence submitted during the consultation process:
1. If the evidence demonstrates that the engine manufacturer has a reasonably based belief that the requesting equipment and tool company could not produce safe and functionally accurate tools that would not cause damage to the engine, the petition for non-disclosure will be granted. Engine manufacturers are not required to provide data stream and bi-directional control information that would permit an equipment and tool company's products to modify a California-certified engine or transmission configuration.
 2. If the evidence does not demonstrate that the engine manufacturer has a reasonably-based belief that the requesting equipment and tool company could not produce safe and functionally accurate tools that would not cause damage to the engine, the petition for non-disclosure will be denied and the engine manufacturer, as applicable, shall make the requested information available to the requesting equipment and tool company within 2 days of the denial.

3. If the engine manufacturer submits a petition for additional time, and satisfactorily demonstrates to the Executive Officer that the motor vehicle manufacturer is able to comply but requires additional time within which to do so, the Executive Officer shall grant the petition and provide additional time to fully and expeditiously comply. Petitions for additional time shall be considered by the Executive Officer on a case-by-case basis.
- (B) Engine manufacturers may require that tools using information covered under subsection (h)(2)(A) comply with the Component Identifier message specified in SAE J1939-71, dated December 2003, as Parameter Group Number (PGN) 65249 (including the message parameter's make, model, and serial number) and the SAE J1939-81, dated May 2003, Address Claim PGN.
- (C) An engine manufacturer may require, as a condition of sale of its tools, that the business agreement contain indemnity or "hold harmless" clauses that relieve the engine manufacturer from any liability resulting from damage caused by tools produced by the tool and equipment company that is otherwise not attributable to the data provided by the engine manufacturer.
- (3) The information and tools required by this subsection shall be made available for purchase no later than 180 days after the start of engine introduction into commerce or concurrently with its availability to franchised dealerships or authorized service networks, whichever occurs first.
- (i) Costs: All information and tools required to be provided to covered persons by this regulation shall be made available for purchase at a fair, reasonable, and nondiscriminatory prices.
- (j) Motor vehicle manufacturers and engine manufacturers shall not utilize any access code, recognition code or encryption for the purpose of preventing a vehicle or engine owner from using an emission-related motor vehicle or engine part (with the exception of the powertrain control module, engine control modules and transmission control modules, as applicable), that has not been manufactured by that motor vehicle manufacturer or engine manufacturer or any of its original equipment suppliers.
- (k) Trade Secrets: Motor vehicle manufacturers and engine manufacturers may withhold trade secret information (as defined in the Uniform Trade Secret Act contained in Title 5 of the California Civil Code) which otherwise must be made available for purchase, subject to the following:

- (1) At the time of initial posting of all information required to be provided under subsections (e) through (h) above, a motor vehicle manufacturer or engine manufacturer shall identify, by brief description on its Internet website, any information that it believes to be a trade secret and not subject to disclosure.
- (2) A covered person, believing that a motor vehicle manufacturer or engine manufacturer has not fully provided all information that is required to be provided under subsections (e) through (h) above shall submit a request in writing by certified mail to the motor vehicle manufacturer for release of the information.
- (3) Upon receipt of the request for information, a motor vehicle manufacturer or engine manufacturer shall do the following:
 - (A) If it had not previously made the information available for purchase because of an oversight, it shall make the information available within 2 days from receipt of the request directly to the requesting covered person at a fair, reasonable, and nondiscriminatory price and by reasonable business means. Additionally, the motor vehicle manufacturer or engine manufacturer shall, within 7 days, make such information available for purchase to other covered persons consistent with the requirements of this regulation.
 - (B) If it has not made the requested information available for purchase because it believes the information to be a trade secret, it shall within 14 days, notify the requesting covered person that it considers the information to be a trade secret, provide justification in support of its position, and make reasonable efforts to see if the matter can be resolved informally.
 - (C) If during this 14 day period set forth in subsection (k)(3)(B), the motor vehicle manufacturer or engine manufacturer determines that the information is, in fact, not a trade secret, it shall immediately notify the requesting covered person of its determination and make the information available within the timeframes and means set forth in subsection (k)(3)(A)
 - (D) If the parties can informally resolve the matter, the motor vehicle manufacturer or engine manufacturer shall within 2 days provide the requesting covered person with all of the information that is subject to disclosure consistent with that agreement. The motor vehicle manufacturer or engine manufacturer shall also, within 7 days, make such information available for purchase to other covered persons consistent with the requirements of this regulation.

- (E) If the matter cannot be informally resolved, the motor vehicle manufacturer or engine manufacturer shall, within 30 days from the date that it notified the requesting covered person that it considers the information to be a trade secret, or such longer period the parties may mutually agree upon, petition the California superior court for declaratory relief to make a finding that the information is exempt from disclosure because it is a trade secret. The petition shall be filed in accordance with the California Code of Civil Procedure section 395 et seq. The petition shall be accompanied with a declaration stating facts that show that the motor vehicle manufacturer or engine manufacturer has made a reasonable and good faith attempt to informally resolve the matter.
- (I) Executive Officer Review of Compliance.
 - (A) The Executive Officer shall monitor compliance with the requirements of Health and Safety Code section 43105.5 and this regulation.
 - (2) The Executive Officer, through the Chief of the Mobile Source Operations Division (Division Chief), shall periodically audit a motor vehicle manufacturer's or engine manufacturer's Internet website(s) and other distribution sources to determine whether the information requirements of Health and Safety Code section 43105.5 and this regulation are being fulfilled. Motor vehicle manufacturers and engine manufacturers must provide the Executive Officer with free unrestricted access to the sites and other sources for the purposes of an audit.
 - (3) The Division Chief shall also commence an audit upon receipt of a request from a covered person that provides reasonable cause to believe that a motor vehicle manufacturer or engine manufacturer is not in compliance.
 - (A) Such a request shall be in the form of a written declaration setting forth specific details of the alleged noncompliance of the motor vehicle manufacturer or engine manufacturer. The declaration shall also set forth facts that demonstrate that the requesting covered person has undertaken efforts to resolve the matter informally with the named motor vehicle manufacturer or engine manufacturer.
 - (B) The covered person shall concurrently provide a copy of the audit request on the motor vehicle manufacturer or engine manufacturer against whom the request has been filed.

- (C) The Division Chief shall determine if the request, on its face, sets forth facts establishing reasonable cause to believe that that motor vehicle manufacturer or engine manufacturer is in noncompliance with Health and Safety Code section 43105.5 or this regulation and that the covered person has undertaken reasonable efforts to informally resolve the alleged noncompliance with the motor vehicle manufacturer or engine manufacturer directly. If the Division Chief determines that the request satisfies these conditions, he or she shall conduct an audit of the designated motor vehicle manufacturer's or engine manufacturer's Internet website. Otherwise, the Division Chief shall dismiss the request and notify the requesting covered person and the affected motor vehicle manufacturer or engine manufacturer of his or her determination.
- (4) In conducting any audit, the Division Chief may require the motor vehicle manufacturer or engine manufacturer to provide the ARB with all information and materials related to compliance with the requirements of Health and Safety Code section 43105.5 and this regulation, including but not limited to:
 - (A) Copies of all books, records, correspondence or documents in its possession or under its control that the motor vehicle manufacturer or engine manufacturer is required to provide to persons engaged in the service and repair industries and to equipment and tool companies under subsections (d) through (h) of this regulation, and
 - (B) Any and all reports or records developed or compiled either for or by the motor vehicle manufacturer or engine manufacturer to monitor performance of its Internet site(s).
- (5) In conducting the audit, the Division Chief may order or subpoena the motor vehicle manufacturer or engine manufacturer, the party filing the request for inspection, or any other person with possible knowledge of the issue of noncompliance to appear in person and testify under oath. The Division Chief may also request or subpoena such persons to provide any additional information that the Division Chief deems necessary to determine any issue of noncompliance.
- (6) Except for good cause, the audit shall be completed within 60 days from the date that the Division Chief notifies the motor vehicle manufacturer or engine manufacturer about the audit. At the conclusion of the audit, the Division Chief shall issue a written determination, with supporting findings, regarding compliance by the motor vehicle manufacturer or engine manufacturer.

- (7) If the Division Chief finds sufficient credible evidence that the motor vehicle manufacturer or engine manufacturer is not in compliance with any requirements of Health and Safety Code section 43105.5 or this regulation, the determination shall be in the form of a notice to comply against the motor vehicle manufacturer or engine manufacturer.
- (8) The Division Chief's determination not to issue a notice to comply against a motor vehicle manufacturer or engine manufacturer is subject to limited review by the Executive Officer.
 - (A) A covered person may only request that the Executive Officer review a determination that it specifically requested pursuant to subsection (1)(3) above.
 - (B) The covered person shall file the request for Executive Officer review within 10 days from the date of issuance of the Division Chief's determination.
 - 1. The request shall be filed to the attention of the Executive Officer c/o Clerk of the Board, Air Resources Board, P.O. Box 2815, Sacramento, CA 95812-2815. A copy of the request shall be concurrently served on the motor vehicle manufacturer that was the subject of the audit and determination.
 - 2. The request shall set forth specific facts and reasons why the determination should be reviewed and supporting legal authority for why a notice to comply should have been issued.
 - (C) The motor vehicle manufacturer or engine manufacturer may file an opposition to the request for review within 10 days from the date of service of the request for review.
 - (D) The Executive Officer shall issue a determination within 30 days from the last day that the motor vehicle manufacturer or engine manufacturer had to file an opposition. The Executive Officer may affirm the decision of the Division Chief; remand the matter back to the Division Chief for further consideration or evidence; or issue a notice to comply against the motor vehicle manufacturer or engine manufacturer.
- (9) Within 30 days from the date of issuance of a notice to comply, the motor vehicle manufacturer or engine manufacturer shall either:

- (A) Submit to the Executive Officer a compliance plan that adequately demonstrates that the motor vehicle manufacturer or engine manufacturer will come into compliance with this section within 45 days from the date of submission of the plan, or such longer period that the Executive Officer deems appropriate to allow the motor vehicle manufacturer or engine manufacturer to properly remedy the noncompliance; or
 - (B) Request an administrative hearing to consider the basis or scope of the notice to comply.
 - (10) If the motor vehicle manufacturer or engine manufacturer elects to submit a compliance plan, the Executive Officer shall review the plan and issue a written determination, within 30 days, either accepting or rejecting the plan. The Executive Officer shall reject the compliance plan if the Executive Officer finds that it will not bring the motor vehicle manufacturer or engine manufacturer into compliance within 45 days from the date that the plan would have been approved, or such longer period that the Executive Officer deemed appropriate to allow the motor vehicle manufacturer or engine manufacturer to properly remedy the noncompliance. The Executive Officer shall notify the motor vehicle manufacturer or engine manufacturer in writing of his or her determination, and that the Executive Officer will be seeking administrative review pursuant to subsection (m) below.
 - (11) After approving a proposed compliance plan, if the Executive Officer determines that the motor vehicle manufacturer or engine manufacturer has failed to comply with the terms of the plan, the Executive Officer shall notify the motor vehicle manufacturer or engine manufacturer of his or her determination and that he or she will be seeking administrative review pursuant to subsection (m) below.
- (m) Administrative Hearing Review.
- (1) A motor vehicle manufacturer or engine manufacturer may request that a hearing officer review the basis and scope of the notice to comply. Failure by the motor vehicle manufacturer or engine manufacturer to request such a review and failing, in the alternative, to submit a compliance plan as required by subsection (l)(9)(A) shall result in the Executive Officer's determination becoming final and may subject the motor vehicle manufacturer or engine manufacturer to penalties pursuant to Health and Safety Code section 43105.5(f) and subsection (l).
 - (2) The Executive Officer shall forward the following matters to a hearing officer for appropriate administrative review, including, if warranted, consideration of penalties:

- (A) A compliance plan that it has rejected pursuant to subsection (l)(10).
 - (B) A notice to comply that has been issued against a motor vehicle manufacturer or engine manufacturer who has failed to either request administrative review of the Executive Officer determination, or, in the alternative, to submit a compliance plan.
 - (C) An Executive Officer determination that a motor vehicle manufacturer or engine manufacturer has failed to satisfy the terms of a compliance plan it has submitted in response to a notice to comply.
- (3) Administrative hearings under this regulation shall be conducted pursuant to the procedures set forth in title 17, California Code of Regulations, section 60060.1 et seq.
- (n) Penalties.
- (1) If after an administrative hearing, the hearing officer finds that the motor vehicle manufacturer or engine manufacturer has failed to comply with any of the requirements of this section, and the motor vehicle manufacturer or engine manufacturer fails to correct the violation within 30 days from the date of his finding, the hearing officer may impose a civil penalty upon the motor vehicle manufacturer or engine manufacturer in an amount not to exceed \$25,000 per day (including Saturdays, Sundays, and observed holidays) per violation until the violation is corrected. The hearing officer may immediately impose a civil penalty in cases where a motor vehicle manufacturer or engine manufacturer has failed to act in accordance with a compliance plan it has previously submitted.
 - (2) For purposes of this section, a finding by a hearing officer that a motor vehicle manufacturer or engine manufacturer has failed to comply with the requirements of Health and Safety Code section 43105.5 and title 13, California Code of Regulations, section 1969 et seq., including the failure to submit a timely compliance plan, shall be considered a single violation.

Note: Authority cited: Sections 39600, 39601, 43000.5, 43018, 43105.5 and 43700, Health and Safety Code. Reference: Sections 39027.3, 43104 and 43105.5, Health and Safety Code.

Title 13, California Code of Regulations

Adopt Section 1976.0.1 of title 13, California Code of Regulations, to read as follows:

§ 1976.0.1 Standards and Test Procedures for Motor Vehicle Fuel Evaporative Emissions. (Alternative)

- (a) Fuel evaporative emissions from 1970 through 1977 model passenger cars and light-duty trucks are set forth in Title 40, Code of Federal Regulations, Part 86, Subparts A and C, as it existed on June 20, 1973. These standards are enforced in California pursuant to section 43008 of the Health and Safety Code.
- (b) (1) Evaporative emissions for 1978 and subsequent model gasoline fueled, 1983 and subsequent model liquefied petroleum gas fueled, and 1993 and subsequent model alcohol fueled motor vehicles and hybrid electric vehicles subject to exhaust emission standards under this article, except petroleum fueled diesel vehicles, compressed natural gas fueled vehicles, hybrid electric vehicles that have sealed fuel systems which can be demonstrated to have no evaporative emissions, and motorcycles, shall not exceed the following standards:
- (A) For vehicles identified below, tested in accordance with the test procedure based on the Sealed Housing for Evaporative Determination as set forth in Title 40, Code of Federal Regulations, sections 86.130-78 through 86.143-90 as they existed July 1, 1989, the evaporative emission standards are:

<i>Vehicle Type</i>	<i>Model Year</i>	<i>Hydrocarbons⁽¹⁾ Diurnal + Hot Soak (grams/test) 50K miles</i>
Passenger cars	1978 and 1979	6.0
Light-duty trucks		6.0
Medium-duty vehicles		6.0
Heavy-duty vehicles		6.0
Passenger cars	1980-1994 ⁽²⁾	2.0
Light-duty trucks		2.0
Medium-duty vehicles		2.0
Heavy-duty vehicles		2.0

- (B) For the vehicles identified below, tested in accordance with the test procedure which includes the running loss test, the hot soak test, and the 72 hour diurnal test, the evaporative emission standards are:

<i>Vehicle Type</i>	<i>Model Year</i>	<i>Hydrocarbons⁽¹⁾</i>	
		<i>Three-Day Diurnal +Hot Soak (grams/test) Useful Life⁽²⁾</i>	<i>Running Loss (grams/mile) Useful Life ⁽²⁾</i>
Passenger cars	1995 through 2005 ⁽³⁾	2.0	0.05
Light-duty trucks		2.0	0.05
Medium-duty vehicles (6,001-8,500 lbs. GVWR)			
with fuel tanks < 30 gallons		2.0	0.05
with fuel tanks ≥ 30 gallons		2.5	0.05
(8,501-14,000 lbs. GVWR) ⁽⁴⁾		3.0	0.05
Heavy-duty vehicles (over 14,000 lbs. GVWR)	1993 through 2005 ⁽⁵⁾	2.0	0.05
Hybrid electric passenger cars		2.0	0.05
Hybrid electric light-duty trucks		2.0	0.05
Hybrid electric medium-duty vehicles		2.0	0.05

¹ Organic Material Hydrocarbon Equivalent, for alcohol-fueled vehicles.

² For purposes of this paragraph, “useful life” shall have the same meaning as provided in section 2112, Title 13, California Code of Regulations. Approval of vehicles which are not exhaust emission tested using a chassis dynamometer pursuant to section 1960.1 or 1961, Title 13, California Code of Regulations shall be based on an engineering evaluation of the system and data submitted by the applicant.

³ The running loss and useful life three-day diurnal plus hot soak evaporative emission standards (hereinafter “running loss and useful life standards”) shall be phased in beginning with the 1995 model year. Each manufacturer, except ultra-small volume and small volume manufacturers, shall certify the specified percent (a) of passenger cars and (b) of light-duty trucks, medium-duty vehicles and heavy-duty vehicles to the running loss and useful life standards according to the following schedule:

<i>Model Year</i>	<i>Minimum Percentage of Vehicles Certified to Running Loss and Useful Life Standards*</i>
1995	10 percent
1996	30 percent
1997	50 percent

* The minimum percentage of motor vehicles of each vehicle type required to be certified to the running loss and useful life standards shall be based on the manufacturer's projected California model-year sales (a) of passenger cars and (b) of light-duty trucks, medium-duty vehicles and heavy-duty vehicles. Optionally, the percentage of motor vehicles can also be based on the manufacturer's projected California model-year sales (a) of passenger cars and light-duty trucks and (b) of medium-duty vehicles and heavy-duty vehicles.

Beginning with the 1998 model year, all motor vehicles subject to the running loss and useful life standards, except those produced by ultra-small volume manufacturers, shall be certified to the specified standards. In the 1999 through 2005 model years, all motor vehicles subject to the running loss and useful life standards, including those produced by ultra-small volume manufacturers, shall be certified to the specified standards.

All 1995 through 1998 model-year motor vehicles which are not subject to running loss and useful life standards pursuant to the phase-in schedule shall comply with the 50,000-mile standards in effect for 1980 through 1994 model-year vehicles.

⁴ For the 1995 model year only, the evaporative emission standards for complete vehicles in this weight range shall be 2.0 grams/test and compliance with the evaporative emission standards shall be based on the SHED conducted in accordance with the procedures set forth in Title 40, Code of Federal Regulations, sections 86.130-78 through 86.143-90 as they existed July 1, 1989. For the 1995 through 2005 model years, the evaporative emission standards for incomplete vehicles in this weight range shall be 2.0 grams/test and compliance with the evaporative emission standards shall be based on the test procedures specified in paragraph 4.g. of the "California Evaporative Emission Standards and Test Procedures for 1978 and Subsequent Model Motor Vehicles."

⁵ The running loss and useful life standards for all hybrid electric vehicles shall be effective beginning in the 1993 model year.

- (C) For vehicles identified below, tested in accordance with the test procedure which includes the hot soak test and the 48 hour diurnal test, the evaporative emission standards are:

Vehicle Type	Model Year	Hydrocarbons¹ Two-Day Diurnal + Hot Soak (grams/test) Useful Life²
Passenger cars	1996 through	2.5
Light-duty trucks	2005 ³	2.5
Medium-duty vehicles		
(6,001-8,500 lbs. GVWR)		
with fuel tanks < 30 gallons		2.5
with fuel tanks ≥ 30 gallons		3.0
(8,501-14,000 lbs. GVWR)		3.5
Heavy-duty vehicles (over 14,000 lbs. GVWR)		4.5
Hybrid electric passenger cars	1996 through	2.5
Hybrid electric light-duty trucks	2005 ³	2.5
Hybrid electric medium-duty vehicles		2.5

¹ Organic Material Hydrocarbon Equivalent for alcohol-fueled vehicles.

2 For purposes of this paragraph, “useful life” shall have the same meaning as provided in section 2112, Title 13, California Code of Regulations. Approval of vehicles which are not exhaust emission tested using a chassis dynamometer pursuant to section 1960.1 or 1961, Title 13, California Code of Regulations shall be based on an engineering evaluation of the system and data submitted by the applicant.

3 The two-day diurnal plus hot soak evaporative emission standards (hereinafter “supplemental standards”) shall be phased-in beginning with the 1996 model year. Those vehicles certified under the running loss and useful life standards for the 1996 through 2005 model years must also be certified under the supplemental standards.

- (D) Zero-emission vehicles shall produce zero fuel evaporative emissions under any and all possible operational modes and conditions.
- (E) For 2001 through 2014 model year vehicles, the optional zero-fuel evaporative emission standards for the three-day and two-day diurnal-plus-hot-soak tests are 0.35 grams per test for passenger cars, 0.50 grams per test for light-duty trucks 6,000 lbs. GVWR and under, and 0.75 grams per test for light-duty trucks from 6,001 to 8,500 lbs. GVWR, to account for vehicle non-fuel evaporative emissions (resulting from paints, upholstery, tires, and other vehicle sources). Vehicles demonstrating compliance with these evaporative emission standards shall also have zero (0.0) grams of fuel evaporative emissions per test for the three-day and two-day diurnal-plus-hot-soak tests. The “useful life” shall be 15 years or 150,000 miles, whichever occurs first. In lieu of demonstrating compliance with the zero (0.0) grams of fuel evaporative emissions per test over the three-day and two-day diurnal-plus-hot-soak tests, the manufacturer may submit for advance Executive Officer approval a test plan to demonstrate that the vehicle has zero (0.0) grams of fuel evaporative emissions throughout its useful life.

Additionally, in the case of a SULEV vehicle for which a manufacturer is seeking a partial ZEV credit, the manufacturer may prior to certification elect to have measured fuel evaporative emissions reduced by a specified value in all certification and in-use testing of the vehicle as long as measured mass exhaust emissions of NMOG for the vehicle are increased in all certification and in-use testing. The measured fuel evaporative emissions shall be reduced in increments of 0.1 gram per test, and the measured mass exhaust emissions of NMOG from the vehicle shall be increased by a gram per mile factor, to be determined by the Executive Officer, for every 0.1 gram per test by which the measured fuel evaporative emissions are reduced. For the purpose of this calculation, the evaporative emissions shall be measured, in grams per test, to a minimum of three significant figures.

- (F) For the 2004 through 2014 model motor vehicles identified below, tested in accordance with the test procedures described in Title 40, Code of Federal Regulations, sections 86.130-78 through 86.143-90 as they existed July 1, 1989 and as modified by the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles” incorporated by reference in section 1976(c), the evaporative emission standards are:

Vehicle Type	Hydrocarbon¹ Standards^{2 3 4}		
	Running Loss (grams per mile)	Three Day Diurnal + Hot Soak (grams per test)	Two-Day Diurnal + Hot Soak (grams per test)
Passenger cars	0.05	0.50	0.65
Light-duty trucks (under 8,501 lbs. GVWR)			
6,000 lbs. GVWR and under	0.05	0.65	0.85
6,001-8,500 lbs. GVWR	0.05	0.90	1.15
Medium-duty vehicles (8,501-14,000 lbs. GVWR)	0.05	1.00	1.25
Heavy-duty vehicles (over 14,000 lbs. GVWR)	0.05	1.00	1.25

¹ Organic Material Hydrocarbon Equivalent for alcohol-fueled vehicles.

² For all vehicles certified to these standards, the “useful life” shall be 15 years or 150,000 miles, whichever first occurs. Approval of vehicles which are not exhaust emission tested using a chassis dynamometer pursuant to section 1960.1 or 1961, title 13, California Code of Regulations shall be based on an engineering evaluation of the system and data submitted by the applicant.

³ (a) These evaporative emission standards shall be phased-in beginning with the 2004 model year. Each manufacturer, except small volume manufacturers, shall certify at a minimum the specified percentage of its vehicle fleet to the evaporative emission standards in this table or the optional zero-evaporative emission standards in section 1976(b)(1)(E) according to the schedule set forth below. For purposes of this paragraph (a), each manufacturer's vehicle fleet consists of the total projected California sales of the manufacturer's gasoline-fueled, liquefied petroleum-fueled and alcohol-fueled passenger cars, light-duty trucks, medium-duty vehicles, and heavy-duty vehicles.

Model Year	Minimum Percentage of Vehicles Certified to the Standards in §§ 1976(b)(1)(F) and (b)(1)(E)
2004	40
2005	80

2006 and subsequent	100

A small volume manufacturer shall certify 100 percent of its 2006 and subsequent model vehicle fleet to the evaporative emission standards in the table or the optional zero-evaporative emission standards in section 1976(b)(1)(E).

All 2004 through 2005 model-year motor vehicles which are not subject to these standards or the standards in section 1976(b)(1)(E) pursuant to the phase-in schedule shall comply with the requirements of sections 1976(b)(1)(B) and (C).

(b) A manufacturer may use an "Alternative or Equivalent Phase-in Schedule" to comply with the phase-in requirements. An "Alternative Phase-in" is one that achieves at least equivalent emission reductions by the end of the last model year of the scheduled phase-in. Model-year emission reductions shall be calculated by multiplying the percent of vehicles (based on the manufacturer's projected California sales volume of the applicable vehicle fleet) meeting the new requirements per model year by the number of model years implemented prior to and including the last model year of the scheduled phase-in. The "cumulative total" is the summation of the model-year emission reductions (e.g., the three model-year 40/80/100 percent phase-in schedule would be calculated as: $(40\% \times 3 \text{ years}) + (80\% \times 2 \text{ years}) + (100\% \times 1 \text{ year}) = 380$). The required cumulative total for the phase-in of these standards is 380 emission reductions. Any alternative phase-in that results in an equal or larger cumulative total than the required cumulative total by the end of the last model year of the scheduled phase-in shall be considered acceptable by the Executive Officer only if all vehicles subject to the phase-in comply with the respective requirements in the last model year of the required phase-in schedule. A manufacturer shall be allowed to include vehicles introduced before the first model year of the scheduled phase-in (e.g., in the previous example, 10 percent introduced one year before the scheduled phase-in begins would be calculated as: $(10\% \times 4 \text{ years}) = 40$) and added to the cumulative total.

(c) These evaporative emission standards do not apply to zero-emission vehicles.

⁴ In-use compliance whole vehicle testing shall not begin until the motor vehicle is at least one year from the production date and has accumulated a minimum of 10,000 miles. For vehicles introduced prior to the 2007 model year, in-use compliance standards of 1.75 times the "Three-Day Diurnal + Hot-Soak" and "Two-Day Diurnal + Hot-Soak" gram per test standards shall apply for only the first three model years of an evaporative family certified to a new standard.

(G) For 2015 and subsequent model motor vehicles, the following evaporative emission requirements apply:

1. A manufacturer must certify all vehicles subject to this section to the emission standards specified in either Option 1 or Option 2 below.
 - a. *Option 1.* The evaporative emissions from 2015 and subsequent model motor vehicles, tested in accordance with the test procedure sequence described in the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," incorporated by reference in section 1976(c), shall not exceed:

Vehicle Type	Hydrocarbon⁽¹⁾ Emission Standards⁽²⁾		
	Running Loss (grams per mile)	Three-Day Diurnal + Hot Soak and Two-Day Diurnal + Hot Soak	
		Whole Vehicle (grams per test)	Fuel Only⁽³⁾ (grams per test)
Passenger cars	0.05	0.350	0.0
Light-duty trucks 6,000 lbs. GVWR and under	0.05	0.500	0.0
Light-duty trucks 6,001-8,500 lbs. GVWR	0.05	0.750	0.0
Medium-duty passenger vehicles	0.05	0.750	0.0
Medium-duty vehicles (8,501-14,000 lbs. GVWR)	0.05	0.750	0.0
Heavy-duty vehicles (over 14,000 lbs. GVWR)	0.05	0.750	0.0

¹ Organic Material Hydrocarbon Equivalent for alcohol-fueled vehicles.

² For all vehicles certified to these standards, the “useful life” shall be 15 years or 150,000 miles, whichever occurs first. Approval of vehicles that are not exhaust emission tested using a chassis dynamometer pursuant to section 1961, title 13, California Code of Regulations shall be based on an engineering evaluation of the system and data submitted by the applicant.

- b. ³ In lieu of demonstrating compliance with the fuel-only
- b. emission standard (0.0 grams per test) over the three-day
- b. and two-day diurnal plus hot soak tests, a manufacturer
- b. may, with advance Executive Officer approval,
- b. demonstrate compliance through an alternate test
- b. plan. *Option 2.* The evaporative emissions from 2015
- and subsequent model motor vehicles, tested in
- accordance with the test procedure sequence
- described in the “California Evaporative Emission
- Standards and Test Procedures for 2001 and
- Subsequent Model Motor Vehicles,” incorporated by
- reference in section 1976(c), shall not exceed:

Vehicle Type	Hydrocarbon⁽¹⁾ Emission Standards⁽²⁾		
	Running Loss (grams per mile)	Highest Whole Vehicle Diurnal + Hot Soak⁽³⁾⁽⁴⁾⁽⁵⁾ (grams per test)	Canister Bleed⁽⁶⁾ (grams per test)
Passenger cars; and Light-duty trucks 6,000 lbs. GVWR and under, and 0-3,750 lbs. LVW	0.05	0.300	0.020

Light-duty trucks 6,000 lbs. GVWR and under, and 3,751-5,750 lbs. LVW	0.05	0.400	0.020
Light-duty trucks 6,001-8,500 lbs. GVWR; and Medium-duty passenger vehicles	0.05	0.500	0.020
Medium-duty vehicles (8,501-14,000 lbs. GVWR); and Heavy-duty vehicles (over 14,000 lbs. GVWR)	0.05	0.600	0.030

¹ Organic Material Hydrocarbon Equivalent for alcohol-fueled vehicles.

² Except as provided below, for all vehicles certified to these standards, the “useful life” shall be 15 years or 150,000 miles, whichever occurs first. For 2016 and previous model vehicles, 2017 and previous model vehicles >6,000 lbs. GVWR, and 2021 and previous model vehicles certified by a small volume manufacturer, the canister bleed standards are certification standards only. Manufacturers are not required to establish deterioration factors for canister bleed emissions. Approval of vehicles that are not exhaust emission tested using a chassis dynamometer pursuant to section 1961, title 13, California Code of Regulations shall be based on an engineering evaluation of the system and data submitted by the applicant.

³ The manufacturer shall determine compliance by selecting the highest whole vehicle diurnal plus hot soak emission value of the Three-Day Diurnal Plus Hot Soak Test and of the Two-Day Diurnal Plus Hot Soak Test.

⁴ *Fleet-Average Option for the Highest Whole Vehicle Diurnal Plus Hot Soak Emission Standard Within Each Emission Standard Category.* A manufacturer may optionally comply with the highest whole vehicle diurnal plus hot soak emission standards by using fleet-average hydrocarbon emission values. To participate, a manufacturer must utilize the fleet-average option for all of its emission standard categories and calculate a separate fleet-average hydrocarbon emission value for each emission standard category. The emission standard categories are as follows: (1) passenger cars and light-duty trucks 6,000 pounds GVWR and under, and 0-3,750 pounds LVW; (2) light-duty trucks 6,000 pounds GVWR and under, and 3,751-5,750 pounds LVW; (3) light-duty trucks 6,001-8,500 pounds GVWR and medium-duty passenger vehicles; and (4) medium-duty and heavy-duty vehicles. The fleet-average hydrocarbon emission value for each emission standard category shall be calculated as follows:

$$\frac{\sum_{i=1}^n [(\text{number of vehicles in the evaporative family})_i \times (\text{family emission limit})_i]}{\sum_{i=1}^n (\text{number of vehicles in the evaporative family})_i}$$

where “n” = a manufacturer's total number of Option 2 certification evaporative families within an emission standard category for a given model year;

“number of vehicles in the evaporative family” = the number of vehicles produced and delivered for sale in California in the evaporative family;

“family emission limit” = the numerical value selected by the manufacturer for the evaporative family that serves as the emission standard for the evaporative family with respect to all testing, instead of the emission standard specified in this section 1976.0.1 (b)(1)(G)1.b. The family emission limit shall not exceed 0.500 grams per test for passenger cars; 0.650 grams per test for light duty trucks 6,000 pounds GVWR and under; 0.900 grams per test for light-duty trucks 6,001-8,500 pounds GVWR; and 1.000 grams for medium-duty passenger vehicles, medium-duty vehicles, and heavy-duty vehicles. In addition, the family emission limit shall be set in increments of 0.025 grams per test.

⁵ *Calculation of Hydrocarbon Credits or Debits for the Fleet-Average Option.*

(1) *Calculation of Hydrocarbon Credits or Debits.* For each emission standard category in the model year, a manufacturer shall calculate the hydrocarbon credits or debits, as follows:

$$[(\text{Applicable Hydrocarbon Emission Standard for the Emission Standard Category}) - (\text{Manufacturer's Fleet-Average Hydrocarbon Emission Value for the Emission Standard Category})] \times (\text{Total Number of Affected Vehicles})$$

where “Total Number of Affected Vehicles” = the total number of vehicles in the evaporative families participating in the fleet-average option, which are produced and delivered for sale in California, for the emission standard category of the given model year.

A negative number constitutes hydrocarbon debits, and a positive number constitutes hydrocarbon credits accrued by the manufacturer for the given model year. Hydrocarbon credits earned in a given model year shall retain full value through the fifth model year after they are earned. At the beginning of the sixth model year, the hydrocarbon credits will have no value.

(2) *Procedure for Offsetting Hydrocarbon Debits.* A manufacturer shall offset hydrocarbon debits with hydrocarbon credits for each emission standard category within three model years after the debits have been incurred. If total hydrocarbon debits are not equalized within three model years after they have been incurred, the manufacturer shall be subject to the Health and Safety Code section 43211 civil penalties applicable to a manufacturer which sells a new motor vehicle that does not meet the applicable emission standards adopted by the state board. The cause of action shall be deemed to accrue when the hydrocarbon debits are not equalized by the end of the specified time period. For the purposes of Health and Safety Code section 43211, the number of vehicles not meeting the state board's emission standards shall be determined by dividing the total amount of hydrocarbon debits for the model year in the emission standard category by the applicable hydrocarbon emission standard for the model year in which the debits were first incurred.

Additionally, to equalize the hydrocarbon debits that remain at the end of the three model year offset period: (1) hydrocarbon credits may be exchanged between passenger cars and light-duty trucks 6,000 pounds GVWR and under and 0-3,750 pounds LVW, and light-duty trucks 6,000 pounds GVWR and under and 3,751-5,750 pounds LVW and (2) hydrocarbon credits may be exchanged between light-duty trucks 6,001-8,500 pounds GVWR and medium-duty passenger vehicles, and medium-duty vehicles and heavy-duty vehicles.

⁶ *Vehicle Canister Bleed Emission.* Compliance with the canister bleed emission standard shall be determined based on the Bleed Emission Test Procedure described in the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles,” incorporated by reference in section 1976(c), and demonstrated on a stabilized canister system. Vehicles with a non-integrated refueling canister-only system are exempt from the canister bleed emission standard.

2. **Phase-In Schedule.** For each model year, a manufacturer shall certify, at a minimum, the specified percentage of its vehicle fleet to the evaporative emission standards set forth in section 1976(b)(1)(G)1.a. or section 1976(b)(1)(G)1.b., according to the schedule set forth below. For the purpose of this section 1976(b)(1)(G)2., the manufacturer's vehicle fleet consists of the vehicles produced and delivered for sale by the manufacturer in California that are subject to the emission standards in section 1976(b)(1)(G)1. All 2015 through 2022 model motor vehicles that are not subject to these standards pursuant to the phase-in schedule shall comply with the requirements for 2004 through 2014 model motor vehicles, as described in section 1976(b)(1)(F), or the optional zero-fuel evaporative emission standards for 2001 through 2014 model motor vehicles, as described in section 1976(b)(1)(E).

Model Years 2015, 2016, and 2017	Minimum Percentage of Vehicle Fleet⁽¹⁾⁽²⁾ Average of vehicles certified to section 1976(b)(1)(E) in model years 2012, 2013, and 2014⁽³⁾⁽⁴⁾
2018 and 2019	60
2020 and 2021	80
2022 and subsequent	100

¹ For the 2018 through 2022 model years only, a manufacturer may use an alternate phase-in schedule to comply with the phase-in requirements. An alternate phase-in schedule must achieve equivalent compliance volume by the end of the last model year of the scheduled phase-in (2022). The compliance volume is the number calculated by multiplying the percent of vehicles (based on the vehicles produced and delivered for sale by the manufacturer in California) meeting the new requirements in each model year by the number of years implemented prior to and including the last model year of the scheduled phase-in, then summing these yearly results to determine a cumulative total. The cumulative total of the five year (60/60/80/80/100) scheduled phase-in set forth above is calculated as follows: (60*5 years) + (60*4 years) + (80*3 years) + (80*2 years) + (100*1 year) = 1040. Accordingly, the required cumulative total for any alternate phase-in schedule of these emission standards is 1040. The Executive Officer shall consider acceptable any alternate phase-in schedule that results in an equal or larger cumulative total by the end of the last model year of the scheduled phase-in (2022).

² Small volume manufacturers are not required to comply with the phase-in schedule set forth in this table. Instead, they shall certify 100 percent of their 2022 and subsequent model year vehicle fleet to the evaporative emission standards set forth in section 1976(b)(1)(G)1.a. or section 1976(b)(1)(G)1.b.

³ The percentage of vehicle fleet averaged across the 2015, 2016, and 2017 model years shall be used to determine compliance with this requirement.

⁴ The minimum percentage required in the 2015, 2016, and 2017 model years is determined by averaging the percentage of vehicles certified to the emission standards in section 1976(b)(1)(E) in each of the manufacturer's 2012, 2013, and 2014 model year vehicle fleets. For the purpose of calculating this average, a manufacturer shall use the percentage of vehicles produced and delivered for sale in California for the 2012, 2013, and 2014 model years. A manufacturer may calculate this average percentage using the projected sales for these model years in lieu of actual sales.

3. ***Carry-Over of 2014 Model-Year Evaporative Families Certified to the Zero-Fuel Evaporative Emission Standards.*** A manufacturer may carry over 2014 model motor vehicles certified to the zero-fuel (0.0 grams per test) evaporative emission standards set forth in section 1976(b)(1)(E) through the 2019 model year and be considered compliant with the requirements of section 1976(b)(1)(G)1. For all motor vehicles that are certified via this carry-over provision, the emission standards set forth in section 1976(b)(1)(E) shall apply when determining in-use compliance throughout the vehicle's useful life. If the manufacturer chooses to participate in the fleet-average option for the highest whole vehicle diurnal plus hot soak emission standard, the following family emission limits are assigned to these evaporative families for the calculation of the manufacturer's fleet-average hydrocarbon emission value.

<i>Vehicle Type</i>	<i>Highest Whole Vehicle Diurnal + Hot Soak (grams per test)</i>
Passenger cars	0.300
Light-duty trucks 6,000 lbs. GVWR and under, and 0-3,750 lbs. LVW	0.300
Light-duty trucks 6,000 lbs. GVWR and under, and 3,751-5,750 lbs. LVW	0.400
Light-duty trucks 6,001-8,500 lbs. GVWR	0.500

4. ***Pooling Provision.*** The following pooling provision applies to the fleet-average option for the Highest Whole Vehicle Diurnal Plus Hot Soak Emission Standard in section 1976(b)(1)(G)1.b. and to the phase-in requirements in section 1976(b)(1)(G)2.

- a. For the fleet-average option set forth in section 1976(b)(1)(G)1.b., a manufacturer must demonstrate compliance, for each model year, based on one of two options applicable throughout the model year, either: Pooling Option 1: the total number of passenger cars, light-duty trucks, medium-duty passenger vehicles, medium-duty vehicles, and heavy-duty vehicles that are certified to the California evaporative emission standards in section 1976(b)(1)(G)1.b., and are produced and delivered for sale in California; or

Pooling Option 2: the total number of passenger cars, light-duty trucks, medium-duty passenger vehicles, medium-duty vehicles, and heavy-duty vehicles that are certified to the California evaporative emission standards in section 1976(b)(1)(G)1.b., and are produced and delivered for sale in California, the District of Columbia, and all states that have adopted California's evaporative emission standards set forth in section 1976(b)(1)(G)1. for that model year pursuant to section 177 of the federal Clean Air Act (42 U.S.C. § 7507).

- b. For the phase-in requirements in section 1976(b)(1)(G)2., a manufacturer must demonstrate compliance, for each model year, based on one of two options applicable throughout the model year, either:

Pooling Option 1: the total number of passenger cars, light-duty trucks, medium-duty passenger vehicles, medium-duty vehicles, and heavy-duty vehicles that are certified to the California evaporative emission standards in section 1976(b)(1)(G)1., and are produced and delivered for sale in California; or

Pooling Option 2: the total number of passenger cars, light-duty trucks, medium-duty passenger vehicles, medium-duty vehicles, and heavy-duty vehicles that are certified to the California evaporative emission standards in section 1976(b)(1)(G)1., and are produced and delivered for sale in California, the District of Columbia, and all states that have adopted California's evaporative emission standards set forth in section 1976(b)(1)(G)1. for that model year pursuant to section 177 of the federal Clean Air Act (42 U.S.C. § 7507).

- c. A manufacturer that selects Pooling Option 2 must notify the Executive Officer of that selection in writing before the start of the applicable model year or must comply with Pooling Option 1. Once a manufacturer has selected Pooling Option 2, that selection applies unless the manufacturer selects Option 1 and notifies the Executive Officer of that selection in writing before the start of the applicable model year.
 - d. When a manufacturer is demonstrating compliance using Pooling Option 2 for a given model year, the term "in California" as used in section 1976(b)(1)(G) means California, the District of Columbia, and all states that have adopted California's evaporative emission standards for that model year pursuant to Section 177 of the federal Clean Air Act (42 U.S.C. § 7507).
 - e. A manufacturer that selects Pooling Option 2 must provide to the Executive Officer separate values for the number of vehicles in each evaporative family produced and delivered for sale in the District of Columbia and for each individual state within the average.
5. Optional Certification for 2014 Model Motor Vehicles. A manufacturer may optionally certify its 2014 model motor vehicles to the evaporative emission standards set forth in section 1976(b)(1)(G)1.

6. *Effective leak diameter standard and procedure.* Manufacturers shall demonstrate that for 2018 and subsequent model vehicles $\leq 14,000$ lbs. GVWR certifying to the evaporative emission standards set forth in 1976(b)(1)(G), fuel systems do not exceed an effective leak diameter of 0.02 inches when tested in accordance with the test procedure sequence described in the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," incorporated by reference in section 1976(c). This requirement does not apply to 2021 and previous model vehicles certified by a small volume manufacturer. For vehicles with fuel tanks exceeding 25 gallons nominal fuel tank capacity, manufacturers may request approval from the Executive Officer for a leak standard greater than 0.020 inches, up to a maximum value of 0.040 inches.
7. *Auxiliary engines and fuel systems.* *Auxiliary engines and fuel systems.* For 2017 and subsequent model vehicles $\leq 6,000$ lbs. GVWR equipped with an auxiliary engine and 2018 and subsequent model vehicles $>6,000$ lbs. GVWR equipped with an auxiliary engine, manufacturers shall demonstrate compliance in accordance with the provisions set forth in the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," incorporated by reference in section 1976(c). These requirements do not apply to 2021 and previous model vehicles certified by a small volume manufacturer.

- (b) (2) Evaporative emissions for gasoline-fueled motorcycles subject to exhaust emission standards under this article shall not exceed:

Motorcycle Class	Model Year	Hydrocarbons (grams per test)
Class I and II (50-279cc)	1983 and 1984	6.0
	1985 and subsequent	2.0
Class III (280cc and larger)	1984 and 1985	6.0
	1986 and subsequent	2.0
Class III (280cc and larger) (Optional Standard for Small-Volume Motorcycle Manufacturers)	1986-1988	6.0

- (c) The test procedures for determining compliance with the standards in subsection (b) above applicable to 1978 through 2000 model year vehicles are set forth in “California Evaporative Emission Standards and Test Procedures for 1978-2000 Model Motor Vehicles,” adopted by the state board on April 16, 1975, as last amended August 5, 1999, which is incorporated herein by reference. The test procedures for determining compliance with standards applicable to 2001 and subsequent model year vehicles are set forth in the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles,” adopted by the state board on August 5, 1999, and as last amended December 6, 2012, which is incorporated herein by reference.
- (d) Motorcycle engine families certified to 0.2 grams per test or more below the applicable standards shall be exempted from the state board's “Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks” pursuant to section 2235, Title 13, California Code of Regulations.
- (e) Small volume motorcycle manufacturers electing to certify 1986, 1987, or 1988 model-year Class III motorcycles in accordance with the optional 6.0 grams per test evaporative emission standard shall submit, with the certification application, a list of the motorcycle models for which it intends to seek California certification and estimated sales data for such models. In addition, each such manufacturer shall, on or before July 1 of each year in which it certifies motorcycles under the optional standard, submit a report describing its efforts and progress toward meeting the more stringent evaporative emission standards. The report shall also contain a description of the manufacturer's current hydrocarbon evaporative emission control development status, along with supporting test data, and shall summarize future planned development work.
- (f) Definitions Specific to this Section.
 - (1) For purposes of this section, “small volume motorcycle manufacturer” means a manufacturer which sells less than 5,000 new motorcycles per year in California.
 - (2) For the purposes of this section, “ultra-small volume manufacturer” means any vehicle manufacturer with California sales less than or equal to 300 new vehicles per model year based on the average number of vehicles sold by the manufacturer in the previous three consecutive model years, and “small volume manufacturer” means, for 1978 through 2000 model years, any vehicle manufacturer with California sales less than or equal to 3000 new vehicles per model year based on the average number of vehicles sold by the manufacturer in the previous three consecutive model years. For 2001 and subsequent model motor vehicles, “small volume manufacturer” has the meaning set forth in section 1900(a).

- (3) “Non-integrated refueling emission control system” is defined in 40 Code of Federal Regulations § 86.1803-01.
- (4) “Non-integrated refueling canister-only system” means a subclass of a non-integrated refueling emission control system, where other non-refueling related evaporative emissions from the vehicle are stored in the fuel tank, instead of in a vapor storage unit(s).

NOTE: Authority cited: Sections 39500, 39600, 39601, 39667, 43013, 43018, 43101, 43104, 43105, 43106 and 43107, Health and Safety Code. Reference: Sections 39002, 39003, 39500, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204 and 43205, Health and Safety Code.

Title 13, California Code of Regulations

Adopt Section 1978.0.1 of title 13, California Code of Regulations, to read as follows:

**§ 1978.0.1 Standards and Test Procedures for Vehicle Refueling Emissions.
(Alternative)**

- (a) (1) Vehicle refueling emissions for 1998 and subsequent model gasoline-fueled, alcohol-fueled, diesel-fueled, liquefied petroleum gas-fueled, fuel-flexible, and hybrid electric passenger cars, light-duty trucks, and medium-duty vehicles with a gross vehicle weight rating less than 8501 pounds, 2015 and subsequent model gasoline-fueled, alcohol-fueled, diesel-fueled, liquefied petroleum gas-fueled, fuel-flexible, and hybrid electric medium-duty vehicles with a gross vehicle weight rating between 8,501 and 14,000 pounds, and 2022 and subsequent model gasoline-fueled, alcohol-fueled, diesel-fueled, liquefied petroleum gas-fueled, fuel-flexible, and hybrid electric heavy-duty vehicles with a gross vehicle weight rating greater than 14,000 pounds shall not exceed the following standards. Natural gas-fueled vehicles are exempt from meeting these refueling standards, but the refueling receptacles on natural gas-fueled vehicles must comply with the receptacle provisions of the American National Standards Institute Standard for Compressed Natural Gas Vehicle Fueling Connection Devices, ANSI NGV1-2006, which is incorporated herein by reference. The standards apply equally to certification and in-use vehicles.

Hydrocarbons (for gasoline-fueled, diesel-fueled, and hybrid electric vehicles):
0.20 grams per gallon of fuel dispensed.

Organic Material Hydrocarbon Equivalent (for alcohol-fueled, fuel-flexible, and hybrid electric vehicles): 0.20 grams per gallon of fuel dispensed. Hydrocarbons (for liquefied petroleum gas-fueled vehicles): 0.15 gram per gallon of fuel dispensed.

- (2) Vehicles powered by diesel fuel are not required to conduct testing to demonstrate compliance with the refueling emission standards set forth above, provided that:
- (A) The manufacturer can attest that the vehicle meets the 0.20 grams/gallon refueling emission standard; and
- (B) The certification requirement described in paragraph (A) is provided in writing and applies for the full useful life of the vehicle, as defined in section 2112.

In addition to the above provisions, the ARB reserves the authority to require testing to enforce compliance and to prevent noncompliance with the refueling emission standard.

Vehicles certified to the refueling emission standard under this provision shall not be counted in the phase-in sales percentage compliance determinations.

- (3) Through model year 2014, the manufacturer shall adhere to the following phase-in schedule, as determined by projected vehicle sales throughout the United States, with the exception of small volume manufacturers.

ORVR Model Year Phase-in Schedule			
Class of Vehicle	40% Fleet	80% Fleet	100% Fleet
Passenger Cars	1998	1999	2000
Light-Duty Trucks 0-6,000 lbs. GVWR	2001	2002	2003
Light-Duty Trucks/ Medium-Duty Vehicles (6,001- 8,500 lbs. GVWR)	2004	2005	2006

- (A) Prior to the 2001 model year, small volume manufacturers are defined for purposes of this section as any vehicle manufacturer with California actual sales less than or equal to 3000 new vehicles per model year based on the average number of vehicles sold by the manufacturer in the previous three consecutive years.
- (B) Small volume manufacturers of passenger cars, as defined in subsection (a)(3)(A), are exempt from the implementation schedule in subsection (a)(3) for model year 1998 and 1999. For small volume manufacturers of passenger cars, the standards of subsection (a)(1), and the associated test procedures, shall not apply until model year 2000, when 100 percent compliance with the standards of this section is required. Small volume manufacturers of light-duty trucks and medium-duty vehicles are not exempt from the implementation schedule in subsection (a)(3).
- (4) All vehicles subject to the refueling emission standards in section 1978(a)(1) shall demonstrate compliance except incomplete vehicles that are certified as incomplete vehicles for the purposes of evaporative emissions testing as set forth in the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," incorporated by reference in section 1976.
- (5) *Carry-Over of 2014 Model Year Families:* 2014 model year motor vehicles certified to the refueling emission standards of section 1978(a)(1) may carry over to the 2015 through 2018 model years and be considered compliant.

(b)

The test procedures for determining compliance with standards applicable to 1998 through 2000 gasoline, alcohol, diesel, and hybrid electric passenger cars, light-duty trucks, and medium-duty vehicles are set forth in the "California Refueling Emission Standards and Test Procedures for 1998-2000 Model Year Motor Vehicles," as amended August 5, 1999, which is incorporated herein by reference. The test procedures for determining compliance with standards applicable to 2001 and subsequent gasoline, alcohol, diesel, and hybrid electric passenger cars, light-duty trucks, and medium-duty vehicles are set forth in the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," adopted August 5, 1999, and last amended March 22, 2012, which is incorporated herein by reference.

NOTE: Authority cited: Sections 39500, 39600, 39601, 39667, 43013, 43018, 43101, 43104, 43105 and 43106, Health and Safety Code. Reference: Sections 39002, 39003, 39500, 39667, 43000, 43009.5, 43013, 43018, 43101, 43101.5, 43102, 43104, 43105, 43106, 43204 and 43205 Health and Safety Code.

Title 13, California Code of Regulations

Adopt Section 2037.0.1 of title 13, California Code of Regulations, to read as follows:

§ 2037.0.1 Defects Warranty Requirements for 1990 and Subsequent Model Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, and Motor Vehicle Engines Used in Such Vehicles. (Alternative)

(a) Applicability.

This section shall apply to 1990 and subsequent model passenger cars, light-duty trucks, medium-duty vehicles, and motor vehicle engines used in such vehicles. This section shall apply to medium-duty vehicles certified to the GHG emission standards of section 95663, title 17, for GHG emission control components, as set forth in 40 CFR 1037.120, as adopted November 14, 2011. The warranty period shall begin on the date the vehicle is delivered to an ultimate purchaser, or if the vehicle is first placed in service as a “demonstrator” or “company” car prior to delivery, on the date it is first placed in service.

(b) General Emissions Warranty Coverage.

The manufacturer of each motor vehicle or motor vehicle engine shall warrant to the ultimate purchaser and each subsequent purchaser that the vehicle or engine is:

- (1) Designed, built, and equipped so as to conform with all applicable regulations adopted by the Air Resources Board pursuant to its authority in chapters 1 and 2, part 5, division 26 of the Health and Safety Code; and
- (2) Free from defects in materials and workmanship which cause the failure of a warranted part to be identical in all material respects to the part as described in the vehicle or engine manufacturer's application for certification, including any defect in materials or workmanship which would cause the vehicle's on-board diagnostic malfunction indicator light to illuminate, for a period of three years or 50,000 miles, whichever first occurs; and
- (3) Free from defects in materials and workmanship which cause the failure of a warranted part described in section (c) below for seven years or 70,000 miles, whichever first occurs.

(c) “High-Priced” Warranted Parts.

- (1) Each manufacturer shall identify in its application for certification the “high-priced” warranted parts which are:

- (A) For 1990 through 2007 model year vehicles: [i] included on the Board's "Emissions Warranty Parts List" as last amended February 22, 1985, incorporated herein by reference, and; [ii] have an individual replacement cost at the time of certification exceeding the cost limit defined in section (c)(3);
- (B) For 2008 and subsequent model year vehicles: [i] subject to coverage as a warranted part in section (b)(2) above, and; [ii] have an individual replacement cost at the time of certification exceeding the cost limit defined in section (c)(3).
- (2) The replacement cost shall be the retail cost to a vehicle owner and include the cost of the part, labor, and standard diagnosis. The costs shall be those of the highest-cost metropolitan area of California.
- (3) The cost limit shall be calculated using the following equation:

$\text{Cost limit}_n = \$300 \times (\text{CPI}_{n-2} / 118.3)$ where:

Cost limit_n is the cost limit for the applicable model year of the vehicle rounded to the nearest ten dollars.

n is the model year of the new vehicles.

$n-2$ is the calendar year two years prior to the model year of the new vehicles.

CPI is the annual average nationwide urban consumer price index published by the United States Bureau of Labor Statistics.

- (4) The cost limit shall be revised annually by the Executive Officer. The highest-cost metropolitan area in California shall be identified by the Executive Officer for use in this section. If a manufacturer seeks certification of a vehicle before the applicable annual average CPI is available, the cost limit shall be calculated using the average of the monthly nationwide urban CPI figures for the most recent twelve month period for which figures have been published by the United States Bureau of Labor Statistics.
- (5) Each manufacturer shall submit to the Executive Officer the documentation used to identify the "high-priced" warranted parts required in this section. The documentation shall include the estimated retail parts costs, labor rates in dollars per hour, and the labor hours necessary to diagnose and replace the parts. The documentation is not required for vehicles certified before January 24, 1991.
- (6) The Executive Officer may reject or require modification of the manufacturer's list of "high-priced" warranted parts to ensure that such list includes all emission-related parts whose replacement cost exceeds the cost limit defined in section (c)(3)

- (d) Subject to the conditions and exclusions of section (i), the warranty on emission-related parts shall be interpreted as follows:
- (1) Any warranted part which is not scheduled for replacement as required maintenance in the written instructions required by section (e) shall be warranted for the applicable warranty period defined in section (b)(2) or (3). If any such part fails during the period of warranty coverage, it shall be repaired or replaced by the vehicle or engine manufacturer according to section (d)(4) below. Any such part repaired or replaced under the warranty shall be warranted for the remaining warranty period.
 - (2) Any warranted part which is scheduled only for regular inspection in the written instructions required by section (e) shall be warranted for the applicable warranty period defined in section (b)(2) or (3). A statement in such written instructions to the effect of "repair or replace as necessary" shall not reduce the period of warranty coverage. Any such part required or replaced under warranty shall be warranted for the remaining warranty period.
 - (3) Any warranted part which is scheduled for replacement as required maintenance in the written instructions required by section (e) shall be warranted for the period of time or mileage, whichever first occurs, prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part shall be repaired or replaced by the vehicle or engine manufacturer according to section (d)(4) below. Any such part required or replaced under warranty shall be warranted for the remainder of the period prior to the first scheduled replacement point for the part.
 - (4) Repair or replacement of any warranted part under the warranty provisions of this article shall be performed at no charge to the vehicle or engine owner at a warranty station, except in the case of an emergency when a warranted part or a warranty station is not reasonably available to the vehicle or engine owner. In an emergency, repairs may be performed at any available service establishment, or by the owner, using any replacement part. The manufacturer shall reimburse the owner for his or her expenses including diagnostic charges for such emergency repair or replacement, not to exceed the manufacturer's suggested retail price for all warranted parts replaced and labor charges based on the manufacturer's recommended time allowance for the warranty repair and the geographically appropriate hourly labor rate. A vehicle or engine owner may reasonably be required to keep receipts and failed parts in order to receive compensation for warranted repairs reimbursable due to an emergency, provided the manufacturer's written instructions required by section (e) advise the owner of this obligation.

- (5) Notwithstanding the provisions of subsection (d)(4) above, warranty services or repairs shall be provided at all of a manufacturer's dealerships which are franchised to service the subject vehicles or engines.
- (6) The vehicle or engine owner shall not be charged for diagnostic labor which leads to the determination that a warranted part is defective, provided that such diagnostic work is performed at a warranty station.
- (7) The vehicle or engine manufacturer shall be liable for damages to other vehicle components proximately caused by a failure under warranty of any warranted part.
- (8) Throughout the vehicle or engine's warranty period defined in section (b)(2) and (b)(3), the vehicle or engine manufacturer shall maintain a supply of warranted parts sufficient to meet the expected demand for such parts. The lack of availability of such parts or the incompleteness of repairs within a reasonable time period, not to exceed 30 days from the time the vehicle or engine is initially presented to the warranty station for repair, shall constitute an emergency for purposes of section (d)(4) above.
- (9) Any replacement part may be used in the performance of any maintenance or repairs. Any replacement part designated by a manufacturer may be used in warranty repairs provided without charge to the vehicle owner. Such use shall not reduce the warranty obligations of the vehicle or engine manufacturer, except that the vehicle or engine manufacturer shall not be liable under this article for repair or replacement of any replacement part which is not a warranted part (except as provided under section (d)(7) above).
- (10) Any add-on or modified part exempted by the Air Resources Board from the prohibitions of Vehicle Code section 27156 may be used on a vehicle or engine. Such use, in and of itself, shall not be grounds for disallowing a warranty claim made in accordance with this article. The vehicle or engine manufacturer shall not be liable under this article to warrant failures of warranted parts caused by the use of such an add-on or modified part.
- (11) The Executive Officer may request and, in such case, the vehicle or engine manufacturer shall provide, any documents which describe the manufacturer's warranty procedures or policies.
- (e) Each manufacturer shall furnish with each new vehicle or engine, written instructions for the maintenance and use of the vehicle or engine by the owner, and the instructions shall be consistent with this article and applicable regulations in article 2 of this subchapter.
- (f) Each manufacturer shall furnish with each new vehicle or engine a list of the "high-priced" warranted parts established by section (c).

- (g) Prior to the 2001 model year, each manufacturer shall submit the documents required by sections (c)(5), (e), and (f) with the manufacturer's preliminary application for new vehicle or engine certification for approval by the Executive Officer. For 2001 and subsequent model years, each manufacturer shall submit the documents required by section (c)(5), (e), and (f) with the Part 2 Application for Certification pursuant to the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," incorporated by reference in title 13, CCR section 1961(d), or the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," incorporated by reference in title 13, CCR section 1961.2(d), as applicable. The Executive Officer may reject or require modification of any of the documents required by sections (c), (e), and (f) for, among other reasons, incompleteness and lack of clarity. Approval by the Executive Officer of the documents required by sections (c), (e), and (f) shall be a condition of certification. The Executive Officer shall approve or disapprove the documents required by sections (c), (e), and (f) within 90 days of the date such documents are received from the manufacturer. Any disapproval shall be accompanied by a statement of the reasons thereof. In the event of disapproval, the manufacturer may petition the Board to review the decision of the Executive Officer.
- (h) *Vehicle Inspection Program.*
- (1) This section applies to 1990 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles which fail to pass a smog check inspection pursuant to Health and Safety Code section 44012 after the warranty period of three years or 50,000 miles, whichever occurs first, has expired, but before the warranty period of seven years or 70,000 miles, whichever occurs first, has expired. The provisions of this section shall be contained in the warranty statement required pursuant to title 13, CCR section 2039.
- (2) The owner of a vehicle which fails an inspection during the period described in section (h)(1) may choose to have the vehicle repaired at a warranty station.
- (A) If the warranty station identifies that the inspection failure was caused by the failure or malfunction of a "high-priced" part defined in section (c), then the vehicle manufacturer shall be liable for expenses involved in detecting and correcting the part failure or malfunction, unless the warranty station demonstrates that the part failure or malfunction was caused by abuse, neglect, or improper maintenance as specified in section (i).

- (B) If the warranty station demonstrates that the inspection failure was caused by one or more conditions excluded from warranty coverage pursuant to section (i), the vehicle owner shall be liable for all diagnostic and repair expenses. Such expenses shall not exceed the maximum repair costs permissible under the inspection program.
 - (C) If the warranty station determines that the inspection failure was caused by one or more defects covered under warranty pursuant to these regulations and in combination with one or more conditions excluded from warranty coverage pursuant to section (i), then the vehicle owner shall not be charged for the diagnostic and repair costs related to detecting and repairing the warrantable defects.
- (3) In the alternative, the owner of a vehicle which fails the inspection may choose to have the vehicle repaired at other than a warranty station. If a warrantable defect is found, the vehicle owner may deliver the vehicle to a warranty station and have the defect corrected free of charge. The vehicle manufacturer shall not be liable for any expenses incurred at a service establishment not authorized to perform warranty repairs, except in the case of an emergency as defined in section (d)(4). If the vehicle owner chooses to have a warrantable defect repaired at other than a warranty station, the upper cost limit pursuant to Health and Safety Code section 44017 shall not apply to the repair.
- (i) Exclusions.

The repair or replacement of any warranted part otherwise eligible for warranty coverage under sections (d) and (h) shall be excluded from such warranty coverage if the vehicle or engine manufacturer demonstrates that the vehicle or engine has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for the repair or replacement of the part.

Credits

Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600 and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38560, 43106, 43204, 43205, 44004, 44010, 44011, 44012, 44015 and 44017, Health and Safety Code

Title 13, California Code of Regulations

Adopt Section 2038.0.1 of title 13, California Code of Regulations, to read as follows:

§ 2038.0.1. Performance Warranty Requirements for 1990 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and Motor Vehicle Engines Used in Such Vehicles. (Alternative)

(a) Applicability.

This section shall apply to 1990 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles, and motor vehicle engines used in such vehicles required to be inspected under any California statutorily authorized motor vehicle emissions inspection and maintenance program. The warranty period shall begin on the date the vehicle is delivered to an ultimate purchaser, or if the vehicle is first placed in service as a “demonstrator” or “company” car prior to delivery, on the date it is first placed in service.

(b) General Emissions Warranty Coverage.

The manufacturer of each passenger car, light-duty truck, and medium-duty vehicle shall warrant to the ultimate purchaser and each subsequent purchaser that the vehicle or engine:

- (1) Is designed, built, and equipped so as to conform with all applicable regulations adopted by the Air Resources Board pursuant to its authority in chapters 1 and 2, part 5, division 26 of the Health and Safety Code; and
- (2) Will, for a period of three years or 50,000 miles, whichever first occurs, pass an inspection established under section 44012 of the Health and Safety Code (“inspection”).

(c) Written Instructions.

- (1) Each vehicle or engine manufacturer shall furnish with each new vehicle or engine, written instructions for the required maintenance and use of this vehicle or engine by the vehicle owner (written instructions), and the written instructions shall be consistent with this article and applicable regulations in article 2 of this subchapter.
- (2) Prior to the 2001 model year, each vehicle or engine manufacturer shall submit the documents required by section (c)(1) with the vehicle or engine manufacturer's preliminary application for new vehicle or engine certification for approval by the Executive Officer.

- (3) For 2001 and subsequent model years, each vehicle or engine manufacturer shall submit the documents required by section (c)(1) with the Part 2 Application for Certification pursuant to the "California 2001 through 2014 Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2009 through 2016 Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," incorporated by reference in title 13, CCR section 1961(d), or the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," incorporated by reference in title 13, CCR section 1961.2(d), as applicable.
 - (4) The Executive Officer may reject or require modification of written instructions for, among other reasons, incompleteness or lack of clarity. Approval by the Executive Officer of the written instructions shall be a condition of certification. The Executive Officer shall approve or disapprove the written instructions within 90 days of the date such documents are received from the vehicle or engine manufacturer. Any disapproval shall be accompanied by a statement of the reasons therefore. In the event of disapproval, the engine or vehicle manufacturer may petition the Board to review the decision of the Executive Officer.
- (d) Proper Use and Maintenance.
- (1) An emission performance warranty claim may be denied if the vehicle or engine manufacturer demonstrates that the vehicle or engine's failure of the inspection was directly caused by abuse, neglect, or improper maintenance as reflected by a failure to maintain or use the vehicle or engine in accordance with the written instructions.
 - (2) Except as provided in section (d)(5), a vehicle or engine manufacturer may deny an emission performance warranty claim on the basis of noncompliance with the written instructions only if:
 - (A) An owner is not able to comply with a request by a manufacturer for evidence pursuant to section (d)(4); or

- (B) Notwithstanding the evidence presented pursuant to section (d)(4), the vehicle or engine manufacturer is able to prove that the vehicle failed an inspection because the vehicle was abused, the required maintenance and use was performed in a manner resulting in a component being improperly installed or a component or related parameter being adjusted substantially outside of the vehicle or engine manufacturer's specifications, or maintenance was performed on a vehicle which resulted in the removing or rendering inoperative of any component affecting the vehicle's emissions.
- (3) When determining whether an owner has complied with the written instructions, a vehicle or engine manufacturer may require a owner to submit evidence of compliance only with those written instructions for which the vehicle or engine manufacturer has an objective reason for believing:
 - (A) Were not performed, and;
 - (B) If not performed, could be the cause of the particular vehicle's failed inspection.
- (4) Evidence of compliance with a maintenance instruction may consist of:
 - (A) A maintenance log book which has been validated at the approximate time or mileage intervals specified in the written instructions by someone who regularly engages in the business of servicing automobiles for the relevant maintenance; or
 - (B) A repair order, sales receipt, or similar evidence showing that the vehicle has been submitted for scheduled maintenance at the approximate time or mileage intervals specified in the written instructions to someone who regularly engages in the business of servicing automobiles for the purpose of performing the relevant maintenance; or
 - (C) A statement by the vehicle owner that the maintenance was performed at the approximate time or mileage interval specified in the written instructions using proper replacement parts.
- (5) In no case may a vehicle or engine manufacturer deny an emission performance warranty claim on the basis of:
 - (A) Warranty work or predelivery service performed by any facility authorized by the vehicle or engine manufacturer to perform such work or service; or

- (B) Work performed in an emergency situation to rectify an unsafe condition, including an unsafe driveability condition, attributable to the vehicle or engine manufacturer, provided the vehicle owner has taken steps to put the vehicle back in a conforming condition in a timely manner; or
 - (C) Any cause attributable to the vehicle or engine manufacturer; or
 - (D) The use of any fuel which is commonly available in the geographical area in which the vehicle or engine is located, unless the written instructions specify that the use of that fuel would adversely affect the emission control devices and systems of the vehicle, and there is commonly available information for the vehicle owner to identify the proper fuel to be used.
- (6) The vehicle owner may perform maintenance or have maintenance performed more frequently than required in the written instructions.
- (7) Except as specified in section (d)(2)(B) above, failure of the vehicle or engine owner to ensure the performance of such scheduled maintenance or to keep maintenance records shall not, per se, be grounds for disallowing a warranty claim.
- (e) Repair, adjustment, or replacement of any part under the warranty provisions of this article shall be performed at no charge to the vehicle or engine owner at a warranty station, except where a warranted part is not available to the vehicle or engine owner within a reasonable time (in no case more than 30 days) after the vehicle or engine is initially presented to the warranty station for repair. In case of such unavailability, repairs may be performed at any available service establishment, or by the owner, using any replacement part. The manufacturer shall reimburse the owner for his or her expenses including diagnostic charges for such repair or replacement, not to exceed the manufacturer's suggested retail price for all warranted parts replaced and labor charges based on the manufacturer's recommended time allowance for the warranty repair and the geographically appropriate hourly labor rate. A vehicle or engine owner may reasonably be required to keep receipts and failed parts in order to receive reimbursement due to such unavailability, provided the manufacturer's written instructions advise the owner of this obligation.
- (f) The vehicle or engine manufacturer shall be liable for damages to other vehicle components proximately caused by a failure under warranty of any warranted part.

- (g) Any replacement part may be used in the performance of any maintenance or repairs. Any replacement part designated by a vehicle or engine manufacturer may be used in warranty repairs provided without charge to the vehicle owner. Such use shall not reduce the warranty obligations of the vehicle or engine manufacturer, except that the vehicle or engine manufacturer shall not be liable under this article for repair or replacement of any replacement part which is not a warranted part (except as provided under section (d) above).
- (h) Any add-on or modified part exempted by the Air Resources Board from the prohibitions of Vehicle Code section 27156 may be used on a vehicle or engine. Such use, in and of itself, shall not be grounds for disallowing a warranty claim made in accordance with this article. The vehicle or engine manufacturer shall not be liable under this article to warrant failures of warranted parts caused by the use of such an add-on or modified part.
- (i) Warranty Claim Procedures.
 - (1) A warranty claim may be submitted by bringing a vehicle to any repair facility authorized by the vehicle or engine manufacturer to service that vehicle.
 - (2) The manufacturer of each vehicle or engine to which the warranty is applicable shall establish procedures as to the manner in which a claim under the emission performance warranty is to be processed. The procedures shall provide for a final decision and repair of a warrantable condition by the vehicle or engine manufacturer within a reasonable time, not to exceed 30 days from the time at which the vehicle is initially presented for repair, or unless a delay:
 - (A) is requested by the vehicle owner, or
 - (B) is caused by an event not attributable to the vehicle or engine manufacturer or the warranty station.
 - (3) Within the time period specified in section (i)(2), the manufacturer shall provide the owner, in writing, with an explanation as to why the claim is being denied.
 - (4) Failure to notify a vehicle owner that a warrantable condition does not exist within the required time period of section (i)(2), for reasons other than those provided for in sections (i)(2)(A) and (B), shall result in the vehicle or engine manufacturer being responsible for repairing the vehicle free of charge to the vehicle owner.
 - (5) The vehicle or engine manufacturer shall incur all costs associated with a determination that an emission performance warranty claim is valid.

- (j) Warranty services or repairs shall be provided at all of a vehicle or engine manufacturer's dealerships which are franchised to service the subject vehicles or engines.
- (k) The vehicle owner shall not be charged for diagnostic labor which leads to the determination of a warrantable condition provided that such diagnostic work is performed at a warranty station.
- (l) Throughout the vehicle or engine's warranty period defined in section (b), the vehicle or engine manufacturer shall maintain a supply of warranted parts sufficient to meet the expected demand for such parts. The lack of availability of such parts or the incompleteness of the repairs within a reasonable time period, not to exceed 30 days from the time the vehicle or engine is initially presented to the warranty station for repair, shall constitute an unavailability of parts for purposes of section (e).
- (m) The Executive Officer may request and, in such case, the vehicle or engine manufacturer shall provide, any documents which describe the vehicle or engine manufacturer's warranty procedures or policies.

Note: Authority cited: Sections 39600 and 39601, Health and Safety Code. Reference: Sections 43106, 43204, 43205, 44004, 44010, 44011, 44012, 44014 and 44015, Health and Safety Code.

Title 13, California Code of Regulations

Adopt Section 2112.0.1 of title 13, California Code of Regulations, to read as follows:

§ 2112.0.1 Definitions. (Alternative)

- (a) "Capture rate" means the percentage of in-use vehicles subject to recall which must be corrected to bring the class or category of vehicles into compliance. The number of vehicles subject to recall shall be based on the actual number of vehicles in use as verified by the Department of Motor Vehicles registration records, or vehicle or engine registration records compiled and prepared by R. L. Polk and Company or a comparable source at the time a recall is initiated.
- (b) "Correlation factor" means a pollutant-specific multiplicative factor calculated by a manufacturer for an engine family or test group which establishes a relationship between chassis exhaust emission data, as determined from the test procedures specified in section 1960.1, 1961, or 1961.2 Title 13, California Code of Regulations, and engine exhaust emission data, as determined from the test procedures specified in section 1956.8, Title 13, California Code of Regulations.
- (c) "Days", when computing any period of time, means normal working days on which a manufacturer is open for business, unless otherwise noted.
- (d) "Emission-Related Failure" means a failure of a device, system, or assembly described in the approved application for certification which affects any parameter, specification, or component enumerated in Appendix A to this subchapter 2.5 or listed in the Emission Warranty Parts List pursuant to section 2036, Title 13, California Code of Regulations, except for failures of devices, systems and assemblies which the Executive Officer has deleted from the manufacturer's list of warranted parts pursuant to section 2036(f), Title 13, California Code of Regulations.
- (e) "Emission Warranty Claim" means an adjustment, inspection, repair or replacement of a specific emission-related component for which the vehicle or engine manufacturer is invoiced or solicited by a repairing agent for compensation pursuant to warranty provisions, regardless of whether compensation is actually provided.
- (f) "Executive Officer" means the Executive Officer of the Air Resources Board or his or her authorized representative.
- (g) "Influenced Emission Recall" means an inspection, repair, adjustment, or modification program initiated and conducted by a manufacturer or its agent or representative as a result of in-use enforcement testing or other evidence of noncompliance provided or required by the Board, to remedy any nonconformity for which direct notification of vehicle or engine owners is necessary.

- (h) "Nonconformity" or "noncompliance" exists whenever:
- (1) a substantial number of a class or category of vehicles or engines, although properly maintained and used, experience a failure of the same emission-related component within their useful lives which, if uncorrected, results in the vehicles' or engines' failure to meet the applicable standards; or
 - (2) a class or category of vehicles or engines within their useful lives, although properly maintained and used, on average does not comply with the emission standards prescribed under section 43101 or the Health and Safety Code which are applicable to the model-year of such vehicles or engines.
- (i) "Ordered Emission Recall" means an inspection, repair, adjustment, or modification program required by the Board and conducted by the manufacturer or its agent or representative to remedy any nonconformity for which direct notification of vehicle or engine owners is necessary.
- (j) "Quarterly reports" refer to the following calendar periods: January 1-March 31, April 1-June 30, July 1-September 30, October 1-December 31.
- (k) "Ultimate purchaser" has the same meaning as defined in section 39055.5 of the Health and Safety Code.
- (l) "Useful life" means, for the purposes of this article:
- (1) For Class I motorcycles and motorcycle engines (50 to 169 cc or 3.1 to 10.4 cu. in.), a period of use of five years or 12,000 kilometers (7,456 miles), whichever first occurs.
 - (2) For Class II motorcycles and motorcycle engines (170 to 279 cc or 10.4 to 17.1 cu. in.), a period of use of five years or 18,000 kilometers (11,185 miles), whichever first occurs.
 - (3) For Class III motorcycles and motorcycle engines (280 cc and larger or 17.1 cu. in. and larger), a period of use of five years or 30,000 kilometers (18,641 miles), whichever first occurs.
 - (4) For 1982 through 1984 model-year diesel heavy-duty vehicles (except medium-duty vehicles), and 1982 through 1984 model-year motor vehicle engines used in such vehicles, a period of use of five years, 100,000 miles, or 3000 hours of operation, whichever first occurs.

- (5) For 1982 through 1987 model-year gasoline heavy-duty vehicles (except medium-duty vehicles) certified using the steady-state emission standards and test procedures, and 1982 through 1987 model-year gasoline heavy-duty motor vehicle engines certified using the steady-state emission standards and test procedures, a period of use of five years or 50,000 miles, whichever first occurs.
- (6) For 1987 through 2003 model-year gasoline heavy-duty vehicles (except medium-duty vehicles) certified to the transient emission standards and test procedures, and 1987 and subsequent model-year gasoline heavy-duty motor vehicle engines certified using the transient emission standards and test procedures, a period of use of eight years or 110,000 miles, whichever first occurs, except as noted in paragraph (13).
- (7) For 1985 through 2003 model-year heavy-duty diesel urban buses, and 1985 through 2003 model-year heavy-duty diesel engines to be used in urban buses, and for 1985 through 2003 model-year diesel heavy-duty vehicles (except medium-duty vehicles), and 1985 through 2003 model-year motor vehicle engines used in such vehicles, a period of use of eight years or 110,000 miles, whichever first occurs, for diesel light, heavy-duty vehicles; eight years or 185,000 miles, whichever first occurs, for diesel medium, heavy-duty vehicles; and eight years or 290,000 miles, whichever first occurs, for diesel heavy, heavy-duty vehicles, except as provided in paragraphs (11), (14), (15) and (16); or any alternative useful life period approved by the Executive Officer. (The classes of diesel light, medium, and heavy, heavy-duty vehicles are defined in 40 CFR section 86.085-2, as amended November 16, 1983.)
- (8) For light-duty and medium-duty vehicles certified under the Optional 100,000 Mile Certification Procedure, and motor vehicle engines used in such vehicles, a period of use of ten years or 100,000 miles, whichever first occurs.
- (9) For 2001 through 2019 model year medium-duty low-emission, ultra-low-emission and super-ultra-low-emission vehicles certified to the primary standards in section 1961(a)(1). and motor vehicle engines used in such vehicles, a period of use of ten years or 120,000 miles, whichever occurs first. For 2001 through 2019 medium-duty low-emission, ultra-low-emission and super-ultra-low-emission vehicles certified to the optional 150,000 mile standards in section 1961(a)(1), and motor vehicle engines used in such vehicles, a period of use of fifteen years or 150,000 miles, whichever occurs first. For all other 1995 and subsequent model-year medium-duty vehicles and motor vehicle engines used in such vehicles, and 1992 through 1994 model-year medium-duty low-emission and ultra-low-emission vehicles certified to the standards in Section 1960.1(h)(2), and motor vehicle engines used in such vehicles, a period of use of eleven years or 120,000 miles, whichever occurs first.

- (10) For all other light-duty and medium-duty vehicles, and motor vehicle engines used in such vehicles, a period of use of five years or 50,000 miles, whichever first occurs. For those passenger cars, light-duty trucks and medium-duty vehicles certified pursuant to section 1960.1.5, Title 13, California Code of Regulations, the useful life shall be seven years, or 75,000 miles, whichever first occurs; however, the manufacturer's reporting and recall responsibility beyond 5 years or 50,000 miles shall be limited, as provided in section 1960.1.5. For those passenger cars and light-duty trucks certified pursuant to Title 13, California Code of Regulations, section 1960.1(f) and section 1960.1(g), the useful life shall be ten years or 100,000 miles, whichever first occurs; however, for those vehicles certified under section 1960.1(f), the manufacturer's warranty failure and defects reporting and recall responsibility shall be subject to the conditions and standards specified in section 1960.1(f).
- (11) For 1994 through 2003 model-year heavy heavy-duty diesel urban buses, and 1994 through 2003 model-year heavy heavy-duty diesel engines to be used in urban buses, for the particulate standard, a period of use of ten years or 290,000 miles, whichever first occurs; or any alternative useful life period approved by the Executive Officer.
- (12) For 1997 and subsequent model year off-road motorcycles, all terrain vehicles, and for 2007 and subsequent model year off-road sport vehicles, off-road utility vehicles, sand cars, and engines used in such vehicles, a period of use of five years or 10,000 kilometers (6,250 miles), whichever first occurs.
- (13) For 1998 through 2003 model-year gasoline heavy-duty engines, for the NOx standard, a period of use of ten years or 110,000 miles, whichever first occurs; or any alternative useful life period approved by the Executive Officer.
- (14) For 1998 through 2003 model-year light heavy-duty diesel engines, for the NOx standard, a period of use of ten years or 110,000 miles, whichever first occurs; or any alternative useful life period approved by the Executive Officer.
- (15) For 1998 through 2003 model-year medium heavy-duty diesel engines, for the NOx standard, a period of use of ten years or 185,000 miles, whichever first occurs; or any alternative useful life period approved by the Executive Officer.
- (16) For 1998 through 2003 model-year heavy heavy-duty diesel engines, for the NOx, standard, a period of use of ten years or 290,000 miles, whichever first occurs; or any alternative useful life period approved by the Executive Officer.

- (17) For those passenger cars and light-duty trucks certified to the primary standards in section 1961.2(a)(1), the useful life shall be ten years or 120,000 miles, whichever occurs first. For 2001 and subsequent passenger car and light-duty truck low-emission, ultra-low-emission and super-ultra-low-emission vehicles certified to the optional 150,000 mile standards in section 1961(a)(1), and motor vehicle engines used in such vehicles, a period of use of fifteen years or 150,000 miles, whichever occurs first.
- (18) For those passenger cars, light-duty trucks, and medium-duty vehicles certified to the standards in section 1961.2 or 1961.3, the useful life shall be fifteen years or 150,000 miles, whichever occurs first.
- (19) For 2004 and subsequent model-year medium heavy-duty diesel engines, for carbon monoxide, particulate, and oxides of nitrogen plus non-methane hydrocarbons emissions standards, a period of use of ten years or 185,000 miles, whichever first occurs; or any alternative useful life period approved by the Executive Officer.
 - (19.1) For 2004 and subsequent model-year light heavy-duty diesel engines certified to the Greenhouse Gas emission standards in section 1956.8(a)(7), title 13, CCR, for carbon dioxide, nitrous oxide, and methane emission standards, a period of use of ten years or 110,000 miles, whichever first occurs, or any alternative useful life period approved by the Executive Officer.
- (20) For 2004 and subsequent model-year medium heavy-duty diesel engines, for carbon monoxide, particulate, and oxides of nitrogen plus non-methane hydrocarbons emissions standards, a period of use of ten years or 185,000 miles, whichever first occurs; or any alternative useful life period approved by the Executive Officer.
 - (20.1) For 2004 and subsequent model-year medium heavy-duty diesel engines certified to the Greenhouse Gas emission standards in section 1956.8(a)(7), title 13, CCR, for carbon dioxide, nitrous oxide, and methane emission standards, a period of 14 use of ten years or 185,000 miles, whichever first occurs, or any alternative useful life period approved by the Executive Officer.
- (21) For 2004 and subsequent model-year heavy heavy-duty diesel engines, 2004 and subsequent model-year heavy-duty diesel urban buses, 2004 and subsequent model-year heavy-duty diesel engines to be used in urban buses, and 2004 and subsequent model year hybrid-electric urban buses for carbon monoxide, particulate, and oxides of nitrogen plus non-methane hydrocarbon emissions standards, a period of use of 10 years or 435,000 miles, or 22,000 hours, whichever first occurs, or any alternative useful life period approved by the Executive Officer, except as provided in paragraphs (21)(A) and (21)(B).

- (A) The useful life limit of 22,000 hours in paragraph (20) of this definition is effective as a limit to the useful life only when an accurate hours meter is provided by the manufacturer with the engine and only when such hours meter can reasonably be expected to operate properly over the useful life of the engine.
 - (B) For an individual engine, if the useful life hours limit of 22,000 hours is reached before the engine reaches 10 years or 100,000 miles, the useful life shall become 10 years or 100,000 miles, whichever occurs first, as required under Clean Air Act section 202(d)(42 U.S.C. 7521(d)).
- (21.1) For 2004 and subsequent model-year heavy heavy-duty diesel engines certified to the Greenhouse Gas emission standards in section 1956.8(a)(7), title 13, CCR, for carbon dioxide, nitrous oxide, and methane emission standards, a period of use of ten years or 435,000 miles, or 22,000 hours, whichever first occurs, or any alternative useful life period approved by the Executive Officer, except as provided in paragraphs (21)(A) and (21)(B).
- (22) For 2004 and subsequent model-year heavy-duty Otto-cycle engines, for carbon monoxide, particulate, and oxides of nitrogen plus non-methane hydrocarbon emissions standards, a period of use of 10 years or 110,000 miles, whichever first occurs.
- (22.1) For 2004 and subsequent model-year heavy-duty Otto-cycle engines certified to the Greenhouse Gas emission standards in section 1956.8(h)(6), title 13, CCR, for carbon dioxide, nitrous oxide, and methane emissions standards, the useful life shall be a period of use of ten years or 110,000 miles, whichever first occurs.
- (23) For 2000 and later model year off-road compression-ignition engines, for oxides of nitrogen, hydrocarbon, oxides of nitrogen plus hydrocarbon (when applicable), carbon monoxide, particulate emission standards, and for smoke opacity:
 - (A) For all engines rated under 19 kilowatts, and for constant-speed engines rated under 37 kilowatts with rated speeds greater than or equal to 3,000 revolutions per minute, a period of use of five years or 3,000 hours of operation, whichever first occurs.
 - (B) For all other engines rated above 19 kilowatts and under 37 kilowatts, a period of use of seven years or 5,000 hours of operation, whichever first occurs.
 - (C) For engines rated at or above 37 kilowatts, a period of use of ten years or 8,000 hours of operation, whichever first occurs.

- (24) California-certified 2009 and subsequent model year spark-ignition inboard and sterndrive marine engines complying with the Option 1 requirements in Section 2442(b)(1) and California-certified 2008 and subsequent model-year spark-ignition inboard and sterndrive marine engines complying with the Option 2 requirements in Section 2442(b)(1), a period of ten years or 480 hours, whichever first occurs for engines 485 kilowatts and less, For engines greater than 485 kilowatts, a period of one year or 50 hours, whichever first occurs. Manufacturers of engines greater than 485 kilowatts may petition the Executive Officer for a approval of a shorter period when appropriate.
- (25) For 2014 and subsequent model-year heavy-duty vehicles at or below 19,500 pounds GVWR, certified to the GHG emission standards of section 95663, title 17, CCR, the useful life shall be ten years or 110,000 miles, whichever first occurs.
- (26) For 2014 and subsequent model-year heavy-duty vehicles above 19,500 pounds and at or below 33,000 pounds GVWR, certified to the GHG emission standards 15 of section 95663, title 17, CCR, the useful life shall be ten years or 185,000 miles, whichever first occurs.
- (27) For 2014 and subsequent model-year heavy-duty vehicles above 33,000 pounds GVWR, certified to the GHG emission standards of section 95663, title 17, CCR, the useful life shall be ten years or 435,000 miles, whichever first occurs.
- (m) "Vehicle or engine manufacturer" means the manufacturer granted certification for a motor vehicle or motor vehicle engine.
- (n) "Voluntary Emission Recall" means an inspection, repair, adjustment, or modification program voluntarily initiated and conducted by a manufacturer or its agent or representative to remedy any nonconformity for which direct notification of vehicle or engine owners is necessary.

Appendix A to Article 2.1

California In-Use Vehicle Emission-Related Recall Procedures, Enforcement Test Procedures, and Failure Reporting Procedures for 1982 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, Heavy-Duty Vehicles and Engines, Motorcycles, 1997 and Subsequent Model-Year Off-Road Motorcycles and All -Terrain Vehicles, 2000 and Subsequent Model-Year Off-Road Compression-Ignition Engines, and 2008 and Subsequent Model-Year Spark-Ignition Inboard and Sterndrive Marine Engines.

Vehicle and Engine Parameters, Components, and Specifications

I. Passenger Car, Light-Duty Truck, Medium-Duty Vehicle, Motor-cycle, and Inboard and Sterndrive Parameters and Specifications.

A. Basic Engine Parameters-Reciprocating Engines.

1. Compression ratio.
2. Cranking compression pressure.
3. Valves (intake and exhaust).
 - a. Head diameter dimension.
 - b. Valve lifter or actuator type and valve lash dimension.
4. Turbocharger calibrations.
5. Camshaft timing.
 - a. Valve opening (degrees BTDC).
 - b. Valve closing (degrees ATDC).
 - c. Valve overlap (inch-degrees).

B. Basic Engine Parameters-Rotary Engines.

1. Intake port(s): Timing and overlap if exposed to the combustion chamber.
2. Exhaust port(s): Timing and overlap if exposed to the combustion chamber.
3. Cranking compression pressure.
4. Compression ratio.

C. Air Inlet System: Temperature control system calibration.

D. Fuel System.

1. General
 - a. Engine idle speed.
 - b. Engine idle mixture.
2. Carburetion.
 - a. Air-fuel flow calibration.
 - b. Transient enrichment system calibration.
 - c. Starting enrichment system calibration.
 - d. Altitude compensation system calibration.
 - e. Hot idle compensation system calibration.
3. Fuel injection.

- a. Control parameters and calibrations.
- b. Fuel shutoff system calibration.
- c. Starting enrichment system calibration.
- d. Transient enrichment system calibration.
- e. Air-fuel flow calibration.
- f. Altitude compensation system calibration.
- g. Operating pressure(s).
- h. Injector timing calibrations.

E. Ignition System.

- 1. Control parameters and calibrations.
- 2. Initial timing setting.
- 3. Dwell setting.
- 4. Altitude compensation system calibration.
- 5. Spark plug voltage.

F. Engine Cooling System: Thermostat calibration.

G. Exhaust Emission Control system.

- 1. Air injection system.
 - a. Control parameters and calibrations.
 - b. EGR valve flow calibration.
- 2. EGR system.
 - a. Control parameters and calibrations.
 - b. EGR valve flow calibration.
- 3. Catalytic converter system.
 - a. Active surface area.
 - b. Volume of catalyst.
 - c. Conversion efficiency.
 - d. Leaded fuel restrictor or constricted fuel filler neck.
- 4. Backpressure.

H. Evaporative Emission Control System.

- 1. Control parameters and calibrations.

- 2. Fuel tank.
 - a. Pressure and vacuum relief settings.
 - b. Fuel fill pipe and opening specifications (Reference section 2290, Title 13, C.C.R.).
- I. Crankcase Emission Control System.
 - 1. Control parameters and calibrations.
 - 2. Valve calibration(s).
- J. Auxiliary Emission Control Devices (AECD).
 - 1. Control parameters and calibrations.
 - 2. Component calibration(s).
- K. Emission Control Related Malfunction and Diagnostic Systems.
 - 1. On-Board Malfunction and Diagnostic Systems
 - a. Control parameters and calibrations.
 - b. Component calibration(s).
 - 2. Emission Control Related Warning Systems
 - a. Control parameters and calibrations.
 - b. Component calibration(s).
- L. Driveline Parameters.
 - 1. Axle ratio(s).
- II. Heavy-Duty Gasoline Engine Parameters and Specifications.
 - A. Basic Engine Parameters.
 - 1. Compression ratio.
 - 2. Cranking compression pressure.
 - 3. Supercharger/turbocharger calibration.
 - 4. Valves (intake and exhaust).
 - a. Head diameter dimension.
 - b. Valve lifter or actuator type and valve lash dimension.
 - 5. Camshaft timing.
 - a. Valve opening (degrees BTDC).
 - b. Valve closing (degrees ATDC).

c. Valve overlap (inch-degrees).

B. Air Inlet System: Temperature control system calibration.

C. Fuel System.

1. General.

a. Engine idle speed.

b. Engine idle mixture.

2. Carburetion.

a. Air-fuel flow calibration.

b. Transient enrichment system calibration.

c. Starting enrichment system calibration.

d. Altitude compensation system calibration.

e. Hot idle compensation system calibration.

3. Fuel injection.

a. Control parameters and calibrations.

b. Fuel shutoff system calibration.

c. Starting enrichment system calibration.

d. Transient enrichment system calibration.

e. Air-fuel flow calibration.

f. Altitude compensation system calibration.

g. Operating pressure(s).

h. Injector timing calibrations.

D. Ignition System.

1. Control parameters and calibrations.

2. Initial timing setting.

3. Dwell setting.

4. Altitude compensation system calibration.

5. Spark plug voltage.

E. Engine Cooling System: Thermostat calibration.

F. Exhaust Emission Control system.

1. Air injection system.

- a. Control parameters and calibrations.
 - b. Pump flow rate.
- 2. EGR system.
 - a. Control parameters and calibrations.
 - b. EGR valve flow calibration.
- 3. Catalytic converter system.
 - a. Active surface area.
 - b. Volume of catalyst.
 - c. Conversion efficiency.
 - d. Leaded fuel restrictor or constricted fuel filler neck.
- 4. Backpressure.
- G. Evaporative Emission Control System.
 - 1. Control parameters and calibrations.
 - 2. Fuel tank.
 - a. Pressure and vacuum relief settings.
 - b. Fuel fill pipe and opening specifications (Reference section 2290. Title 13, C.C.R.).
- H. Crankcase Emission Control System.
 - 1. Control parameters and calibrations.
 - 2. Valve calibration(s).
- I. Auxiliary Emission Control Devices (AECD).
 - 1. Control parameters and calibrations.
 - 2. Component calibration(s).
- J. Emission Control Related Warning Systems.
 - 1. Control parameters and calibrations.
 - 2. Component calibration(s).
- III. Heavy-Duty Diesel Engine and Off-Road Compression-Ignition Engine Parameters and Specifications.
 - A. Basic Engine Parameters-Four Stroke Cycle Reciprocating Engines.
 - 1. Compression ratio.

2. Cranking compression pressure.
3. Supercharger/turbocharger calibration.
4. Valves (intake and exhaust).
 - a. Head diameter dimension.
 - b. Valve lifter or actuator type and valve lash dimension.
5. Camshaft timing.
 - a. Valve opening (degrees BTDC).
 - b. Valve closing (degrees ATDC).
 - c. Valve overlap (inch-degrees).
- B. Basic Engine Parameters-Two Stroke Cycle Reciprocating Engine.
 - 1-5. Same as section III.A.
 6. Intake port(s): Timing in combustion cycle.
 7. Exhaust port(s): Timing in combustion cycle.
- C. Air Inlet System: Temperature control system calibration.
 1. Temperature control system calibration.
 2. Maximum allowable air inlet restriction.
- D. Fuel System.
 1. Fuel injection.
 - a. Control parameters and calibrations.
 - b. Transient enrichment system calibration.
 - c. Air-fuel flow calibration.
 - d. Altitude compensation system calibration.
 - e. Operating pressure(s).
 - f. Injector timing calibration.
- E. Exhaust Emission Control System: Maximum allowable backpressure.
- F. Crankcase Emission Control System.
 1. Control parameters and calibrations.
 2. Valve calibration(s).
- G. Auxiliary Emission Control Device (AECD).
 1. Control parameters and calibrations.

2. Component calibration(s).

NOTE: Authority cited: Sections 38501, 38505, 38510, 38560, 39010, 39600, 39601, 43013, 43018, 43101, 43104, 43105 and 43806, Health and Safety Code; and Section 28114, Vehicle Code. Reference: Sections 38501, 38505, 38510, 38560, 39002, 39003, 39010, 39500, 39601, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43202, 43204-43205.5, 43206, 43210, 43211, 43212, 43213 and 43806, Health and Safety Code; and Section 28114, Vehicle Code.

Title 13, California Code of Regulations

Adopt Section 2139.0.1 of title 13, California Code of Regulations, to read as follows:

§ 2139.0.1 Testing. (Alternative)

After the vehicles or trailers have been accepted and restorative maintenance, if any, has been performed, the ARB or its designated laboratory shall perform the applicable emission tests pursuant to the following:

- (a) For passenger cars and light-duty trucks, in-use compliance emission tests shall be performed pursuant to section 1960.1, 1961, 1961.2, or 1961.3, Title 13, California Code of Regulations, as applicable.
- (b) For medium-duty vehicles certified according to the chassis standards and test procedures specified in section 1960.1, 1961, 1961.2, or 1961.3, Title 13, California Code of Regulations and the documents incorporated by reference therein, in-use compliance emission tests shall be performed pursuant to section 1960.1, 1961, 1961.2, or 1961.3, Title 13, California Code of Regulations, as applicable.

For medium-duty vehicles certified according to the Greenhouse Gas emission standards of section 95663, Title 17, California Code of Regulations, and the documents incorporated by reference therein, in-use compliance emission tests shall be performed pursuant to section 95663, Title 17, California Code of Regulations, as applicable.

- (c) For medium-duty engines and vehicles certified according to the optional engine test procedures specified in section 1956.8, Title 13, California Code of Regulations and the documents incorporated by reference therein, in-use compliance emission tests shall be performed pursuant to one of the following procedures:
 - (1) The engines of medium-duty vehicles may be tested pursuant to the engine test procedures specified in section 1956.8, provided that the manufacturer or its designated laboratory conduct procurement and enforcement testing pursuant to Sections 2136 through 2140, Title 13, California Code of Regulation, at the manufacturer's expense.

For manufacturers that have only one engine family or test group, the manufacturer or its designated laboratory that have more than one engine family or test group, the manufacturer or its designated laboratory shall procure no more than fifteen vehicles per engine family or test group. For manufacturers that have more than one engine family or test group, the manufacturer or its designated laboratory shall procure and test at the manufacturer's expense no more than one-third of its engine families or test groups and no more than fifteen vehicles from each engine family or test group. For the purposes of this section, "one-third" of a manufacturer's engine families or test groups shall be determined by dividing the number of distinct engine families or test groups by three, adding 0.5, and truncating the result to the nearest whole number.

The specific engine families or test groups subject to enforcement testing shall be selected by the ARB. The manufacturer or its designated laboratory shall begin the engine procurement process within 10 working days of notification by the ARB and shall complete testing within 100 working days of notification by the ARB. The Executive Officer shall approve the manufacturer's procurement procedures in advance of their use by the manufacturer. The Executive Officer shall approve a manufacturer's procurement procedures if engines are screened according to the criteria specified in section 2137, Title 13, California Code of Regulations and selected randomly from registration records compiled and prepared by R. L. Polk and Company or a comparable source. In addition, no vehicle shall be selected for enforcement testing with mileage less than 60 percent of the useful-life mileage without prior approval from the Executive Officer. The manufacturer shall permit an ARB representative to witness procurement, restorative maintenance, and enforcement testing. The Executive Officer shall have the authority to accept or reject a test engine based upon criteria specified in section 2137. Once an engine has been tested and determined to be in compliance with the current in-use emission standards, no further testing will be performed on subsequent engine families or test groups that carry-over the durability data of the tested engine family or test group.

Notwithstanding the above, if a manufacturer fails to demonstrate compliance with the emission standards after one-third of its engine families or test groups have been tested, additional engine families or test groups shall be tested, by the manufacturer or its designated laboratory, at the manufacturer's expense, until compliance is demonstrated on one-third of the engine families or test groups or all of a manufacturer's engine families or test groups have been tested. In addition, any engine family or test group which has been tested and determined to be in noncompliance shall be retested by the manufacturer each subsequent year until compliance with the applicable emission standards has been demonstrated. Notwithstanding the above, the ARB may conduct engine enforcement testing pursuant to the engine test procedures specified in section 1956.8, at their own expense.

- (2) Medium-duty vehicles may be tested according to the chassis test procedures specified in section 1960.1(k), 1961, or 1961.2, Title 13, California Code of Regulations or section 95663, Title 17, California Code of Regulations, as applicable, if a manufacturer develops correlation factors which establish the relationship between engine and chassis testing for each engine family or test group and submits these correlation factors within one year after the beginning of production. The correlation factors shall be applied to the measured in-use engine exhaust emission data to determine the in-use engine exhaust emission levels. All correlation factors and supporting data included in a manufacturer's application must be submitted to and approved by the Executive Officer in advance of their use by a manufacturer. Correlation factors intended to apply to a specific engine family or test group shall be applicable for each vehicle model incorporating that specific engine. Manufacturers shall submit test data demonstrating the applicability of the correlation factors for vehicle models comprising a minimum of 80 percent of their engine sales for that specific engine family or test group. The correlation factors for the remaining fleet may be determined through an engineering evaluation based upon a comparison with similar vehicle models. The Executive Officer shall approve a submitted correlation factor if it accurately corresponds to other established empirical and theoretical correlation factors and to emission test data available to the Executive Officer.

A manufacturer may choose to use the results from the chassis in-use testing as a screening test. If an engine family or test group does not demonstrate compliance with any of the applicable in-use engine standards, as determined from the chassis test data and the applied correlation factors, the manufacturer shall be subject to the requirements and cost of in-use compliance engine testing, as specified in section 2139(c)(1). The manufacturer shall be subject to engine testing for any non-complying engine family or test group for each subsequent year until compliance with the engine emission standards is demonstrated.

Subsequent to approval of the correlation factors, the Executive Officer may make a determination that the original correlation factors are not valid. Such a determination may be based upon in-use emission data, including chassis and engine testing. Upon determination that the correlation factors for a specific engine family or test group are not valid, the manufacturer of the engine family or test group shall be subject to the enforcement testing requirements and costs of in-use compliance engine testing, as specified in section 2139(c)(1).

- (3) The manufacturer shall choose one of the procedures specified in subsections (c)(1) through (c)(2). The Executive Officer shall permit the use of alternative test procedures if the Executive Officer determines the alternative test procedure adequately predicts the exhaust emissions from the engine test procedure specified in section 1956.8, Title 13, California Code of Regulations. Such a determination may be based upon correlation with test data from the engine test procedures.
 - (4) The time limits specified in subsections (c)(1) and (c)(2) may be extended by the Executive Officer if the manufacturer demonstrates that the time limits specified could not be achieved due to reasons beyond the reasonable control of the manufacturer.
- (d) For heavy-duty engines and vehicles, in-use compliance emission tests shall be performed pursuant to section 1956.8, title 13, California Code of Regulations, "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" incorporated by reference in title 13, California Code of Regulations, section 1956.8(b), and "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles" incorporated by reference in title 13, California Code of Regulations, section 1956.8(d). For heavy-duty vehicles and trailers certified to the GHG emission standards of section 95663, title 17, California Code of Regulations, in-use compliance emission tests shall be performed pursuant to section 95663, Title 17, California Code of Regulations.
 - (e) For motorcycles, in-use compliance emission tests shall be performed pursuant to section 1958, title 13, California Code of Regulations.
 - (f) For off-road motorcycles and all-terrain vehicles, in-use compliance tests shall be performed pursuant to section 2412, title 13, California Code of Regulations. The in-use compliance testing shall use the same test procedure utilized for the specific vehicle's original certification testing.

- (g) For off-road compression-ignition engines, in-use compliance tests shall be performed pursuant to section 2423, title 13, California Code of Regulations. The in-use compliance testing shall use the same test procedure utilized for the specific engine's original certification testing.
- (h) For spark-ignition sterndrive/inboard marine engines, in-use compliance tests shall be performed pursuant to section 2442, title 13, California Code of Regulations. The in-use compliance testing shall use the same test procedure utilized for the specific engine's original certification testing.
- (i) For any emission in-use compliance test performed pursuant to subsections (a) through (h), the ARB may waive a specific test for subsequent vehicle or trailer samples if results from vehicle or trailer samples already tested are deemed sufficient to establish complying emission levels. The ARB shall inform the manufacturer at least 30 days prior to enforcement testing of its vehicles, engines, or trailers and shall permit a manufacturer representative to observe the enforcement testing.

Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38560, 39002, 39003, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43103, 43104, 43105, 43106, 43107, 43204-43205.5 and 43211-43213, Health and Safety Code.

Title 13, California Code of Regulations

Adopt Section 2140.0.1 of title 13, California Code of Regulations, to read as follows:

§ 2140.0.1 Notification and Use of Test Results. (Alternative)

- (a) The Executive Officer shall notify the manufacturer in writing if the in-use vehicle or trailer enforcement test results indicate that the test fleet contains three or more failures of the same emission-related component. Upon receipt of the notification, the manufacturer shall submit an emissions information report in accordance with title 13, California Code of Regulations, sections 2146 and 2147. The engine family, test group, vehicle family, trailer family, or sub-group manufacturer shall be subject to recall when a specific emission-related failure occurred in three or more test vehicles or trailers, unless the Executive Officer determines from the emissions information report that a recall is unnecessary.
- (b) If the results of the in-use vehicle or trailer emission tests conducted pursuant to section 2139 indicate that the average emissions of the test vehicles or trailers for any pollutant exceed the applicable emission standards specified in title 13, California Code of Regulations, sections 1960.1, 1961, 1961.2, 1961.3, 1956.8, 1958, 2412, 2423 or 2442, or in title 17, California Code of Regulations, section 95663, the entire vehicle or trailer population so represented shall be deemed to exceed such standards. The Executive Officer shall notify the manufacturer of the test results and upon receipt of the notification, the manufacturer shall have 45 days to submit an influenced recall plan in accordance with sections 2113 through 2121, title 13, California Code of Regulations. If no such recall plan is submitted, the Executive Officer may order corrective action including recall of the affected vehicles or trailers in accordance with sections 2122 through 2135, title 13, California Code of Regulations.
- (c) For purposes of determining compliance with the test procedures in title 13, California Code of Regulations, section 2139.5, an engine family is considered a failure if any of the following conditions occur:
 - (1) for diesel engines, at least three vehicles tested exceed the three-bin moving average window (3B-MAW) in-use threshold for the same bin and pollutant.
 - (2) for diesel engines, the arithmetic mean of the Sum-Over-Sum emissions defined in "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" 40 CFR section 86.1370.B.6.6, calculated across the 10 tested vehicles for each individual pollutant and bin, exceed the in-use threshold.
 - (3) for Otto-cycle engines, at least three vehicles tested exceed the moving average window (MAW) in-use threshold for the same pollutant.

- (4) for Otto-cycle engines, the arithmetic mean of the Sum-Over-Sum emissions defined in “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles” 40 CFR section 86.1370.B.1.4 and section 86.1370.B.1.5 (if applicable), calculated across the 10 test vehicles for each individual pollutant, exceed the in-use threshold.

Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39600, 39601, 43013, 43018 and 43105, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, 43204-43205.5 and 43211-43213, Health and Safety Code.

Title 13, California Code of Regulations

Adopt Section 2147.0.1 of title 13, California Code of Regulations, to read as follows:

§ 2147.0.1 Demonstration of Compliance with Emission Standards. (Alternative)

- (a) In order to overcome the presumption of noncompliance set forth in title 13, California Code of Regulations, section 2123(b), the average emissions of the vehicles, engines, and trailers with the failed emission-related component must comply with applicable emission standards. A manufacturer may demonstrate compliance with the emission standards by following the procedures set forth in either subsection (b) or subsection (c) of this section.
- (b) A manufacturer may test properly maintained in-use vehicles and trailers with the failed emission-related component pursuant to the applicable certification emission tests specified in title 13, California Code of Regulations, section 1960.1, 1961, 1961.2, 1961.3, or 1961.4, as applicable, for passenger cars, light-duty trucks, and medium-duty vehicles, section 1956.8 for heavy-duty engines and vehicles, section 1958 for motorcycles, and section 2442 for sterndrive/inboard marine engines, and in title 17, California Code of Regulations, section 95663, for heavy-duty vehicles and trailers. The emissions shall be projected to the end of the vehicle's or engine's useful life using in-use deterioration factors. The in-use deterioration factors shall be chosen by the manufacturer from among the following:
 - (1) "Assigned" in-use deterioration factors provided by the ARB on a manufacturer's request and based on ARB in-use testing; or,
 - (2) deterioration factors generated during certification, provided adjustments are made to account for vehicle aging, customer mileage-accumulation practices, type of failed component, component failure mode, effect of the failure on other emission-control components, commercial fuel and lubricant quality, and any other factor which may affect the vehicle's or engine's operating conditions; or,

- (3) subject to approval by the Executive Officer, a manufacturer-generated deterioration factor. The Executive Officer shall approve such deterioration factor if it is based on in-use data generated from certification emission tests performed on properly maintained and used vehicles in accordance with the procedures set forth in section 1960.1, 1961, 1961.2, or 1961.4 of title 13 of the California Code of Regulations, as applicable, for passenger cars, light-duty trucks, and medium-duty vehicles; section 1956.8 of title 13 of the California Code of Regulations heavy duty vehicles and engines; and section 1958 of title 13 of the California Code of Regulations for motorcycles; and section 95663 of title 17 of the California Code of Regulations, for heavy-duty vehicles, and if the vehicles from which it was derived are representative of the in-use fleet with regard to emissions performance and are equipped with similar emission control technology as vehicles with the failed component.
- (c) In lieu of the vehicle, engine, or trailer emission testing described in subsection (b) above and subject to prior written approval by the Executive Officer, a manufacturer may perform an engineering analysis, laboratory testing or bench testing, when appropriate, to demonstrate the effect of the failure.

Note: Authority cited: Sections 38501, 38505, 38510, 38560, 39500, 39600, 39601, 43000.5, 43013, 43018, 43105, 43204, 43205.5 and 43214 Health and Safety Code.
Reference: Sections 38501, 38505, 38510, 38560, 43000, 43009.5, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

Title 13, California Code of Regulations

Adopt Section 2317.0.1 of title 13, California Code of Regulations, to read as follows:

§ 2317.0.1 Satisfaction of Designated Clean Fuel Requirements with a Substitute Fuel. (Alternative)

- (a) Any person may petition the state board to designate by regulation a substitute fuel which may be used instead of a primary designated clean fuel to satisfy any requirements in this chapter pertaining to a designated clean fuel. The state board shall designate such a substitute fuel if it is satisfied that the petitioner has demonstrated all of the following:
 - (1) That use of the fuel in low-emission vehicles certified on the primary designated clean fuel will result in emissions of NMOG (on a reactivity-adjusted basis), NO_x, and CO no greater than the corresponding emissions from such vehicles fueled with the primary designated clean fuel, as determined pursuant to the procedures set forth in the “California Test Procedure for Evaluating Substitute Fuels and New Clean Fuels through 2014,” as amended March 22, 2012 or the “California Test Procedure for Evaluating Substitute Fuels and New Clean Fuels in 2015 and Subsequent Years,” as adopted March 22, 2012 as applicable, which are incorporated herein by reference.
 - (2) That use of the fuel in low-emission vehicles certified on the primary designated clean fuel will result in potential health risks from exposure to benzene, 1,3-butadiene, formaldehyde, and acetadehyde in the aggregate no greater than the corresponding potential health risks for such vehicles fueled with the primary designated clean fuel, as determined pursuant to the procedures set forth in the “California Test Procedure for Evaluating Substitute Fuels and New Clean Fuels through 2014” or the “California Test Procedure for Evaluating Substitute Fuels and New Clean Fuels in 2015 and Subsequent Years,” as applicable, which are incorporated herein by reference.
 - (3) That if the proposed substitute fuel may be used to fuel any motor vehicle other than low-emission vehicles certified on the primary designated clean fuel:
 - (A) Use of the substitute fuel in such other motor vehicles would not increase emissions of NMOG (on a reactivity-adjusted basis), NO_x, and CO as determined pursuant to the procedures set forth in the “California Test Procedure for Evaluating Substitute Fuels and New Clean Fuels through 2014” or the “California Test Procedure for Evaluating Substitute Fuels and New Clean Fuels in 2015 and Subsequent Years,” as applicable, which are incorporated herein by reference; and

- (B) Use of the substitute fuel in such other motor vehicles would result in potential health risks from exposure to benzene, 1,3-butadiene, formaldehyde, and acetadehyde in the aggregate no greater than the corresponding potential health risk from the emissions from such vehicles when operating on their customary fuel, as determined pursuant to the procedures set forth in the “California Test Procedure for Evaluating Substitute Fuels and New Clean Fuels through 2014” or the “California Test Procedure for Evaluating Substitute Fuels and New Clean Fuels in 2015 and Subsequent Years,” as applicable, which are incorporated herein by reference; and
 - (C) Use of the substitute fuel in such other motor vehicles would not result in increased deterioration of the emission control system on the vehicle and would not void the warranties of any such vehicles.
- (b) Whenever the state board designates a substitute fuel pursuant to this section, the state board shall also establish by regulation required specifications for the substitute fuel.
- (c) Commencing with the effective date of a regulatory action of the state board designating a substitute fuel pursuant to this section, any person may satisfy his or her obligations under this chapter pertaining to a primary designated clean fuel, in whole or in part, by substituting the substitute fuel in place of the primary designated clean fuel.

NOTE: Authority cited: Sections 39600, 39601, 39667, 43013, 43018 and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975). Reference: Sections 39000, 39001, 39002, 39003, 39500, 39515, 39516, 39667, 43000, 43013, 43018 and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975).

Title 13, California Code of Regulations

Adopt Section 2903.0.1 of title 13, California Code of Regulations, to read as follows:

§ 2903.0.1 Definitions (Alternative)

The following definitions shall govern the provisions of this Article 2.

“Aerodynamic technologies” is defined in Title 17, section 95302 and is used to comply with the requirements of the “California Greenhouse Gas Exhaust Emission Standards and Test Procedures for 2014 and Subsequent Model Heavy-Duty Vehicles,” incorporated by reference in Title 17, section 95663, subsection (d).

“Engine family” is a basic classification unit that is used to demonstrate compliance with Title 13, section 1956.8.

“Evaporative emissions family” is a basic classification unit that is used to demonstrate compliance with Title 13, section 1976.

“Family emission limit (FEL)” is defined in Title 13, section 1956.8.

“Fuel-fired heater” means any idling emission reduction device subject to the certification requirements in Title 13, sections 1956.8 and 2485, subsection (c)(3)(B).

“Heavy-duty compression ignition (HD CI) engine family” means any heavy-duty compression ignition engine family subject to the heavy-duty engine certification requirements in Title 13, section 1956.8 that apply to: heavy-duty diesel engines, heavy-duty natural gas-fueled and liquefied-petroleum-gas-fueled engines derived from diesel-cycle engines, and heavy-duty methanol-fueled diesel engines.

“Heavy-duty Otto-cycle (HDO) engine family” means any heavy-duty Otto-cycle engine family subject to the heavy-duty engine certification requirements in Title 13, section 1956.8.

“Heavy-duty greenhouse gas vehicle family” means any heavy-duty vehicle family subject to the requirements of the “California Greenhouse Gas Exhaust Emission Standards and Test Procedures for 2014 and Subsequent Model Heavy-Duty Vehicles,” incorporated by reference in Title 17, section 95663, subsection (d).

“Heavy-duty greenhouse gas (HD GHG) partial carry-over” means an application that is identical to the previous model year's application that resulted in the issuance of an certification except for one or more of the following: (1) model year; (2) Engine or Vehicle family name; (3) applicant contact information; (4) projected sales data; and in addition one or more of the following: 5) model names (only if the CO₂ standard to which the vehicle is certified or the lowest and highest FELs are not changed); (6) part numbers (only if the CO₂ standard to which the vehicle is certified or the lowest and highest FELs are not changed); (7) Engine families, transmission families, powertrain families, and axle families (only if the CO₂ standard to which the vehicle is certified or the lowest and highest FELs are not changed); and (8) Tires (for design-based standards only, tire changes must not impact the worst case coefficient of rolling resistance).

“Heavy-duty vehicle evaporative emissions family” means any heavy-duty vehicle family subject to the certification requirements in Title 13, sections 1976 and 1978.

“Incomplete medium-duty vehicle” means any medium-duty vehicle that meets the definition of an “incomplete vehicle” in the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” incorporated by reference in Title 13, section 1961.2, and is subject to the emission standards in Title 13, section 1956.8.

“Incomplete medium-duty vehicle (MDV) evaporative emissions family” means any medium-duty evaporative emissions family that is incorporated in an incomplete medium-duty vehicle.

“Light-duty vehicle” means any passenger car or light-duty truck that meets the applicable definitions in Title 13, section 1900 and is subject to the certification requirements in Title 13, Division 3, Chapter 1, Article 2. A street-use motorcycle is not a light-duty vehicle.

“Low California production manufacturer” means a manufacturer that produces annually for sale in California a total of no more than 300 heavy-duty vehicles that certify to the heavy-duty greenhouse gas standards in Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 12 or a total of no more than 300 street-use motorcycles and motorcycle engines. The annual number of units produced for sale in California for purposes of this definition shall be based on the average number of applicable heavy-duty vehicles or street-use motorcycles or motorcycle engines produced for sale in California for the three previous consecutive model years by the manufacturer that seeks certification as a low California production manufacturer. For manufacturers seeking certification for the first time in California, model-year production volume shall be based on projected California sales. If actual reported sales numbers are available, projected production of California sales cannot be used to determine compliance with this definition.

1) For heavy-duty vehicles that certify to the heavy-duty greenhouse gas standards, the production cap is 300 units based on final sales data reported in accordance with section 1037.250 of the “California Greenhouse Gas Exhaust Emission Standards and Test Procedures for 2014 and Subsequent Model Heavy-Duty Vehicles,” incorporated by reference in Title 17, section 95663, subsection (d). If final sales data is not available, projected sales data reported in accordance with section 1037.205 of the procedures shall be used to determine eligibility under this definition.

2) For street-use motorcycles and motorcycle engines, the production cap is 300 units based on final annual production for sale volume reports submitted in accordance with Title 40, Code of Federal Regulations, Part 86, section 86.415-78, incorporated in Title 13, section 1958, subsection (c) or projected production for sale data reported in accordance with Title 40, Code of Federal Regulations, Part 86, section 86.416-80, incorporated in Title 13, section 1958, subsection (c), if final sales data is not available.

“Low California production for sale engine family” means a street-use motorcycle family or street-use motorcycle engine family with a maximum of 100 units. The maximum allowable number of units shall be calculated based on the final annual production for sale volume reports submitted in accordance with Title 40, Code of Federal Regulations, Part 86, section 86.415-78, incorporated in Title 13, section 1958, subsection (c) or projected production for sale data reported in accordance with Title 40, Code of Federal Regulations, Part 86, section 86.416-80, incorporated in Title 13, section 1958, subsection (c), if final sales data is not available.

The number of “low California production for sale engine family” applications that a manufacturer may submit for each model year is based on the average total number of units that manufacturer produced for sale in California for the three previous consecutive model years. For manufacturers seeking certification for the first time in California, model-year production volume shall be based on projected California sales.

1) A manufacturer that produced for sale in California more than an average of 2,500 total units for the previous three model years may submit no more than three “low California production for sale engine family” applications for each model year and may not use the low California production manufacturer provision for any other applications of the same model year.

2) A manufacturer that produces for sale in California an average of 2,500 or fewer total units for the previous three model years may submit up to six “low California production for sale engine family” applications for each model year and may not use the low California production manufacturer provision for any other applications of the same model year.

“Medium-duty compression ignition (MD CI) engine family” means any engine family subject to the medium-duty compression ignition engine certification requirements in Title 13, section 1956.8.

“Medium-duty Otto-cycle (MDO) engine family” means any engine family subject to the medium-duty Otto-cycle engine certification requirements in Title 13, section 1956.8.

“Medium-duty vehicle” means any vehicle that meets the definition of a medium-duty vehicle (including medium-duty passenger vehicles) in Title 13, section 1900 and is subject to the certification requirements in Title 13, Division 3, Chapter 1, Article 2.

“On-road heavy-duty exempt engine” means a federally-certified heavy-duty engine that can legally be sold in California under the provisions of Title 13, section 1956.8, subdivision (f).

“Specially constructed vehicle (SPCNS) certified engine package” is a “certified engine package,” as defined in Title 13, section 2211, that is subject to the certification requirements in Title 13, section 2212.

“Specially constructed vehicle (SPCNS) certified engine package extension” is a “SPCNS certified engine package,” that complies with the requirements in Title 13, section 2209.2, subsection (b).

“Specially produced motor vehicle (SPMV) certified engine package” is a “certified engine package,” as defined in Title 13, section 2209.1, that is subject to the certification requirements in Title 13, section 2209.2.

“Specially produced motor vehicle (SPMV) manufacturer” is described in the “California Certification Procedures for Light-Duty Engine Packages for Use in New Light-Duty Specially-Produced Motor Vehicles for 2019 and Subsequent Model Years,” incorporated by reference in Title 13, section 2209.1.

“Street-use motorcycle or motorcycle engine” means any motorcycle or motorcycle engine subject to the certification requirements in Title 13, section 1958.

“Test group” is a basic classification unit that has the meaning given in the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures Passenger Cars, Light-Duty Trucks, and Medium Duty Vehicles,” incorporated by reference in Title 13, section 1961.2 subsection (d).

“Trailer Family” means any trailer family subject to the certification requirements in Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 12.

“Zero-emission powertrain family” means any zero-emission powertrain family subject to the certification requirements in the “California Standards and Test Procedures for New 2021 and subsequent Model Heavy-Duty Zero-Emission Powertrain,” incorporated by reference in Title 13, section 1956.8.

Note: Authority cited: Sections 39600, 39601, 43019, 43019.1, and 43202.6, Health and Safety Code. Reference: Sections 43000, 43000.5, 43013, 43018, 43019, and 43019.1, Health and Safety Code.

APPENDIX B-9

PROPOSED

California Environmental Protection Agency
AIR RESOURCES BOARD

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: March 22, 2012
Amended: December 6, 2012
Amended: May 30, 2014
Amended: September 2, 2015
Amended: September 3, 2015

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NOTE: This document is incorporated by reference in section 1962.2, title 13, California Code of Regulations (CCR). Additional requirements necessary to complete an application for certification of zero-emission vehicles and hybrid electric vehicles are contained in other documents that are designed to be used in conjunction with this document. These other documents include:

1. “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles” (incorporated by reference in section 1961.2, title 13, CCR);
2. “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles” (incorporated by reference in section 1976(c), title 13, CCR);
3. “California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles” (incorporated by reference in section 1978(b), title 13, CCR);
4. OBD II (section 1968, et seq. title 13, CCR, as applicable);
5. “California Environmental Performance Label Specifications for 2009 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles” (incorporated by reference in 1965, title 13, CCR);
6. Warranty Requirements (sections 2037 and 2038, title 13, CCR);
7. “Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks” (incorporated by reference in section 2235, title 13, CCR);
8. Guidelines for Certification of Federally Certified Light-Duty Motor Vehicles for Sale in California (incorporated by section 1960.5, title 13, CCR); and
9. “California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent Model Years,” (incorporated by reference in section 1961.2(d), title 13, CCR).

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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**

A. Applicability

The emission standards and test procedures in this document are applicable to 2018 and subsequent model-year zero-emission passenger cars, light-duty trucks, and medium-duty vehicles, and 2018 and subsequent model-year hybrid electric passenger cars, light-duty trucks, and medium-duty vehicles. The general procedures and requirements necessary to certify a vehicle for sale in California are contained in the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles” (hereinafter “LDV/MDV TPs”), and apply except as amended herein.

B. Definitions and Terminology.

1. Definitions.

In addition to the following, these test procedures incorporate by reference the definitions and abbreviations set forth in the Title 40 Code of Federal Regulations (CFR) §86.1803-01, the definitions and abbreviations set forth in the LDV/MDV TPs, and the definitions set forth in section 1900, title 13, CCR.

“Advanced technology PZEV” or “AT PZEV” means any PZEV with an allowance greater than 0.2 before application of the PZEV early introduction phase-in multiplier.

“All-Electric Range” or “AER” means the total miles driven electrically (with the engine off) before the engine turns on for the first time, after the battery has been fully charged. The AER is defined in terms of the Urban All-Electric Range (AER_u) and the Highway All-Electric Range (AER_h).

“All-Electric Range Test” or “AERT” means a test sequence used to determine the range of an electric vehicle or of a hybrid electric vehicle without the use of its auxiliary power unit. The vehicle shall be tested for all-electric range in default mode or in normal mode if the vehicle does not have a default mode. The Urban All-Electric Range Test (AERT_u) determines the Urban All-Electric Range (AER_u) and the Highway All-Electric Range (AERT_h) determines the Highway All-Electric Range (AER_h) (see section G of these test procedures).

“Alternative Continuous Urban Test Schedule” means a series of the following sequence: UDDS, 10 minute key-off hot soak, UDDS, and 10-30 minute key-off hot soak. This alternative procedure may be substituted for the Continuous Urban Test Schedule when the Continuous Urban Test Schedule cannot be performed.

“Alternative Continuous Highway Test Schedule” means a series of the following sequence: HFEDS, 15 second key-on pause, HFEDS, and 10-30 minute key-off hot soak or a 15 second key-on pause. This alternative procedure may be substituted for the Continuous Highway Test Schedule when the Continuous Highway Test Schedule cannot be performed.

“Automotive-Related Global Revenue” means global net revenues in U.S. dollars derived from the sale of passenger cars, light-duty trucks, and medium-duty vehicles, as reported in the most recently available audited annual consolidated financial statements or reports. If these financial statements or reports are published using a currency other than U.S. dollars, the value of net revenues is to be converted to U.S. dollars using the average foreign exchange (FX) rate during the corresponding fiscal year as reported by USForex.

“Auxiliary power unit” or “APU” (also referred to as “engine”) means a device that converts consumable fuel energy into mechanical or electrical energy. Some examples of auxiliary power units are internal combustion engines, gas turbines, or fuel cells. For the purposes of range extended battery electric vehicles, auxiliary power unit means any device that provides electrical or mechanical energy, meeting the requirements of subdivision C.3.2, to a BEVx, after the zero emission range has been fully depleted. A fuel fired heater does not qualify under this definition for an APU.

“Battery electric vehicle” or “BEV” means any vehicle that operates solely by use of a battery or battery pack, or that is powered primarily through the use of an electric battery or battery pack but uses a flywheel or capacitor that stores energy produced by the electric motor or through regenerative braking to assist in vehicle operation.

“Battery or Battery pack” means any electrical energy storage device consisting of any number of individual battery modules or cells that is used to propel a battery electric or hybrid electric vehicle. These terms may also generically refer to capacitor and flywheel energy storage devices in the context of hybrid electric vehicles.

“Battery state-of-charge” means the quantity of electrical energy remaining in the battery relative to the maximum rated capacity of the battery expressed in percent.

“Blended off-vehicle charge capable hybrid electric vehicle” means an off-vehicle charge capable hybrid electric vehicle that uses the engine to supplement battery/electric motor power during charge depleting operation.

“Blended operation mode” means an operating mode in which the energy storage state-of-charge decreases, on average, while the vehicle is driven and the engine is used occasionally to support power requests.

“Charge-depleting net energy consumption” means the net electrical energy, E_{cd} , measured in watt-hours consumed by vehicle over a charge depleting cycle range, R_{cdc} . E_{cd} can be expressed as AC or DC watt hours, where appropriate.

“Charge-depleting (CD) operation” means a type of vehicle operation in which the energy storage state-of-charge (SOC) may fluctuate but, on average, decreases while the vehicle is driven.

“Charge depleting actual range, urban” or “ R_{cdau} ” means the distance traveled on the Urban Charge Depleting Test Procedure at which the state-of-charge is first equal to the average state-of-charge of the two consecutive UDDS cycles used to end the Urban Charge Depleting Test Procedure. This range must be reported to the nearest 0.1 miles. (See section G.11.9.)

“Charge depleting actual range, highway” or “ R_{cdah} ” means the distance traveled on the Highway Charge Depleting Test Procedure at which the state-of-charge is first equal to the average state-of-charge of the HFEDS cycle used to end the Highway Charge Depleting Test Procedure. This range must be reported to the nearest 0.1 miles.

“Charge depleting cycle range” or “ R_{cdc} ” means the distance traveled on the Urban or Highway Charge Depleting Test Procedure up to the test cycle prior to where the state-of-charge is above the lower bound state-of-charge tolerance for one test cycle. This range will appear as the sum of a discrete number of test cycle distances. This range shall be reported to the nearest 0.1 miles. (See section F.11.8.)

“Charge-increasing operation” means a type of vehicle operation that occurs when the energy storage SOC may fluctuate but, on average, increases while the vehicle is driven over two or more consecutive UDDS cycles. To test PHEVs with charge-increasing operation, follow the test requirements for charge-sustaining operation in section G.5 with the modifications specific to charge-increasing operation. A charge-increasing driver-selectable mode is not included in this definition but is considered a mode and not an operation.

“Charge-sustaining net energy consumption” means the net electrical energy, Ecs, measured in watt-hours consumed by vehicle during charge sustaining operation. For charge sustaining operation, this number should be ~ 0.

“Charge-sustaining (CS) operation” means a type of vehicle operation in which the energy storage SOC may fluctuate but, on average, is maintained at a certain level while the vehicle is driven.

“Cold start UDDS” is defined as the first UDDS cycle in which the engine turns on.

“Consumable fuel” means any solid, liquid, or gaseous matter that releases energy when consumed by an auxiliary power unit.

“Continuous Highway Test Schedule” means a repeated series comprised of four consecutive key-on Highway Fuel Economy Driving Schedules (HFEDS) with a 15 second key-on pause in-between each HFEDS cycle. If this schedule cannot be performed continuously, a key-off soak up to 30 minutes is permitted after every fourth HFEDS cycle.

“Continuous Urban Test Schedule” means a repeated series comprised of an Urban Dynamometer Driving Schedules (UDDS), 40 CFR, Part 86, Appendix I, which is incorporated herein by reference; each test is followed by a 10 minute key-off soak period.

“Continuous US06 Test Schedule” means a repeated series of US06 driving schedules (US06) with a key-on idle period of not less than one minute and not greater than two minutes between each US06.

“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.

“Default Mode” means the operating mode to which the vehicle automatically reverts after a vehicle is turned off and subsequently turned on. A vehicle with default mode would require the driver to select an alternative mode each time the vehicle is turned on if the driver chooses to use an alternative mode.

“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).

“Driver-Selectable Mode” means an operating mode that the vehicle driver can manually engage by means of an instrument panel button, switch, screen menu, etc., anytime the vehicle is activated (e.g., when the key is in the on position).

“East Region pool” means the combination of Section 177 states east of the Mississippi River.

“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.

“Electric range fraction” means the fraction of electrical energy derived from off-vehicle charging and regenerative braking energy relative to total traction energy used over the charge depletion range on a specified drive cycle.

“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 operation. In the case of TZEVs, a minimum range threshold relative to certified, new-vehicle range capability is not specified or required.

“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.

“Equivalent all-electric range” or “EAER” means the portion of the total charge depleting range attributable to the use of electricity from the battery over a charge depleting test.

“Fuel cell vehicle” or “FCV” means any vehicle that receives propulsion solely from an onboard fuel cell power system.

“Fuel-fired heater” means a fuel burning device that creates heat for the purpose of warming the passenger compartment of a vehicle but does not contribute to the propulsion of the vehicle.

“Full State-of-Charge (SOC)” means the energy storage device of an off-vehicle charge capable hybrid electric vehicle is at full energy capacity following a recharging event with an off-vehicle charger.

“Grid-connected hybrid electric vehicle” means a hybrid electric vehicle that has the capacity for the battery to be recharged from an off-board source of electricity and has some all-electric range. This type of hybrid electric vehicle is also called a plug-in hybrid electric vehicle or PHEV.

“Highway Fuel Economy Driving Schedule” or “HFEDS” means highway fuel economy driving schedule. See 40 CFR Part 600 §600.109(b).

“Hybrid electric vehicle” or “HEV” means any vehicle that can draw propulsion energy from both of the following on-vehicle sources of stored energy: 1) a consumable fuel and 2) an energy storage device such as a battery, capacitor, or flywheel.

“Hybrid fuel cell vehicle” or “HFCV” means any vehicle that receives propulsion energy from both an onboard fuel cell power system and either a battery or a capacitor.

“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.

“Majority ownership situations” means when one manufacturer owns another manufacturer more than 33.4%, for determination of size under CCR Section 1900.

“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.

“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 (July 1, 2000), and is certified to zero-emission vehicle standards.

“NIST” means the National Institute of Standards and Technology.

“Normal Mode” means the operating mode where the vehicle automatically optimizes engine, battery, transmission, and braking operation for the most common driving conditions as determined by the manufacturer. Normal mode would be

equivalent to default mode if the vehicle has default mode.

“Off-vehicle charge capable” means having the capability to charge a battery from an off-vehicle electric energy source that cannot be connected or coupled to the vehicle in any manner while the vehicle is being driven. A grid-connected hybrid electric vehicle is one example of an off-vehicle charge capable hybrid electric vehicle.

“Placed in service” means having been sold or leased to an end-user and not just to a dealer or other distribution chain entity, and having been individually registered for on-road use by the California Department of Motor Vehicles.

“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.

“Partial Zero Emission Vehicle” or “PZEV” means any vehicle that is delivered for sale in California and that qualifies for a partial ZEV allowance of at least 0.2, under section 1962.1.

“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 C.4.5(g),

“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.

“SAE J1634” means the “Battery Electric Vehicle Energy Consumption and Range Test Procedure,” as revised by SAE International in August, 2025-October, 2012.

“SAE J1711” means the “Recommended Practice for Measuring the Exhaust Emissions and Fuel Economy of Hybrid-Electric Vehicles, Including Plug-in Hybrid Vehicles,” as revised by SAE International in February, 2023-June, 2010.

“SAE J2572” means the “Recommended Practice for Measuring Fuel Consumption and Range of Fuel Cell and Hybrid Fuel Cell Vehicles Fuelled by Compressed Gaseous Hydrogen,” as published by the Society of Automotive Engineers in October, 2008.

“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).

“SC03” means the U.S. EPA SC03 driving schedule representing vehicle operation with air conditioning, as set forth in Appendix I of 40 CFR Part 86.

“State of Charge (SOC) Net Energy Change Tolerance” means the state-of-charge net energy change tolerance that is applied to the SOC Criterion for charge-sustaining hybrid electric vehicles when validating an emission test. See section F.9 and G.10 of these procedures for tolerance specifications.

“State of Charge (SOC) Criterion” means the state-of-charge criterion that is applied to a charge-sustaining hybrid electric vehicle to validate an emission test. The SOC Criterion requires that no net change in battery energy occurs over a given test cycle, i.e. the final battery state-of-charge that is recorded at the end of the emission test must be equivalent to the initial battery state-of-charge that is set at the beginning

of the emission test. The SOC Net Energy Change Tolerance shall be applied to the SOC Criterion.

“Transitional Zero Emission Vehicle” or “TZEV” means a vehicle that meets all the criteria of subdivision C.3.2 and qualifies for an allowance in subdivision C.3.3(a) or (e).

“UDDS” means urban dynamometer driving schedule as set forth in Appendix I of 40 CFR Part 86.

“US06” means the US06 driving schedule for aggressive driving as set forth in Appendix I of 40 CFR Part 86.

“West Region pool” means the combination of Section 177 states west of the Mississippi River.

“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.

“Zero-emission Vehicle Miles Traveled” or “zero emission VMT” means the vehicle miles traveled with zero exhaust emissions of any criteria pollutant (or precursor pollutant).

“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.

2. Terminology.

	Abbreviation	Units
Charge Depleting Net Energy Consumption	E_{cd}	wh
Charge Depleting CO ₂ Produced	M_{cd}	g/mi
Charge Sustaining CO ₂ Produced	M_{cs}	g/mi
Highway All-Electric Range	AER_h	mi
Highway Charge Depleting Actual Range	R_{cdah}	mi
Highway Charge Depleting Cycle Range	R_{cdch}	mi
Highway Charge Depleting to Charge Sustaining Range	R_{cdcsH}	mi
Highway Electric Range Fraction	ERF_h	%
Highway Equivalent All-Electric Range	$EAER_h$	mi
Highway Equivalent All-Electric Range Energy Consumption	$EAEREC_h$	wh/mi
Urban All-Electric Range	AER_u	mi
Urban Charge Depleting Actual Range	R_{cdau}	mi
Urban Charge Depleting Cycle Range	R_{cdcu}	mi
Urban Charge Depleting to Charge Sustaining Range	R_{cdcsu}	mi

Urban Electric Range Fraction	ERF_u	%
Urban Equivalent All-Electric Range	$EAER_u$	mi
Urban Equivalent All-Electric Range scaled to 40 mi limit	$EAER_{u40}$	mi
Urban Equivalent All-Electric Range Energy Consumption	$EAEREC_u$	wh/mi

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.~~[Reserved]

2.1 ~~General Percentage ZEV Requirement.~~

~~(a) **Basic Requirement.** The minimum percentage ZEV requirement for each manufacturer is listed in the table below as the percentage of the PCs and LDT1s, and LDT2s to the extent required by subdivision C.2.2(c), produced by the manufacturer and delivered for sale in California that must be ZEVs, subject to the conditions in subdivision C.2.2. The ZEV requirement will be based on the annual NMOG production report for the appropriate model year.~~

~~Model Year~~	~~Credit Percentage Requirement~~
~~2018~~	~~4.5%~~
~~2019~~	~~7.0%~~
~~2020~~	~~9.5%~~
~~2021~~	~~12.0%~~
~~2022~~	~~14.5%~~
~~2023~~	~~17.0%~~
~~2024~~	~~19.5%~~
~~2025 and subsequent~~	~~22.0%~~

~~(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 at least 30 percent from the previous year due to circumstances that were unforeseeable and beyond their control.~~

~~(c) — [Reserved]~~

~~(d) — *Exclusion of ZEVs in Determining a Manufacturer's Sales Volume.* In calculating a manufacturer's applicable sales, using either method described in subdivision C.2.1(b), a manufacturer shall exclude the number of NEVs produced and delivered for sale in California by the manufacturer itself, or by a subsidiary in which the manufacturer has more than 33.4 percent ownership interest.~~

~~2.2 — Requirements for Large Volume Manufacturers.~~

~~(a) — [Reserved]~~

~~(b) — [Reserved]~~

~~(c) — [Reserved]~~

~~(d) — [Reserved]~~

~~(e) — *Requirements for Large Volume Manufacturers in 2018 and through 2025 Model Years.* LVMs must produce credits from ZEVs equal to minimum ZEV floor percentage requirement, as enumerated below. Manufacturers may fulfill the remaining ZEV requirement with credits from TZEVs, as enumerated below.~~

~~<i>Model Years</i>~~	~~<i>Total ZEV- Percent Requirement</i>~~	~~<i>Minimum ZEV floor</i>~~	~~<i>TZEVs</i>~~
~~2018~~	~~4.5%~~	~~2.0%~~	~~2.5%~~
~~2019~~	~~7.0%~~	~~4.0%~~	~~3.0%~~
~~2020~~	~~9.5%~~	~~6.0%~~	~~3.5%~~
~~2021~~	~~12.0%~~	~~8.0%~~	~~4.0%~~
~~2022~~	~~14.5%~~	~~10.0%~~	~~4.5%~~
~~2023~~	~~17.0%~~	~~12.0%~~	~~5.0%~~

2024	19.5%	14.0%	5.5%
2025	22.0%	16.0%	6.0%

~~(f) — Requirements for Large Volume Manufacturers in Model Year 2026 and Subsequent.~~ In 2026 and subsequent model years, a manufacturer must meet a total ZEV credit percentage of 22%. The maximum portion of a manufacturer's credit percentage requirement that may be satisfied by TZEV credits is limited to 6% of the manufacturer's applicable California PC and LDT production volume. ZEV credits must satisfy the remainder of the manufacturer's requirement.

~~2.3 — Requirements for Intermediate Volume Manufacturers.~~ For 2018 and subsequent model years, an intermediate volume manufacturer may meet all of its ZEV credit percentage requirement, under subdivision C.2, with credits from TZEV.

~~2.4 — Requirements for Small Volume Manufacturers and Independent Low Volume Manufacturers.~~ A small volume manufacturer is not required to meet the ZEV credit percentage requirements. However, a small volume manufacturer may earn, bank, market, and trade credits for the ZEVs and TZEVs it produces and delivers for sale in California.

~~2.5 — [Reserved]~~

~~2.6 — [Reserved]~~

~~2.7 — Changes in Small Volume, Independent Low Volume, and Intermediate Volume Manufacturer Status in 2018 and subsequent model years.~~

~~(a) Increases in California Production Volume.~~ For 2018 and subsequent 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 (i.e., total production volume exceeds 13,500 vehicles in a three-year period), for three consecutive averages, the manufacturer shall no longer be treated as a small volume manufacturer, and must comply with the ZEV requirements for intermediate volume manufacturers beginning with the next model year after the last model year of the third consecutive average. For example, if (a small volume) Manufacturer A exceeds 4,500 PCs, LDTs, and MDVs for their 2018 — 2020, 2019 — 2021, and 2020 — 2022 model year averages, Manufacturer A would be subject to intermediate volume requirements starting in 2023 model year.

If an intermediate volume manufacturer's average California production volume exceeds 20,000 units of new PCs, LDTs, and MDVs in five consecutive model years based on the average number of vehicles produced and delivered for sale in the five associated sets of three model year averages that begin no sooner than the 2018 model year associated with the 2015 through 2017 three-year average (i.e., total production volume

~~exceeds 60,000 vehicles in each of five consecutive three-year periods), the manufacturer shall no longer be treated as an intermediate volume manufacturer and shall comply with the ZEV requirements for large volume manufacturers beginning with the next model year after the model year corresponding to the fifth consecutive three-year average. For example, if (an intermediate volume) Manufacturer B exceeds 20,000 PCs, LDTs, and MDVs for its 2016–2018, 2017–2019, 2018–2020, 2019–2021, and 2020–2022 averages, as evidenced by its 2019 through 2023 model year reports, Manufacturer B would be subject to large volume manufacturer requirements starting in the 2024 model year.~~

~~If an intermediate volume manufacturer's average annual automotive-related global revenues for the 2018, 2019, or 2020 fiscal year, based upon the immediately prior and consecutive three fiscal years, is no greater than 40 billion dollars, then the three-model-year production volume average corresponding to that fiscal year will not apply to the five consecutive three-model-year production volume averages necessary for transition to large volume manufacturer requirements conditional upon the manufacturer submitting to the Executive Officer, in writing, a report that demonstrates the types and numbers of ZEVs and TZEVs the manufacturer will deliver to California subsequent to the 2020 fiscal year to meet the requirements specified in subdivision C 2.1(a). For example, assuming the production volumes described for Manufacturer B at the end of the preceding paragraph, and assuming Manufacturer B had automotive-related global revenue of 39 billion dollars in fiscal year 2019 and 41 billion dollars in fiscal year 2020, the 2016–2018 production volume average associated with fiscal year 2019 would not apply, but the 2017–2019 production volume average associated with fiscal year 2020 would apply. Thus, Manufacturer B would be subject to large volume manufacturer requirements starting in the 2025 model year.~~

~~Any new requirement described in this subdivision will begin with the next model year after the last model year of the third or fifth consecutive three-year average when a manufacturer ceases to be a small or intermediate volume manufacturer respectively in 2018 or subsequent years due to the aggregation requirements in majority ownership situations. The first of the consecutive three-year averages shall not precede the 2015–through 2017 three-year average.~~

~~(b) *Decreases in California Production Volume.* If a manufacturer's average California production volume falls below 4,500 or 20,000 units of new PCs, LDT1 and 2s, and MDVs, based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, for three consecutive averages, the manufacturer shall be treated as a small volume or intermediate volume manufacturer, as applicable, and shall be subject to the requirements for a small volume or intermediate volume manufacturer beginning with the next model year. For example, if Manufacturer C falls below 20,000 PCs, LDTs, and MDVs for its 2019–2021, 2020–2022, and 2021–2023 averages, Manufacturer C would be subject to IVM requirements starting in 2024 model year.~~

~~(c) *Calculating California Production Volume in Change of Ownership*~~

~~*Situations.* Where a manufacturer experiences a change in ownership in a particular model year, the change will affect application of the aggregation requirements on the manufacturer starting with the next model year. When a manufacturer is simultaneously producing two model years of vehicles at the time of a change of ownership, the basis of determining next model year must be the earlier model year. The manufacturer's small or intermediate volume manufacturer status for the next model year shall be based on the average California production volume in the three previous consecutive model years of those manufacturers whose production volumes must be aggregated for that next model year. For example, where a change of ownership during the 2019 calendar year occurs and the manufacturer is producing both 2019 and 2020 model year vehicles resulting in a requirement that the production volume of Manufacturer A be aggregated with the production volume of Manufacturer B, Manufacturer A's status for the 2020 model year will be based on the production volumes of Manufacturers A and B in the 2017–2019 model years. Where the production volume of Manufacturer A must be aggregated with the production volumes of Manufacturers B and C for the 2019 model year, and during that model year a change in ownership eliminates the requirement that Manufacturer B's production volume be aggregated with Manufacturer A's, Manufacturer A's status for the 2020 model year will be based on the production volumes of Manufacturers A and C in the 2017–2019 model years. In either case, the lead time provisions in subdivisions 1962.2(b)(7)(A) and (B) will apply.~~

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) or 1976(b)(1)(E);

(c) *OBD.* Certify that the vehicle will meet the applicable on-board diagnostic requirements in sections 1968.1 or 1968.2, as applicable, for 150,000 miles; and

(d) *Extended Warranty.* Extend the performance and defects warranty period set forth in subdivisions 2037(b)(2) and 2038(b)(2) to 15 years or 150,000 miles, whichever occurs first, except that the time period is to be 10 years for a zero emission

energy storage device used for traction power (such as a battery, ultracapacitor, or other electric storage device).

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 equivalent all electric range (EAER) capability will generate allowance according to the following equation:

<i>UDDS Test Cycle Range (AER)</i>	<i>Allowance</i>
<10 all electric miles	0.00
≥10 miles range	$\text{TZEV Credit} = [(0.01) * \text{EAER} + 0.30]$
>80 miles (credit cap)	1.10

(1) Allowance for US06 Capability. TZEVs with US06 all electric range capability (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 G.7.3 of these test procedures.

(B) *[Reserved]*

(C) *[Reserved]*

(D) *[Reserved]*

(e) *Credit Hydrogen Internal Combustion Engine Vehicles.* A hydrogen internal combustion engine vehicle that meets the requirements of subdivision C.3.2 and has a total range of at least 250 UDDS miles will earn an allowance of 0.75, which may be in addition to allowances earned in subdivision C.3.3(a), and subject to an overall credit cap of 1.25

4. ~~[Reserved]~~ Qualification for Credits From ZEVs.

4.1 *[Reserved]*

4.2 *[Reserved]*

4.3 *[Reserved]*

4.4 *[Reserved]*

4.5 ~~[Reserved] 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:~~

$$\text{ZEV Credit} = (0.01) * (\text{UDDS range}) + 0.50$$

~~(1) — A ZEV with less than 50 miles UDDS range will receive zero credits.~~

~~(2) — Credits earned under this provision C.4.5(a) are be capped at 4 credits per ZEV.~~

~~(b) — [Reserved]~~

~~(c) — [Reserved]~~

~~(d) — [Reserved]~~

~~(e)~~

~~(1) — Counting Specified ZEVs Placed in a Section 177 State and in California. Large volume manufacturers and intermediate volume manufacturers with credits earned from hydrogen 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).~~

~~(2) Optional Section 177 State Compliance Path.~~

~~(A) Additional ZEV Requirements for Intermediate Volume Manufacturers. Intermediate volume manufacturers that elect the optional Section 177 state compliance path must generate additional 2012 and subsequent model year ZEV credits, including no more than 50% Type 1.5x and Type IIx vehicle credits and excluding all TZEV, NEV, Type 0 ZEV credits, and transportation system credits, in each Section 177 state to fulfill the following percentage requirements of their sales volume determined under subdivision~~

~~C.2.1(b):~~

~~Intermediate Volume Manufacturers~~

~~Model Year~~	~~Additional Section 177 State ZEV Requirements~~
~~Two model years prior to compliance with LVM requirements~~	~~0.75%~~
~~One model year prior to compliance with LVM requirements~~	~~1.50%~~

~~Subdivision C.4.5(e)(1) shall not apply to any ZEV credits used to meet an intermediate volume manufacturer's additional ZEV requirements for the appropriate model years as described in the table above under this subdivision C.4.5(e)(2)(A).~~

~~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, 2016.~~

~~(B) ZEV and TZEZ Percentages for Intermediate Volume Manufacturers. Intermediate volume manufacturers that have fully complied with the optional Section 177 state compliance path requirements in subdivision 1962.1(d)(5)(E)3 or intend to comply or have fully complied with requirements in subdivision C.4.5(e)(2)(A) are allowed to meet their total ZEV percentage requirements specified in subdivision C.2 in each section 177 state by utilizing subdivisions C.4.5(e)(2)(B)i. and ii., below.~~

~~**i. Trading and Transferring ZEV and TZEZ Credits within West Region Pool and East Region Pool.** Intermediate volume manufacturers may trade or transfer 2012 and subsequent model year ZEV and TZEZ credits within the West Region pool to meet the 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 2020 model year shortfall of 100 credits in State X, the manufacturer may transfer 100 (2018 through 2020 model year) ZEV credits from State Y, within the West Region pool. Intermediate volume manufacturers may trade or transfer 2012 and subsequent model year ZEV and TZEZ credits within the East Region pool to meet the requirements in subdivision C.2, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2020 model year shortfall of 100 credits in State W, the manufacturer may transfer 100 (2018 through 2020 model year) ZEV credits from State Z, within the East Region pool.~~

~~**ii. Trading and Transferring ZEV and TZEZ Credits between the West Region Pool and East Region Pool.** Intermediate volume manufacturers may trade or transfer 2012 and subsequent model year ZEV and TZEZ credits to meet the requirements in subdivision C.2. 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 2020 model year shortfall of 100 credits in the~~

~~West Region Pool, the manufacturer may transfer 130 (2018 through 2020-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.~~

~~(C) *Reduced ZEV and TZEZ Percentages for Large Volume Manufacturers.* Large 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 TZEZ percentages reduced from the minimum ZEV floor percentages and TZEZ 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):~~

ZEVs

<i>Model Year</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>
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%

TZEZs

<i>Model Year</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>
Existing TZEZ 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 TZEZ Percentage	2.25%	3.00%	3.50%	4.00%

Total Percent Requirement

<i>Model Year</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>
New Total Section 177 State Optional Requirements ⁴	3.50%	6.00%	8.75%	12.00%

~~i. *Trading and Transferring ZEV and TZEZ 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 2012 and subsequent model year ZEV and TZEZ credits within the West Region pool to meet the requirements in subdivision C.4.5(e)(2)(C) 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 (2012 through 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 2012 and subsequent model year ZEV and TZEV credits within the East Region pool to meet the requirements in subdivision C.4.5(e)(2)(C), 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 (2012 through 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 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 2012 and subsequent model year ZEV and TZEV credits to meet the requirements in subdivision C.4.5(e)(2)(C) 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 (2012 through 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.~~

~~(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 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 demonstrates the manufacturer has met the requirements of subdivisions C.4.5(e)(2)(B) and (C) 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, credit earned, and Section 177 state where delivery for sale of TZEVs and ZEV occurred and to meet manufacturer's requirements under subdivision C.4.5(e)(2)(A), (B), and (C).~~

~~(E) *Right to Request Vehicle Identification Numbers.* Upon request by the Executive officer, or a Section 177 state, each manufacturer that elects the~~

~~optional Section 177 state compliance path under subdivision 1962.1(d)(5)(E)3. or subdivision C.4.5(e)(2) shall provide the vehicle identifications numbers in the report required by subdivision C.4.5(e)(3)(D).~~

~~(F) *Failure to Meet Optional Section 177 State Compliance Path Requirements.* A large volume manufacturer that elects the optional Section 177 state compliance path subdivision under 1962.1(d)(5)(E)3. and does not meet the modified percentages in subdivision C.4.5(e)(2)(C) 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 total ZEV percentage requirements in section C.2 for all future model years in each Section 177 state, and the pooling provisions in subdivision C.4.5(e)(2)(C) shall not apply. Any future transfers of ZEV or TZEV credits between Section 177 states will be prohibited.~~

~~An intermediate volume manufacturer that elects the optional Section 177 state compliance path under subdivision 1962.1(d)(5)(E)3. or subdivision C.4.5(e)(2) but delivers fewer ZEVs than required under subdivision C.4.5(e)(2)(A) shall make up the deficit by the end of the second model year in which the manufacturer is complying as an large volume manufacturer. For example, an intermediate volume manufacturer that becomes subject to large volume manufacturer requirements in 2019 model year must deliver the number of ZEVs required by subdivision C.4.5(e)(2)(A) by June 30, 2021. The pooling provisions in subdivision C.4.5(e)(2)(B)i. and ii. shall not apply to an intermediate volume manufacturer that fails to provide the required amount of ZEVs under subdivision C.4.5(e)(2)(A). In that case, any future transfers of ZEV or TZEV credits within or between Section 177 states will be prohibited.~~

~~Penalties shall be calculated separately by each Section 177 state where a manufacturer fails to make up the ZEV deficits within the specified time and with the credits allowed by subdivision C.7.7(a).~~

~~(G) 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).~~

~~(f) *NEVs.* NEVs must meet the following to be eligible for 0.15 credits:~~

~~(1) *Specifications.* A NEV earns credit when it meets all the following specifications:~~

~~(A) *Acceleration.* The vehicle has a 0-20 mph acceleration of 6.0 seconds or less when operating with a payload of 332 pounds and starting with the battery at a 50% state of charge.~~

~~(B) *Top Speed.* The vehicle has a minimum top speed of 20 mph~~

~~when operating with a payload of 332 pounds and starting with the battery at a 50% state of charge. The vehicle's top speed shall not exceed 25 mph when tested in accordance with 49 CFR 571.500 (68 FR 43972, July 25, 2003).~~

~~(C) — Constant Speed Range. The vehicle has a minimum 25-mile range when operating at constant top speed with a payload of 332 pounds and starting with the battery at 100% state of charge.~~

~~(2) Battery Requirement. A qualifying NEV must be equipped with sealed, maintenance-free batteries.~~

~~(3) Warranty Requirement. A NEV drive train, including battery packs, must be covered for a period of at least 24 months. The first 6 months of the NEV warranty period must be covered by a full warranty; the remaining warranty period may be optional extended warranties (available for purchase) and may be prorated. If the extended warranty is prorated, the percentage of the battery pack's original value to be covered or refunded must be at least as high as the percentage of the prorated coverage period still remaining. For the purpose of this computation, the age of the battery pack must be expressed in intervals no larger than three months. Alternatively, a manufacturer may cover 50 percent of the original value of the battery pack for the full period of the extended warranty.~~

~~Prior to allowance approval, the Executive Officer may request that the manufacturer provide copies of representative vehicle and battery warranties.~~

~~(5) NEV Charging Requirements. A NEV must meet charging connection standard portion of the requirements specified in subdivision 1962.3(c).~~

~~(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):~~

~~(1) — Emissions Requirements. BEVxs must meet all TZEV requirements, specified in subdivision C.3.2 (a) through (d).~~

~~(2) — APU Operation. The vehicle's UDDS range after the APU first starts and enters "charge sustaining hybrid operation" must be less than or equal to the vehicle's UDDS all-electric test range prior to APU start. The vehicle's APU cannot start under any user-selectable driving mode unless the energy storage system used for traction power is fully depleted.~~

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

5. [Reserved]

6. [Reserved]

7. ~~[Reserved] Generation and Use of ZEV Credits; Calculation of Penalties.~~

~~7.1 Introduction. A manufacturer that produces and delivers for sale in California ZEVs or TZEVs in a given model year exceeding the manufacturer's ZEV requirement set forth in subdivision C.2 shall earn ZEV credits in accordance with this subdivision C.2.~~

~~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)(1)(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)(1)(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.~~

~~(c) Separate Credit Accounts. Credits from a manufacturer's ZEVs, BEVxs, TZEVs, and NEVs shall each be maintained in separate accounts.~~

~~(d) Rounding Credits. ZEV credits and debits shall be rounded to the nearest 1/100th only on the final credit and debit totals using the conventional rounding method.~~

~~7.3 ZEV Credits for MDVs and LDTs Other Than LDT1s. Credits from ZEVs and TZEVs classified as MDVs, may be counted toward the ZEV requirement for PCs and LDTs, and included in the calculation of ZEV credits as specified in this subdivision C.7 if the manufacturer so specifies.~~

~~7.4 ZEV Credits for Advanced Technology Demonstration Programs.~~

~~(a) [Reserved]~~

~~(b) ZEVs. ZEVs, including BEVxs, excluding NEVs, placed in a small or intermediate volume manufacturer's California advanced technology demonstration program for a period of two or more years, may earn ZEV credits even if the vehicle is not "delivered for sale" or registered with the~~

| ~~California DMV. To earn such credits, the~~

~~manufacturer must demonstrate to the reasonable satisfaction of the Executive Officer that the vehicles will be regularly used in applications appropriate to evaluate issues related to safety, infrastructure, fuel specifications or public education, and that for 50 percent or more of the first two years of placement the vehicle will be operated in California. Such a vehicle is eligible to receive the same credit that it would have earned if delivered for sale, and for fuel cell vehicles, placed in service. To determine vehicle credit, the model year designation for a demonstration vehicle shall be consistent with the model year designation for conventional vehicles placed in the same timeframe. Manufacturers may earn credit for up to 25 vehicles per model, per Section 177 state, per year under this subdivision C.7.4. A manufacturer's vehicles in excess of the 25-vehicle cap will not be eligible for advanced technology demonstration program credits.~~

~~7.5 ZEV Credits for Transportation Systems.~~

~~(a) [Reserved]~~

~~(b) [Reserved]~~

~~(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).~~

~~(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.~~

~~**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 December 31, 2016, to be eligible for this subdivision C.7.6(c), based on the following qualifications:~~

~~(A) A manufacturer must have no model year 2017 compliance debits and no outstanding debits from all previous model year compliance with sections 1961.1 and 1961.3, or compliance with the National greenhouse gas program as allowed by subdivisions 1961.1(a)(1)(A)(ii) and 1961.3(c), and~~

~~(B) A manufacturer must have no model year 2017 compliance debits and no outstanding debits from all previous model year compliance with section 1962.1, and~~

~~(C) A manufacturer must submit documentation of its projected product plans to show over compliance with the manufacturer's section 1961.3 requirements, or over compliance with the National greenhouse gas program requirements as allowed by subdivision 1961.3(c), by at least 2.0 gCO₂/mile in each model year through the entire 2018 through 2021 model year period.~~

~~(2) *Credit Generation and Calculation.* Manufacturers must calculate their over compliance with section 1961.3 requirements, or over compliance with the National greenhouse gas program requirements as allowed by subdivision 1961.3(c) 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, or compliance with the National greenhouse gas program requirements as allowed by subdivision 1961.3(c).~~

~~(A) At least 2.0 gCO₂/mile over compliance with section 1961.3, or over compliance with the National greenhouse gas program as allowed by subdivision 1961.3(c) is required in each year and the following equation must be used to calculate the amount of ZEV credits earned for purposes of this subdivision C.7.6(c):~~

$$\frac{[(\text{Manufacturer US PC and LDT Sales}) \times (\text{gCO}_2/\text{mile below manufacturer GHG standard for a given model year})]}{(\text{Manufacturer GHG standard for a given model year})}$$

~~(B) Credits earned under subdivision 1961.3(a)(9), or credits earned under 40 CFR, part 86, Subpart S, 86.1866-12(a), 86.1866-12(b), or 86.1870-12 may not be included in the calculation of gCO₂/mile credits for use in the above equation in subdivision (A). All ZEVs included in the calculation above must include associated upstream emission values found in section 1961.3.~~

~~(C) Banked gCO₂/mile credits earned under 1961.1 and 1961.3, or under the National greenhouse gas program requirements as allowed by subdivision 1961.3(c) from previous model years or from other manufacturers may not be included in the calculation of gCO₂/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).~~

~~20~~	~~20~~	~~20~~	~~20~~
~~18~~	~~19~~	~~20~~	~~21~~
~~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, or towards compliance with the National greenhouse gas program requirements as allowed by subdivision 1961.3(c).~~

~~(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 section 1961.3, or under the National greenhouse gas program requirements as allowed by subdivision 1961.3(c), and projected credits/debits for future years through 2021 under section 1961.3, or under the National greenhouse gas program requirements as allowed by subdivision 1961.3(c), and this subdivision C.7.6(c).~~

~~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 gCO₂/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).~~

~~(d) *Cap on Use of Specified Credits.*~~

~~For 2018 and subsequent model year, manufacturers may only meet up to 50% of the portion of their requirement that must be met with credits from ZEVs from a combination of credits earned under subsections 1962.1(d)(5)(G), 1962.1(g)(5), or subdivisions C.4.5(g), C.7.6(c). Individual caps for credits earned under subsections 1962.1(d)(5)(G), 1962.1(g)(5), or subdivisions C.4.5(g), C.7.6(c) remain in effect in any given model year.~~

~~**7.7** Requirement to Make Up a ZEV Deficit.~~

~~(a) *General.* A manufacturer that produces and delivers for sale in California fewer ZEVs or TZEVs than required to meet its ZEV credit obligation in a given model year must make up the deficit by the next model year by submitting a commensurate amount of ZEV credits to the Executive Officer. An intermediate volume manufacturer may request, and the Executive Officer may grant, up to three consecutive model years to make up a credit deficit for a given model year provided that: (1) it has delivered for sale in California ZEVs or TZEVs within that model year, and (2) it submits a plan to the Executive Officer, as part of the request, demonstrating how it will make up the credit deficit within the requested time period. The amount of ZEV credits required to be submitted shall be calculated by [i] adding the number of credits from ZEVs produced and delivered for sale in California by the manufacturer for the model year to the number of credits from TZEVs produced and delivered for sale in California by the manufacturer for the model year (for a LVM, not to exceed that permitted under subdivision C.2.2), and [ii] subtracting that total from the number of credits required to be produced and delivered for sale in California by the manufacturer for the model year. BEVx, TZEV, NEV, or converted AT PZEV and PZEV credits are not allowed to be used to fulfill a manufacturer's ZEV deficit; only credits from ZEVs may be used to fulfill a large volume manufacturer's ZEV deficit. Intermediate volume manufacturers may only use ZEV and TZEV credits to fulfill a manufacturer's ZEV deficit.~~

~~**7.8** *Penalty for Failure to Meet ZEV Requirements.* Any manufacturer that fails to produce and deliver for sale in California the required number of ZEVs and submit an appropriate amount of credits and does not make up ZEV deficits within the specified time allowed by subdivision C.7.7(a) shall be subject to the Health and Safety Code section 43211 civil penalty applicable to a manufacturer that sells a new motor vehicle that does not meet the applicable emission standards adopted by the state board. The cause of action shall be deemed to accrue when the ZEV deficit is not balanced by the end of the specified time allowed by subdivision 1962.2(g)(7)(A). For the purposes of Health and Safety Code section 43211, the number of vehicles not meeting the state board's standards shall be equal to the manufacturer's credit deficit,~~

~~rounded to the nearest 1/100th, calculated according to the following equation, provided that the percentage of a manufacturer's ZEV requirement for a given model year that may be satisfied with TZEVs or credit from such vehicles may not exceed the percentages permitted under subdivision C.2.2::~~

~~(No. of ZEV credits required to be generated for the model year) — (Amount of credits submitted for compliance for the model year)~~

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

9. [Reserved] Public Disclosure. ~~Records in the Board's possession for the vehicles subject to the requirements of section C shall be subject to disclosure as public records as follows:~~

~~(a) — Each manufacturer's annual production data and the corresponding credits per vehicle earned for ZEVs (including ZEV type), TZEVs, AT PZEVs, and PZEVs for the 2018 and subsequent model years; and~~

~~(b) — Each manufacturer's annual credit balances for 2018 and subsequent years for:~~

~~(1) — Each type of vehicle: ZEVs (minus NEVs), BEVx, NEV, TZEV, and discounted AT PZEV and PZEV credits; and~~

~~(2) — Advanced technology demonstration programs; and~~

~~(3) — Transportation systems; and~~

~~(4) — Credits earned under section C.4.4(c), including credits acquired from, or transferred to another party, and the parties themselves.~~

D. Certification Requirements.

1. Durability and Emission Testing Requirements. All ZEVs, excluding Type I.5x and Type IIx vehicles, are exempt from all mileage and service accumulation, durability-data vehicle, and emission-data vehicle testing requirements.

2. Information Requirements: Application for Certification. Except as noted below, the Part I (40 CFR §86.1843-01(c)) certification application shall include the following:

2.1 Identification and description of the vehicle(s) covered by the application.

2.2 Identification of the vehicle weight category to which the vehicle is certifying: PC, LDT 0-3750 lbs. LVW, LDT 3751-5750 lbs. LVW, LDT 3751 lbs. LVW - 8500 lbs. GVW, or MDV (state test weight range), and the curb weight and gross vehicle weight rating of the vehicle.

2.3 Identification and description of the propulsion system for the vehicle.

2.4 Identification and description of the climate control system used on the vehicle.

2.5 Projected number of vehicles produced and delivered for sale in California, and projected California sales.

2.6 Identification of the energy usage in kilowatt-hours per mile from:

(a) the battery output (DC energy) (to be submitted with the Part II certification application (40 CFR §86.1843-01(d));

(b) the point when electricity is introduced from the electrical outlet (AC energy); and

(c) the operating range in miles of the vehicle when tested in accordance with the All-Electric Range Test set forth in section F, below. For off-vehicle charge capable hybrid electric vehicles certifying to section G, the manufacturer shall provide the energy usage in kilowatt hours per mile from the Urban Equivalent All-Electric Range and the Highway Equivalent All-Electric Range.

2.7 For those vehicles that use fuel-fired heaters, the manufacturer shall provide:

(a) a description of the control system logic of the fuel-fired heater, including an evaluation of the conditions under which the fuel-fired heater can be operated and an evaluation of the possible operational modes and conditions under which evaporative emissions can exist;

(b) the exhaust emissions value per mile produced by the auxiliary fuel-fired heater operated between 68°F and 86°F; and

(c) the test plan which describes the procedure used to determine the mass emissions of the fuel-fired heater.

2.8 All information necessary for proper and safe operation of the vehicle, including information on the safe handling of the battery system, emergency procedures to follow in the event of battery leakage or other malfunctions that may affect the safety of the vehicle operator or laboratory personnel.

2.9 Method for determining battery state-of-charge, battery charging capacity and recharging procedures, and any other relevant information as determined by the Executive Officer.

2.10 Battery specific energy data and calculations as specified in section F.4 of these procedures including the weight of the battery system and the three hour discharge rate (C/3) energy capacity.

2.11 Vehicle and battery break-in period, and the method used to determine them, as specified in sections F.2 and G.2 of these test procedures.

2.12 Labeling shall conform with the requirements specified in section 1965, title 13, CCR and the "California Environmental Performance Label Specifications for 2009 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles" (incorporated by reference therein).

2.13 For a ZEV, extended range HEV or PZEV that qualifies to receive one or more multipliers under sections C.3 - C.7, the manufacturer shall provide all information relevant to the vehicle's qualification for, and the estimated value of, the multiplier(s). The Executive Officer may request additional information needed to appropriately characterize the vehicle. Based on the submitted information and other relevant data, the Executive Officer shall assign to the vehicle the highest multiplier(s) for which the manufacturer has demonstrated the vehicle qualifies at that time.

2.14 When a manufacturer plans to require any scheduled maintenance for a PZEV before 150,000 miles, the manufacturer must submit information demonstrating the need for each scheduled maintenance item before 150,000 miles, including actual in-use data, engineering evaluation of the durability of the part, or other relevant information. The manufacturer may require such maintenance for a PZEV only upon the Executive Officer's determination, prior to certification, the manufacturer has demonstrated the need for the scheduled maintenance; this determination may not unreasonably be denied.

2.15 For off-vehicle charge capable hybrid electric vehicles certifying to section G, the manufacturer shall provide the Urban All-Electric Range (AER_u), Urban Charge-Depleting Cycle Range (R_{cdcu}), the Urban Charge-Depleting Actual Range (R_{cdau}), the Urban Charge-Depleting to Charge-Sustaining Range (R_{cdcsu}), the Highway All-Electric Range (AER_h), the Highway Charge-Depleting Cycle Range (R_{cdch}), the Highway

Charge-Depleting Actual Range (R_{cdah}), the Highway Charge-Depleting to Charge-Sustaining Range (R_{cdcs}), the Urban Equivalent All-Electric Range ($EAER_u$), the Highway Equivalent All-Electric Range ($EAER_h$), the Urban Electric Range Fraction (ERF_u), and the Highway Electric Range Fraction (ERF_h). In addition, the manufacturer shall provide the following:

- (a) all data recorded in accordance with section G.3.1;
- (b) worst case emissions from each test cycle used to determine compliance with all applicable emission standards (a manufacturer must clearly indicate where the reported emissions from each of these test cycles are used in the calculations in sections G.8, G.10, G.11, and G.12);
- (c) grams per mile emissions of NMOG, NO_x, CO, and CO₂ for each test cycle conducted in accordance with sections G.4 (if applicable), G.5, G.6, G.7, and G.8;
- (d) end-of-test option(s) selected for the Urban Charge-Sustaining Emission Test and Urban Charge-Depleting Emission Test as described in section(s) G.5.3 and G.5.4.2, respectively;
- (e) if the Alternative Urban Charge-Depleting Emission Test was used as described in section G.5.4.5 and if so, the AER/EAER ratio and the attestation that a minimum of four UDDS cycles were driven without any engine startups.
- (f) end-of-test option selected for Highway Emission Test as described in section G.6.1;
- (g) end-of-test option selected for US06 Test as described in section G.7.1;
- (h) end-of-test option selected for SC03 Test as described in section G.7.2.

~~**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.~~

E. [Reserved] ~~Determination of NEV Acceleration, Top Speed, and Constant Speed Range~~

~~The acceleration and constant speed range for a NEV shall be determined as specified in ETA-NTP002 Revision 3, "Implementation of SAE Standard J1666 May 93: Electric Vehicle Acceleration, Gradeability, and Deceleration Test Procedure," (December 1, 2004), and ETA-NTP004 Revision 3, "Electric Vehicle Constant Speed Range Tests," February 1, 2008.~~

F. Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles (including Fuel Cell Vehicles and Hybrid Fuel Cell Vehicles) and All 2018 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 and the 40 CFR Part 1066 regulations referenced by this document are the dates identified in the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” unless otherwise noted. 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.

Migration of the test procedures for measuring exhaust emissions from 40 CFR Part 86 to 40 CFR Part 1066 and from 40 CFR Part 600 to 40 CFR Part 1066 shall be done in accordance with Part II, Subpart A, section 100.1 and Part I, Subpart B, section 2, respectively, of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.”

A manufacturer of a hybrid vehicle equipped with an energy storage device that is not included in these procedures may request Executive Officer approval to employ an alternative to the SOC Criterion in section F.9. Executive Officer approval of an SOC Criterion alternative shall be conditioned upon the manufacturer providing supporting data and/or engineering evaluation demonstrating the equivalence of the proposed alternative procedure to the SOC Criterion.

1. Electric Dynamometer. ZEVs and HEVs must be tested using an electric dynamometer meeting the requirements of 40 CFR Part 1066 Subpart C.

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 for Zero-Emission Vehicles (including Fuel Cell Vehicles and Hybrid Fuel Cell Vehicles). All 2018 and subsequent model ZEVs shall be subject to the All-Electric Range Test specified below for the purpose of determining the energy efficiency and operating range of the ZEV.

3.1 Determination of Urban All-Electric Range for Zero-Emission Vehicles.

3.1.1 Urban All-Electric Range Test for Battery Electric Vehicles.

The urban all-electric range for a battery electric vehicle shall be determined in accordance with this section F.3.1.1. As an option, a manufacturer may elect to determine the urban all-electric range for a battery electric vehicle in accordance with SAE J1634.

(a) **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. Charge time shall not exceed soak time.

(b) At the end of the cold soak period, the vehicle shall be placed or pushed, onto a dynamometer and operated through successive Urban Dynamometer Driving Schedules (UDDS), 40 CFR, Part 86, Appendix I [February 19, 2015], which is incorporated herein by reference. A 10-minute soak shall follow each UDDS.

(c) 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 §86.115-78 (b)(1) and (2) or in 40 CFR §1066.425, as applicable, in accordance with 40 CFR §86.101, or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc.

(d) 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 §1066.425 in accordance with 40 CFR §86.101. 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.

3.1.2 Urban All-Electric Range Test for Fuel Cell Vehicles and Hybrid Fuel Cell Vehicles.

(a) The urban all-electric range for a fuel cell vehicle and a hybrid fuel cell vehicle shall be determined in accordance with SAE J2572. As an option, a manufacturer may elect to determine the urban all-electric range for a fuel cell vehicle or a hybrid fuel cell vehicle in accordance with section F.3.1.1 above.

3.2 Determination of Highway All-Electric Range for Zero-Emission Vehicles and Range for Fuel Cell Vehicles and Hybrid Fuel Cell Vehicles.

3.2.1 Highway All-Electric Range Test for Battery Electric Vehicles.

(a) **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. Charge time shall not exceed soak time.

(b) At the end of the cold soak period, the vehicle shall be either placed or pushed onto a dynamometer and operated through Continuous Highway Test Schedules of the Highway Fuel Economy Driving Schedule (HFEDS).

(c) 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 §1066.425 in accordance with 40 CFR §86.101, or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc.

(d) 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 §1066.425 in accordance with 40 CFR §86.101. 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 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.

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

3.2.2 Highway All-Electric Range Test for Fuel Cell Vehicles and Hybrid Fuel Cell Vehicles.

(a) The highway all-electric range for a fuel cell vehicle and a hybrid fuel cell vehicle shall be determined in accordance with SAE J2572. As an option, a manufacturer may elect to determine the highway all-electric range for a fuel cell vehicle or a hybrid fuel cell vehicle in accordance with section F.3.2.1 above.

3.3 Recording requirements.

For all battery electric vehicles and hybrid electric vehicles, except off-vehicle charge capable hybrid electric vehicles: Once the vehicle is no longer able to maintain the speed and time requirements specified in F.3.1 or F.3.2 above, the vehicle shall be brought to an immediate stop and the following data shall be 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;
- (d) DC energy required to fully charge the battery after the All-Electric Range Test from the point where electricity is introduced from the battery charger to the battery; and
- (e) Measured AC and DC watt hours and amp hours shall be reported to the nearest hundredths of a kilowatt hour and tenths of an amp hour.

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

3.4 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 for normal driving conditions prior to the commencement of the test. The driving schedule speed and time tolerances specified in F.3.1 or F.3.2 shall not be exceeded due to the operation of the regenerative braking system.

3.5 Measurement Accuracy. For battery electric vehicles, the overall error in voltage and current recording instruments shall be NIST traceable with an accuracy as specified in 40 CFR §1066.501 subparagraph (a)(iv) [February 19, 2015]. Instruments measuring voltage and current shall be as specified in 40 CFR §1066.501 subparagraph (a)(iv)(4) [February 19, 2015].

3.6 Watt Hour Calculation for Battery Electric Vehicles.

DC energy (watt-hours) shall be calculated as follows

$$\text{DC energy} = \int v(t) * i(t) dt$$

Where v = vehicle DC main battery pack voltage

i = vehicle DC main battery pack current

AC energy (in watt-hours) shall be calculated as follows

AC energy = $\int v(t) * i(t) dt$ in watt-hours
Where v = AC instantaneous voltage
 i = AC instantaneous current

3.7 Charger Requirements for Battery Electric Vehicles.

The standard charging apparatus (or equivalent) normally furnished with or specified for the vehicle shall be used for charging during vehicle testing.

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°F and 86°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 to obtain a grams per mile value.

6. Urban Emission Test Provisions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Off-Vehicle Charge Capable Hybrid Electric Vehicles.

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.

For vehicles with one or more driver-selectable modes (e.g., normal mode, economy mode, performance mode, or any other operating mode available to the driver), emission testing must be done in the one driver-selectable mode that represents the worst case urban NMOG + NO_x emissions over the Urban Emission Test set forth in this section F.6. For example, if a vehicle has two driver-selectable modes, the manufacturer shall determine worst case NMOG + NO_x emissions by comparing the emission results of the two driver-selectable modes. Compliance with applicable emission standards shall be based on worst case emission testing.

Confirmatory testing and/or in-use compliance testing may be performed in any driver-selectable mode to ensure compliance with emission standards.

6.1 Urban Test Applicability and General Provisions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Off-Vehicle Charge Capable Hybrid Electric Vehicles.

To be conducted pursuant to 40 CFR §1066.801 with the following revisions:

6.1.1 Subparagraphs (a) through (b). [No change.]

6.1.2 Amend subparagraph (c)(1): The Urban Emission Test, which includes the general driving cycle.

6.1.3 Amend subparagraph (c)(1)(i): The Urban Emission Test consists of an engine startup during the first UDDS cycle followed by a 10-minute key-off soak. The first engine startup (with all accessories turned off) that occurs during a UDDS cycle with vehicle shutdown at the end of the UDDS cycle makes a complete cold-start UDDS cycle. Following a 10-minute key-off soak, the subsequent UDDS cycle is a hot-start UDDS cycle. The UDDS cycle can be considered as a two phase cycle where the first 505 seconds of the UDDS cycle is the transient phase, and the remaining 867 seconds of the UDDS cycle is the stabilized phase.

6.1.4 Delete subparagraphs (c)(1)(ii) through (c)(5).

6.1.5 Subparagraph (d). [No change.]

6.1.6 Subparagraph (e). [No change except the hot soak test temperature in the three-day diurnal emission test sequence is 105°F.]

6.2 Urban Vehicle Preconditioning for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Off-Vehicle Charge Capable Hybrid Electric Vehicles.

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:

6.2.1 The vehicle shall be preconditioned in the driver-selectable mode to be tested.

6.2.2 The hybrid electric vehicle shall be pushed or towed to a work area for the initial fuel drain and fill according to section III.D.1. of the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.”

6.2.3 Following the initial fuel drain and fill, the vehicle shall complete an initial soak period of a minimum of 6 hours. After completing the initial soak period,

the vehicle shall be pushed or towed into position on a dynamometer and preconditioned by driving the UDDS cycle.

6.2.4 After completing the preconditioning drive, initial state-of-charge may be set by driving an additional distance on the chassis dynamometer such that the SOC Criterion is satisfied by applying the $\pm 1\%$ SOC Net Energy Change Tolerances in section F.9. However, if the alternative End-of-Test Criterion in section F.6.3.18 is used, then setting initial SOC shall not be permitted due to the larger $\pm 5\%$ SOC Net Energy Change Tolerance provided by the alternative End-of-Test Criterion in section F.6.3.18.

6.2.5 A fuel drain and fill shall be performed pursuant to the provisions of the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.”

6.2.6 The vehicle shall be soaked for 12-36 hours. During this soak period, canister preconditioning shall be performed pursuant to the provisions of the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.” Initial SOC may be set during the soak period by discharging or charging the battery such that the SOC Criterion is satisfied when applying the $\pm 1\%$ SOC Net Energy Change Tolerances in section F.9. However, if the alternative End-of-Test Criterion in section F.6.3.18 is used, then setting initial SOC shall not be permitted due to the larger $\pm 5\%$ SOC Net Energy Change Tolerance provided by the alternative End-of-Test criterion in section F.6.3.18.

6.3 Urban Dynamometer Test Run, Gaseous and Particulate Emissions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Off-Vehicle Charge Capable Hybrid Electric Vehicles.

To be conducted pursuant to 40 CFR §1066.815 with the following revisions:

6.3.1 Amend subparagraph (a): *General*. The Urban Emission Test consists of a cold-start UDDS cycle and a hot-start UDDS cycle as described in section F.6.1.3. If driver-selectable modes are available, activate the driver-selectable mode to be tested for the Urban Emission Test to determine worst case emissions as described in the introductory paragraphs of section F.6.

6.3.2 Amend subparagraph (b): *PM sampling options*. Collect PM using the procedures specified in subparagraphs (b)(1) or (b)(2) or (b)(5) of 40 CFR §1066.815 (subparagraphs (b)(3) and (b)(4) are not applicable) and use the corresponding equation in section F.6.5 to calculate composite PM emissions. Testing must meet the requirements related to filter face velocity as described in 40 CFR §1065.170(c)(1)(vi) [April 28, 2014], except as specified in paragraph (b)(5) of 40 CFR §1066.815. For procedures involving flow weighting, set the filter face velocity to a weighting target of 1.0 to meet the requirements of 40 CFR §1065.170(c)(1)(vi) [April 28, 2014]. Allow filter face velocity to decrease as a

percentage of the weighting factor if the weighting factor is less than 1.0. Use the appropriate equations in 40 CFR §1066.610 to show that you meet the dilution factor requirements of 40 CFR §1066.110(b)(2)(iii)(B).

6.3.3 Amend subparagraphs (b)(1): A separate PM sample for transient and stabilized phases of the cold-start UDDS cycle and the hot-start UDDS cycle may be collected. This may be done by sampling with four filters.

6.3.4 Subparagraph (b)(2). [No change.]

6.3.5 Delete subparagraphs (b)(3) and (b)(4).

6.3.6 Subparagraphs (b)(5) through (c)(2). [No change.]

6.3.7 Delete subparagraph (c)(3).

6.3.8 Amend subparagraph (d): *Test sequence*. Follow the exhaust emission measurement procedures specified in 40 CFR §1066.410 through §1066.425, subject to the following exceptions and additional provisions:

6.3.9 Subparagraph (d)(1). [No change.]

6.3.10 Amend subparagraph (d)(1)(i): Precondition the vehicle as described in section F.6.2. Initiate the cold-start UDDS cycle in the driver-selectable mode to be tested for the Urban Emission Test following the 12 to 36 hour soak period.

6.3.11 Subparagraphs (d)(1)(ii) and (d)(1)(iii). [No change.]

6.3.12 Amend subparagraph (d)(1)(iv): Five seconds after the vehicle is turned off, stop all stabilized interval sampling and recording, including background sampling. Stop any integrating devices for the stabilized interval and indicate the end of the stabilized interval in the recorded data. Note that the 5 second delay is intended to account for sampling system transport.

6.3.13 Subparagraph (2). [No change.]

6.3.14 Amend subparagraph (2)(i): Initiate the hot-start UDDS cycle in the same driver-selectable mode as in section F.6.3.10 above (9 to 11) minutes after the end of the sample period for the cold-start UDDS cycle.

6.3.15 Amend subparagraph (2)(ii): Repeat the steps in paragraph (d)(1)(ii) of this section.

6.3.16 Amend subparagraph (2)(iii): For bag 4 measurement or single bag per UDDS cycle measurement, operate the vehicle over the remainder of the UDDS

and conclude the testing as described in paragraphs (d)(1)(iii) and (iv) of this section.

6.3.17 Amend subparagraph (3): **End-of-Test Criteria.** A valid test shall satisfy the SOC Net Energy Change Tolerances in section F.9. For HEVs that use a battery as an energy storage device, (Amp-hr_{initial}) is the stored charge at the beginning of the cold-start UDDS cycle, and (Amp-hr_{final}) is the stored battery charge at the end of the subsequent hot-start UDDS cycle. The final stored battery charge, (Amp-hr_{final}), shall not exceed either (Amp-hr_{final})_{max} or (Amp-hr_{final})_{min} for a valid test. For HEVs that use a capacitor as an energy storage device, (V²_{initial}) is the square of the capacitor voltage stored at the beginning of the cold-start UDDS cycle, and (V_{final}) is the stored capacitor voltage at the end of the subsequent hot-start UDDS cycle. The final stored capacitor voltage, (V_{final}), shall not exceed either (V_{final})_{max} or (V_{final})_{min} for a valid test. For HEVs that use an electro-mechanical flywheel as an energy storage device, (rpm²_{initial}) is the squared flywheel rotational speed at the beginning of the cold-start UDDS cycle, and (rpm_{final}) is the flywheel rotational speed at the end of the subsequent hot-start UDDS cycle. The final flywheel rotational speed, (rpm_{final}), shall not exceed either (rpm_{final})_{max} or (rpm_{final})_{min} for a valid test

6.3.18 **Additional End-of-Test Criterion.** If the SOC Net Energy Change Tolerance is not satisfied after the hot-start UDDS cycle in section F.6.3.17, then the alternative End-of-Test criterion of ±5% SOC Net Energy Change Tolerance in Appendix C of SAE J1711 may be used to validate an Urban Emission Test with approval from the Executive Officer. Appendix C of SAE J1711 may not be used to correct measured values for any emissions.

6.4 Calculations – Urban Gaseous Emissions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Off-Vehicle Charge Capable Hybrid Electric Vehicles.

To be conducted pursuant to 40 CFR §1066.820 [April 28, 2014] with the following revisions:

6.4.1 Subparagraph (a). [No change.]

6.4.2 Amend subparagraph (b): Calculate the final composite gaseous test results as a mass-weighted value, $e_{[\text{emission}]\text{-FTPcomp}}$, in grams per mile using the following equation:

$$e_{[\text{emission}]\text{-FTPcomp}} = 0.43 \left(\frac{m_e}{D_e} \right) + 0.57 \left(\frac{m_h}{D_h} \right)$$

Where:

m_c = the mass emissions determined from the cold-start UDDS cycle, in grams. If the cold-start UDDS cycle consists of phase 1 cold transient

emissions and phase 2 cold stabilized emissions, then sum phase 1 and phase 2 emissions to determine m_c .

D_c = the measured driving distance from the cold-start UDDS cycle, in miles. If the cold-start UDDS cycle consists of phase 1 distance and phase 2 distance, then sum phase 1 and phase 2 distances to determine D_c .

m_h = the mass emissions determined from the hot-start UDDS cycle, in grams. If the hot-start UDDS cycle consists of phase 3 hot transient emissions and phase 4 hot stabilized emissions, then sum phase 3 and phase 4 emissions to determine m_h .

D_h = the driving distance from the hot-start UDDS cycle, in grams. If the hot-start UDDS cycle consists of phase 3 distance and phase 4 distance, then sum phase 3 and phase 4 distances to determine D_h .

6.4.3 Subparagraph (c). [Not applicable.]

6.5 Calculations – Urban Particulate Emissions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Off-Vehicle Charge Capable Hybrid Electric Vehicles.

To be conducted pursuant to 40 CFR §1066.820 [April 28, 2014] with the following revisions:

6.5.1 Subparagraphs (a) to (b). [Not applicable.]

6.5.2 Amend subparagraphs (c) through (c)(1): Calculate the final composite PM test results as a mass-weighted value, $e_{PM-FTPcomp}$, in grams per mile as follows:

(1) Use the following equation for PM measured as described in §1066.815(b)(1) or (2):

$$e_{PM-FTPcomp} = 0.43 \left(\frac{m_{PM-eUDDS}}{D_e} \right) + 0.57 \left(\frac{m_{PM-hUDDS}}{D_h} \right)$$

Where:

$m_{PM-cUDDS}$ = the combined PM mass emissions determined from the cold-start UDDS cycle (phase 1 and phase 2), in grams, as calculated using Eq. 1066.605-2.

D_c = the measured driving distance from the cold-start UDDS cycle, in miles. If the cold-start UDDS cycle consists of phase 1 distance and phase 2 distance, then sum phase 1 and phase 2 distances to determine D_c .

$m_{PM-hUDDS}$ = the combined PM mass emissions determined from the hot-start UDDS cycle (phase 3 and phase 4), in grams, as calculated using Eq. 1066.605-2.

D_h = the driving distance from the hot-start UDDS cycle, in grams. If the hot-start UDDS cycle consists of phase 3 distance and phase 4 distance, then sum phase 3 and phase 4 distances to determine D_h .

6.5.3 Subparagraph (c)(2). [Not applicable.]

6.5.4 Amend subparagraph (c)(3): Use the following equation for PM measured as described in §1066.815(b)(5):

$$e_{PM-FTP_{eomp}} = \frac{m_{PM}}{0.43(D_c) + 0.57(D_h)}$$

Where:

m_{PM} = the combined PM mass emissions determined from the cold-start UDDS cycle and the hot-start UDDS cycle (phase 1, phase 2, phase 3, and phase 4), in grams, as calculated using Eq. 1066.605-4.

D_c = the measured driving distance from the cold-start UDDS cycle, in miles. If the cold-start UDDS cycle consists of phase 1 distance and phase 2 distance, then sum phase 1 and phase 2 distances to determine D_c .

D_h = the driving distance from the hot-start UDDS cycle, in grams. If the hot-start UDDS cycle consists of phase 3 distance and phase 4 distance, then sum phase 3 and phase 4 distances to determine D_h .

7. Highway Emission Test Provisions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Off-Vehicle Charge Capable Hybrid Electric Vehicles.

To be conducted pursuant to 40 CFR §1066.801, except as noted.

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.

For vehicles with one or more driver-selectable modes (e.g., normal mode,

economy mode, performance mode, or any other operating mode available to the driver), emission testing must be done in the one driver-selectable mode that represents the worst case highway NMOG + NOx emissions over the Highway Emission Test set forth in this section F.7. For example, if a vehicle has two driver-selectable modes, the manufacturer shall determine worst case NMOG + NOx emissions by comparing the emission results of the two driver-selectable modes. Compliance with applicable emission standards shall be based on worst case emission testing.

7.1 Determination of Highway Emissions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Off-Vehicle Charge Capable Hybrid Electric Vehicles.

To be conducted pursuant to 40 CFR §1066.840 with the following revisions:

7.1.1 Amend subparagraph (a): Perform the Highway Emission Test immediately following the Urban Emission Test or a previous Highway Emission Test when this is practical. If the Highway Emission Test starts more than 3 hours after the Urban Emission Test (including evaporative emission measurements, if applicable) or a previous Highway Emission Test, operate the vehicle over one UDDS cycle to precondition the vehicle. If driver-selectable modes are available, activate the driver-selectable mode to be tested for the UDDS preconditioning drive. Additional preconditioning UDDS cycles may be approved in advance by the Executive Officer if the need for additional preconditioning is demonstrated by the manufacturer.

7.1.2 Amend subparagraph (b): Operate the vehicle over the HFEDS cycle for preconditioning. If driver-selectable modes are available, activate the driver-selectable mode to be tested for the preconditioning drive and for the following HFEDS cycle with emission sampling. Allow the vehicle to idle for 15 seconds (with the vehicle in gear), then start a repeat run of the HFEDS cycle and simultaneously start sampling and recording. **End-of-Test Criterion:** A valid test shall satisfy the SOC Net Energy Change Tolerances in section F.9 for the HFEDS cycle with emission sampling. For HEVs that use a battery as an energy storage device, $(\text{Amp-hr}_{\text{initial}})$ is the stored charge at the beginning of the HFEDS cycle with emission sampling, and $(\text{Amp-hr}_{\text{final}})$ is the stored battery charge at the end of the same HFEDS cycle with emission sampling. The final stored battery charge, $(\text{Amp-hr}_{\text{final}})$, shall not exceed either $(\text{Amp-hr}_{\text{final}})_{\text{max}}$ or $(\text{Amp-hr}_{\text{final}})_{\text{min}}$ for a valid test. For HEVs that use a capacitor as an energy storage device, (V^2_{initial}) is the square of the capacitor voltage stored at the beginning of the same HFEDS cycle with emission sampling, and (V_{final}) is the stored capacitor voltage at the end of the HFEDS cycle with emission sampling. The final stored capacitor voltage, (V_{final}) , shall not exceed either $(V_{\text{final}})_{\text{max}}$ or $(V_{\text{final}})_{\text{min}}$ for a valid test. For HEVs that use an electro-mechanical flywheel as an energy storage device, $(\text{rpm}^2_{\text{initial}})$ is the squared flywheel rotational speed at the beginning of the HFEDS cycle with emission sampling, and $(\text{rpm}_{\text{final}})$ is the flywheel rotational speed at the end of the same HFEDS cycle with emission

sampling. The final flywheel rotational speed, ($\text{rpm}_{\text{final}}$), shall not exceed either ($\text{rpm}_{\text{final}}\text{max}$) or ($\text{rpm}_{\text{final}}\text{min}$) for a valid test.

7.1.3 Amend subparagraph (c): Turn the vehicle off at the end of the HFEDS cycle and stop all sampling and recording, including background. Stop any integrating devices and indicate the end of the test cycle in the recorded data.

7.1.4 **Additional End-of-Test Criterion.** If the SOC Net Energy Change Tolerance is not satisfied for the HFEDS cycle with emission sampling in section F.7.1.2, then the alternative End-of-Test criterion of $\pm 5\%$ SOC Net Energy Change Tolerance in Appendix C of SAE J1711 may be used to validate a Highway Emission Test with approval from the Executive Officer. Appendix C of SAE J1711 may not be used to correct measured values for any emissions.

8. SFTP Emission Test Provisions for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Off-Vehicle Charge Capable Hybrid Electric Vehicles.

Alternative procedures may be used if approved in advance by the Executive Officer of the Air Resources Board.

For vehicles with one or more driver-selectable modes (e.g., normal mode, economy mode, performance mode, or any other operating mode available to the driver), emission testing must be done in the one driver-selectable mode that represents the worst case SFTP NMOG + NO_x emissions over the SFTP Emission Test set forth in this section F.8. For example, if a vehicle has two driver-selectable modes, the manufacturer shall determine worst case NMOG + NO_x emissions by comparing the emission results of the two driver-selectable modes. Compliance with applicable emission standards shall be based on worst case emission testing.

To be conducted pursuant to 40 CFR §1066.801, except as noted.

8.1 US06 Emission Test.

To be conducted pursuant to 40 CFR §1066.831 with the following revisions:

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

8.1.2 Amend subparagraph (b)(1)(i): For aggressive-driving tests that do not follow the Urban Emission Test or the Highway Emission Test.

8.1.3 Amend subparagraph (b)(1)(ii): For a test element that starts more than 72 hours after the most recent Urban Emission Test or Highway Emission Test (with or without evaporative emission measurements).

8.1.4 Amend subparagraph (b)(1)(iii): For testing in which the test vehicle has not remained in an area where ambient temperatures were within the range specified for testing since the previous Urban Emission Test or Highway Emission Test.

8.1.5 Subparagraphs (b)(2) through (b)(3)(i). [No change.]

8.1.6 Amend subparagraph(b)(3)(ii): Operate the vehicle one time over one of the driving schedules specified in this paragraph (b)(3)(ii). A particular preconditioning driving schedule that is related to fuel effects on adaptive memory systems may be requested. If driver-selectable modes are available, activate the driver-selectable mode to be tested for the preconditioning drive and for the following US06 cycle with emission sampling. Sampling equipment may be exercised, but emissions measured during preconditioning may not be used to determine compliance with applicable emission standards. Choose from the following driving schedules:

8.1.7 Subparagraphs (b)(3)(ii)(A) through (b)(3)(ii)(B). [No change.]

8.1.8 Amend subparagraph (b)(3)(ii)(C): The HFEDS cycle.

8.1.9 Subparagraphs (b)(3)(ii)(D) through (e)(2)(iii): [No change.]

8.1.10 Amend subparagraph (e)(3): Turn the vehicle off 2 seconds after the end of the last deceleration. Five seconds after the vehicle stops running, stop all sampling and recording, including background sampling. Stop any integrating devices and indicate the end of the test cycle in the recorded data. Note that the 5 second delay is intended to account for sampling system transport. **End-of-Test Criterion:** A valid test shall satisfy the SOC Net Energy Change Tolerances in section F.9 for the US06 cycle with emission sampling. For HEVs that use a battery as an energy storage device, $(\text{Amp-hr}_{\text{initial}})$ is the stored charge at the beginning of the US06 cycle with emission sampling, and $(\text{Amp-hr}_{\text{final}})$ is the stored battery charge at the end of the same US06 cycle with emission sampling. The final stored battery charge, $(\text{Amp-hr}_{\text{final}})$, shall not exceed either $(\text{Amp-hr}_{\text{final}})_{\text{max}}$ or $(\text{Amp-hr}_{\text{final}})_{\text{min}}$ for a valid test. For HEVs that use a capacitor as an energy storage device, (V^2_{initial}) is the square of the capacitor voltage stored at the beginning of the US06 cycle with emission sampling, and (V_{final}) is the stored capacitor voltage at the end of the US06 cycle with emission sampling. The final stored capacitor voltage, (V_{final}) , shall not exceed either $(V_{\text{final}})_{\text{max}}$ or $(V_{\text{final}})_{\text{min}}$ for a valid test. For HEVs that use an electro-mechanical flywheel as an energy storage device, $(\text{rpm}^2_{\text{initial}})$ is the squared flywheel rotational speed at the beginning of the US06 cycle with emission sampling, and $(\text{rpm}_{\text{final}})$ is the flywheel rotational speed at the end of the US06 cycle with emission sampling. The final flywheel rotational speed, $(\text{rpm}_{\text{final}})$, shall not exceed either $(\text{rpm}_{\text{final}})_{\text{max}}$ or $(\text{rpm}_{\text{final}})_{\text{min}}$ for a valid test.

8.1.11 Subparagraph (e)(4). [No change.]

8.1.12 Additional End-of-Test Criterion. If the SOC Net Energy Change Tolerance is not satisfied for the US06 cycle with emission sampling in section F.8.1.10, then the alternative End-of-Test criterion of $\pm 5\%$ SOC Net Energy Change Tolerance in Appendix C of SAE J1711 may be used to validate a US06 Emission Test with approval from the Executive Officer. Appendix C of SAE J1711 may not be used to correct measured values for any emissions.

8.2 SC03 Emission Test.

To be conducted pursuant to 40 CFR §1066.835 with the following revisions:

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

8.2.2 Amend subparagraph (c)(5): Perform a preconditioning drive by operating the test vehicle over the first 505 seconds of the UDDS cycle (phase 1), the last 867 seconds of the UDDS cycle (phase 2), or the SC03 driving schedule. If driver-selectable modes are available, activate the driver-selectable mode to be tested for the preconditioning drive and for the following SC03 cycle with emission sampling. If the air conditioning test sequence starts more than 2 hours after a different exhaust emission test, the vehicle may be driven over one full UDDS cycle for the preconditioning drive instead of over one of the cycles listed previously in this section (c)(5).

8.2.3 Subparagraphs (c)(6) through (d). [No change.]

8.2.4 Amend subparagraph (d)(1): Place the vehicle in gear 15 seconds after starting vehicle, which is 3 seconds before the first acceleration. If a driver-selectable mode is to be tested, start the vehicle, activate the driver-selectable mode, and place the vehicle in gear 15 seconds after starting vehicle. Follow the SC03 driving schedule.

8.2.5 Amend subparagraph (d)(2): Turn the vehicle off 2 seconds after the end of the last deceleration. Five seconds after the vehicle stops running, stop all sampling and recording, including background sampling. Stop any integrating devices and indicate the end of the test cycle in the recorded data. Note that the 5 second delay is intended to account for sampling system transport. End-of-Test Criterion: A valid test shall satisfy the SOC Net Energy Change Tolerances in section F.9 for the SC03 cycle with emission sampling. For HEVs that use a battery as an energy storage device, $(\text{Amp-hr}_{\text{initial}})$ is the stored charge at the beginning of the SC03 cycle with emission sampling, and $(\text{Amp-hr}_{\text{final}})$ is the stored battery charge at the end of the SC03 cycle with emission sampling. The final stored battery charge, $(\text{Amp-hr}_{\text{final}})$, shall not exceed either $(\text{Amp-hr}_{\text{final}})_{\text{max}}$ or $(\text{Amp-hr}_{\text{final}})_{\text{min}}$ for a valid test. For HEVs that use a capacitor as an energy storage device, (V^2_{initial}) is the square of the capacitor voltage stored at the beginning of the SC03 cycle with emission sampling, and (V_{final}) is the stored capacitor voltage at the end of the SC03

cycle with emission sampling. The final stored capacitor voltage, (V_{final}), shall not exceed either ($V_{\text{final}}\text{max}$) or ($V_{\text{final}}\text{min}$) for a valid test. For HEVs that use an electro-mechanical flywheel as an energy storage device, ($\text{rpm}^2_{\text{initial}}$) is the squared flywheel rotational speed at the beginning of the SC03 cycle with emission sampling, and ($\text{rpm}_{\text{final}}$) is the flywheel rotational speed at the end of the SC03 cycle with emission sampling. The final flywheel rotational speed, ($\text{rpm}_{\text{final}}$), shall not exceed either ($\text{rpm}_{\text{final}}\text{max}$) or ($\text{rpm}_{\text{final}}\text{min}$) for a valid test.

8.2.6 Subparagraphs (d)(3) through (f)(3)(iv). [No change.]

8.2.7 **Additional End-of-Test Criterion.** If the SOC Net Energy Change Tolerance is not satisfied for the SC03 cycle with emission sampling in section F.8.2.4, then the alternative End-of-Test criterion of $\pm 5\%$ SOC Net Energy Change Tolerance in Appendix C of SAE J1711 may be used to validate an SC03 Emission Test with approval from the Executive Officer. Appendix C of SAE J1711 may not be used to correct measured values for any emissions.

9. State-of-Charge Net Energy Change Tolerances for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Off-Vehicle Charge Capable Hybrid Electric Vehicles.

9.1 For hybrid electric vehicles that use a battery as an energy storage device, the following state-of-charge net energy change tolerance shall apply:

$$\left(\frac{NHV_{\text{fuel}} * m_{\text{fuel}}}{V_{\text{system}} * K_1} \right) (\text{Amp-hr}_{\text{final}}\text{max}) = (\text{Amp-hr}_{\text{initial}}) + 0.01 * \left(\frac{NHV_{\text{fuel}} * m_{\text{fuel}}}{V_{\text{system}} * K_1} \right)$$

$$(\text{Amp-hr}_{\text{final}})\text{min} = (\text{Amp-hr}_{\text{initial}}) - 0.01 * \left(\frac{NHV_{\text{fuel}} * m_{\text{fuel}}}{V_{\text{system}} * K_1} \right)$$

Where:

- ($\text{Amp-hr}_{\text{final}}\text{max}$) = Maximum allowed Amp-hr stored in battery at the end of the test
- ($\text{Amp-hr}_{\text{final}}\text{min}$) = Minimum allowed Amp-hr stored in battery at the end of the test
- ($\text{Amp-hr}_{\text{initial}}$) = Battery Amp-hr stored at the beginning of the test
- NHV_{fuel} = Net heating value of consumable fuel, in Joules/kg
- m_{fuel} = Total mass of fuel consumed during test, in kg
- K_1 = Conversion factor, 3600 seconds/hour
- V_{system} = Open circuit voltage (OCV) that corresponds to the SOC of the target SOC during charge sustaining operation. This value shall be submitted for testing purposes, and it shall be subject to confirmation by the Air Resources Board.

9.2 For hybrid electric vehicles that use a capacitor as an energy storage device, the following state-of-charge net energy change tolerance shall apply:

$$(V_{\text{final}})_{\text{max}} = \sqrt{V_{\text{initial}}^2 + 0.01 * \frac{(2 * NHV_{\text{fuel}} * m_{\text{fuel}})}{C}}$$

$$(V_{\text{final}})_{\text{min}} = \sqrt{V_{\text{initial}}^2 - 0.01 * \frac{(2 * NHV_{\text{fuel}} * m_{\text{fuel}})}{C}}$$

Where:

- $(V_{\text{final}})_{\text{max}}$ = The maximum stored capacitor voltage allowed at the end of the test
- $(V_{\text{final}})_{\text{min}}$ = The minimum stored capacitor voltage allowed at the end of the test
- V_{initial}^2 = The square of the capacitor voltage stored at the beginning of the test
- NHV_{fuel} = Net heating value of consumable fuel, in Joules/kg
- m_{fuel} = Total mass of fuel consumed during test, in kg
- C = Rated capacitance of the capacitor, in Farads

9.3 For hybrid electric vehicles that use an electro-mechanical flywheel as an energy storage device, the following state-of-charge net energy change tolerance shall apply:

$$(rpm_{\text{final}})_{\text{max}} = \sqrt{rpm_{\text{initial}}^2 + 0.01 * \frac{(2 * NHV_{\text{fuel}} * m_{\text{fuel}})}{I * K_3}}$$

$$(rpm_{\text{final}})_{\text{min}} = \sqrt{rpm_{\text{initial}}^2 - 0.01 * \frac{(2 * NHV_{\text{fuel}} * m_{\text{fuel}})}{I * K_3}}$$

Where:

- $(rpm_{\text{final}})_{\text{max}}$ = The maximum flywheel rotational speed allowed at the end of the test
- $(rpm_{\text{final}})_{\text{min}}$ = The minimum flywheel rotational speed allowed at the end of the test
- rpm_{initial}^2 = The squared flywheel rotational speed at the beginning of the test
- NHV_{fuel} = Net heating value of consumable fuel, in Joules/kg
- m_{fuel} = Total mass of fuel consumed during test, in kg
- K_3 = Conversion factor, $\frac{4\pi^2}{3600 \text{ sec}^2 - rpm^2}$

I = Rated moment of inertia of the flywheel, in kg-m²

10. 50°F and 20°F Test Provision for All Hybrid Electric Vehicles, Except Hybrid Fuel Cell Vehicles and Off-Vehicle Capable Hybrid Electric Vehicles.

50°F testing shall be conducted pursuant to section F.6 with the modifications in Part II, Section D of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles” and the additional following revisions.

20°F testing shall be conducted pursuant to section F.6 with the modifications in Part II Section B or Part II Section C, as applicable, of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles” and the additional following revisions.

10.1 To satisfy test requirements for the 50°F emission test, the vehicle shall be emission tested in driver-selectable mode (if available) that represents the worst case urban NMOG + NO_x emissions as determined in section F.6. To satisfy test requirements for the 20°F emission test, the vehicle shall be emission tested in the driver-selectable mode (if available) that represents the worst case CO emissions of the urban emission test following the procedure outlined in section F.6. For the 20°F and 50°F emission tests, the vehicle is not required to meet SOC net energy change tolerances.

10.2 One of the following two emission test options must be performed.

(i) A three phase test that includes phase one as the first 505 seconds of the cold-start UDDS cycle, phase two as the remaining 867 seconds of the cold-start UDDS cycle, a 10 minute key-off soak period, and phase three as the first 505 seconds of the hot-start UDDS cycle. Emission weighting is as follows:

$$Y_{wm} = 0.43 * \left(\frac{Y_1 + Y_2}{D_1 + D_2} \right) + 0.57 * \left(\frac{Y_2 + Y_3}{D_2 + D_3} \right)$$

Where:

Y_{wm} = Weighted mass emissions of each pollutant, i.e., THC, CO, THCE, NMOG, NMHCE, CH₄, NO_x, or CO₂, in grams per vehicle mile.

Y_1 = Mass emissions as calculated from phase one of the three phase test.

Y_2 = Mass emissions as calculated from phase two of the three phase

test.

Y_3 = Mass emissions as calculated from phase three of the three phase test.

D_1 = The measured driving distance from phase one of the three phase tests, in miles.

D_2 = The measured driving distance from phase two of the three phase tests, in miles.

D_3 = The measured driving distance from phase three of the three phase tests, in miles.

(ii) A two phase test that includes phase one as a UDDS cycle, a 10 minute key-off soak period, and phase two as a UDDS cycle. Emission weighting for the four phase test will follow the procedure outlined in section F.6.4.

G. Test Procedures for 2018 and Subsequent Model Off-Vehicle Charge Capable Hybrid Electric Vehicles.

The “as adopted or amended dates” of the 40 CFR Part 86 regulations and the 40 CFR Part 1066 regulations referenced by this document are the dates identified in the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” unless otherwise noted.

Migration of the test procedures for measuring exhaust emissions from 40 CFR Part 86 to 40 CFR Part 1066 shall be done in accordance with Part II, Subpart A, section 100.1 of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.”

1. Electric Dynamometer.

All off-vehicle charge capable HEVs must be tested using an electric dynamometer meeting the requirements of 40 CFR Part 1066 Subpart C.

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. General Testing Requirements.**3.1 Recording requirements.**

For off-vehicle charge capable hybrid electric vehicles: The following data shall be recorded for all tests and for each individual test cycle therein, except for the 20°F and 50°F tests, conducted in accordance with section G.8:

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

from the battery charger to the battery. As an alternative, DC energy required to fully charge the battery after a charge-depleting or charge-sustaining test from the point where electricity is introduced from the battery charger to the vehicle may be reported;

(e) Net DC amp-hrs from the battery that was expended during the test (may be reported as the total DC amp-hrs output and the total DC amp-hrs input); and

(f) Measured AC and DC watt hours and amp hours shall be reported to the nearest hundredths of a kilowatt hour and tenths of an amp hour.

3.2 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 for normal driving conditions prior to the commencement of the test. The driving schedule speed and time tolerances specified in 40 CFR §1066.425 shall not be exceeded due to the operation of the regenerative braking system.

3.3 Measurement Accuracy. The overall error in voltage and current recording instruments shall be NIST traceable with an accuracy as specified in 40 CFR §1066.501 subparagraph (a)(iv) [February 19, 2015]. Instruments measuring voltage and current shall be as specified in 40 CFR §1066.501 subparagraph (a)(iv)(4) [February 19, 2015].

3.4 Watt Hour Calculation.

DC energy (watt hours) shall be calculated as follows

$$\text{DC energy} = \int v(t) * i(t) dt$$

Wherev = vehicle DC main battery pack voltage

i = vehicle DC main battery pack current

AC energy (in watt-hours) shall be calculated as follows

$$\text{AC energy} = \int v(t) * i(t) dt \text{ in watt-hours}$$

Wherev = AC instantaneous voltage

i = AC instantaneous current

3.5 Charger Requirements

The standard charging apparatus (or equivalent) normally furnished with or specified for the vehicle shall be used for charging during vehicle testing.

4. Determination of the Emissions of the Fuel-fired Heater.

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°F and 86°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 to obtain a grams per mile value.

5. Urban Emission Test Provisions for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

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.

For the purpose of determining Urban All-Electric Range and Urban Equivalent All-Electric Range, the vehicle shall be range tested in default mode or in normal mode if the vehicle does not have a default mode.

For the purpose of demonstrating compliance with exhaust emission standards, a vehicle must be emission tested in the vehicle operation (i.e., either charge-depleting, charge-sustaining, or charge-increasing operation) that represents the worst case urban NMOG + NOx emissions.

Vehicles with one or more driver-selectable modes (e.g., normal mode, economy mode, performance mode, battery charging mode, or any other operating mode available to the driver) for a given charge-depleting, charge-sustaining, or charge-increasing operation must be emission tested in the one driver-selectable mode and vehicle operation (i.e., charge-depleting, charge-sustaining, charge-increasing) which represents the worst case urban NMOG + NOx emissions. For example, if a vehicle has two driver-selectable modes that can be tested in charge-depleting, charge-sustaining, and charge-increasing operations, the manufacturer shall determine worst case urban NMOG + NOx emissions by comparing the following (1) mode 1 charge-depleting emissions, (2) mode 2 charge-depleting emissions, (3) mode 1 charge-sustaining emissions, (4) mode 2 charge-sustaining emissions, (5) mode 1 charge-increasing emissions, and (6) mode 2 charge-increasing emissions based on the Urban Charge-Depleting Emission Test and Urban Charge-Sustaining Emission Test. The exception to this would be for vehicles qualifying for the Alternative Urban Charge-Depleting Emission Test where the one driver-selectable mode representing the worst case urban NMOG + NOx emissions would be tested only on the Alternative Urban Charge-Depleting Emission Test. In addition, some driver-selectable modes are incompatible with testing of certain vehicle operations. For example, a charge-increasing driver-selectable mode is not compatible with a charge-depleting test.

In lieu of demonstrating the worst case urban NMOG + NOx emissions by certification testing in every urban charge-depleting driver-selectable mode, every urban charge-sustaining driver-selectable mode, and every charge-increasing driver-selectable mode, a manufacturer may determine the worst case operating mode by using non-certification emission data and/or an engineering evaluation. The manufacturer must report the data and/or engineering evaluation used to determine the worst case operating mode. The manufacturer must demonstrate compliance with all applicable emission standards using test data for the worst case operating mode.

For vehicles that qualify for and are tested on the Alternative Urban Charge-Depleting Emission Test in section G.5.4.5, the urban worst case NMOG + NO_x emissions may be determined for the Alternative Urban Charge-Depleting Emission Test alone. Therefore, a vehicle qualifying for the Alternative Urban Charge-Depleting Emission Test would not be required to be emission tested in charge-depleting, charge-sustaining, charge-increasing operations. If driver-selectable modes are available, each driver-selectable mode must still be considered for worst case NMOG + NO_x emissions for the Alternative Urban Charge-Depleting Emission Test.

Confirmatory testing and/or in-use compliance testing may be performed in any driver-selectable mode in charge-depleting, charge-sustaining, or charge-increasing operation to ensure compliance with emission standards. For vehicles that qualify for and are certified on the Alternative Urban Charge-Depleting Emission Test, confirmatory testing and/or in-use compliance testing may be performed in any driver-selectable mode solely using the Alternative Urban Charge-Depleting Emission Test to ensure compliance with emission standards.

For the Urban Charge-Depleting Emission Test in section G.5.4.2, confirmatory and in-use compliance testing shall use two hot-start UDDS cycles to ensure that the vehicle has achieved full warm-up conditions in accordance with section G.5.4.2.1. If, based on the last cycle or series of cycles, the Additional End-of-Test criteria in section G.5.4.3.1 are not satisfied at the end of the second hot-start, then a third hot-start UDDS cycle shall be performed. If criteria are still not satisfied at the end of the third hot-start UDDS cycle, then additional hot-start UDDS cycles shall be performed until:

- (1) based on the last cycle or series of cycles, the Additional End-of-Test criteria in section G.5.4.3.1 are satisfied; or
- (2) the Additional End-of-Test criteria in section G.5.4.3.2 are satisfied.

For the Alternative Urban Charge-Depleting Emission Test, confirmatory and in-use compliance testing shall use one hot-start UDDS cycle as specified in section G.5.4.6.

5.1 Urban Test Applicability and General Provisions for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

To be conducted pursuant to 40 CFR §1066.801 with the following revisions:

5.1.1 Subparagraphs (a) through (b). [No change.]

5.1.2 Amend subparagraph (c)(1): The Urban Charge-Sustaining Emission Test and the Urban Charge-Depleting Emission Test.

5.1.3 Amend subparagraph (c)(1)(i): The Urban Charge-Sustaining Emission Test consists of an engine startup during the first UDDS cycle followed by a 10-minute key-off soak. The Urban Charge-Depleting Emission Test consists of a

series of charge-depleting UDDS cycles each followed by a 10-minute key-off soak until charge-sustaining operation is achieved. The Urban Charge-Depleting Emission Test begins with the vehicle at full state-of-charge with engine startup occurring during the driving of the series of charge-depleting UDDS cycles. The first engine startup (with all accessories turned off) that occurs during a UDDS cycle followed by a vehicle shutdown at the end of the UDDS cycle makes a complete cold-start UDDS cycle. After a 10-minute key-off soak, the subsequent UDDS cycle is a hot-start UDDS cycle. The UDDS cycle can be considered as a two phase cycle where the first 505 seconds of the UDDS cycle is the transient phase, and the remaining 867 seconds of the UDDS cycle is the stabilized phase. For the Urban Charge-Depleting Emission Test, additional hot-start UDDS cycles each followed by a 10-minute key-off soak may be needed to achieve charge-sustaining operation.

5.1.4 Subparagraphs (c)(1)(ii) through (c)(5). [Not applicable.]

5.1.5 Subparagraph (d). [No change.]

5.1.6 Subparagraph (e). [No change except the hot soak test temperature in the three-day diurnal emission test sequence is 105°F.]

5.2 Urban Vehicle Preconditioning for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

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:

5.2.1 The vehicle shall be preconditioned in charge-sustaining operation with the vehicle in default mode or in normal mode if the vehicle does not have default mode. If, however, the vehicle is to be tested in charge-increasing operation (this does not apply to a driver-selectable charge-increasing mode), then the initial SOC for the preconditioning drive shall be set at the lowest normal SOC level allowed by the vehicle when driving on the UDDS cycle.

5.2.2 The vehicle shall be pushed or towed to a work area for the initial fuel drain and fill according to section III.D.1.4 of the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.”

5.2.3 Following the initial fuel drain and fill, the vehicle shall complete an initial soak period of a minimum of 6 hours.

5.2.4 After completing the initial soak period, the vehicle shall be pushed or towed into position on a dynamometer and preconditioned.

5.2.5 For the Urban Charge-Depleting Emission Test and the Urban Charge-Sustaining Emission Test, the preconditioning cycle shall be the UDDS cycle and

performed at this time. For the Urban Charge-Sustaining Emission Test, except as noted in sections G.5.2.8.1, G.5.2.8.2, and G.5.2.8.3, the initial SOC may be set after the preconditioning cycle by driving an additional distance on the chassis dynamometer such that the SOC Criterion is satisfied when applying the $\pm 1\%$ SOC Net Energy Change Tolerances in section G.10.

5.2.6 A fuel drain and fill shall be performed pursuant to the provisions of the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.”

5.2.7 The vehicle shall be soaked for 12-36 hours. During this soak period, canister preconditioning shall be performed pursuant to the provisions of the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.”

5.2.8 For the Urban Charge-Depleting Emission Test, charge the vehicle to full state-of-charge as specified by the vehicle manufacturer. For the Urban Charge-Sustaining Emission Test, except as noted in sections G.5.2.8.1, G.5.2.8.2, and G.5.2.8.3, initial SOC may be set during the soak period by discharging or charging the vehicle such that the SOC Criterion is satisfied when applying the $\pm 1\%$ SOC Net Energy Change Tolerances in section G.10. For the Alternative Urban Charge-Depleting Emission Test, only the initial dynamometer run to determine urban all-electric range as described in G.5.4.5 (ii) would require the vehicle to be charged to full state-of-charge prior to testing. For any subsequent dynamometer run to determine urban emissions for the Alternative Urban Charge-Depleting Emission Test, the initial SOC would be set according to G.5.4.5 (iv). The vehicle must be turned off during charging and charge time shall not exceed soak time.

5.2.8.1 If the alternative End-of-Test Criterion in section G.5.3.18 is used, then initial SOC setting shall not be permitted after the preconditioning cycle nor during the soak period prior to the Urban Charge-Sustaining Emission Test.

5.2.8.2 If testing a vehicle in a charge-increasing driver-selectable mode, then initial SOC setting shall not be permitted after the preconditioning cycle nor during the soak period prior to the Urban Charge-Sustaining Emission Test.

5.2.8.3 If testing a vehicle in charge-increasing operation, then the initial SOC for the preconditioning drive shall be set at the lowest normal SOC level allowed by the vehicle when driving on the UDDS cycle.

5.3 Determination of Urban Charge-Sustaining Emissions – Dynamometer Test Run, Gaseous and Particulate Emissions for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

To be conducted pursuant to 40 CFR §1066.815 with the following revisions:

5.3.1 Amend subparagraph (a): *General*. The Urban Charge-Sustaining Emission Test consists of a cold-start UDDS cycle and a hot-start UDDS cycle as described in section G.5.1.3. If driver-selectable modes are available, activate the driver-selectable mode to be tested for the Urban Charge-Sustaining Emission Test to determine worst case emissions as described in the introductory paragraphs of section G.5. If a vehicle has a driver-selectable, charge-increasing mode, SOC shall be set in accordance with section G.5.4.5(iv) with the charge-increasing mode activated at the start of the cold-start UDDS cycle.

5.3.2 Amend subparagraph (b): *PM sampling options*. Collect PM using the procedures specified in subparagraphs (b)(1) or (b)(2) or (b)(5) of 40 CFR §1066.815 (subparagraphs (b)(3) and (b)(4) are not applicable) and use the corresponding equation in section G.5.6 to calculate composite PM emissions. Testing must meet the requirements related to filter face velocity as described in 40 CFR §1065.170(c)(1)(vi) [April 28, 2014], except as specified in paragraph (b)(5) of 40 CFR §1066.815 [February 19, 2015]. For procedures involving flow weighting, set the filter face velocity to a weighting target of 1.0 to meet the requirements of 40 CFR §1065.170(c)(1)(vi) [April 28, 2014]. Allow filter face velocity to decrease as a percentage of the weighting factor if the weighting factor is less than 1.0. Use the appropriate equations in 40 CFR §1066.610 to show that you meet the dilution factor requirements of 40 CFR §1066.110(b)(2)(iii)(B).

5.3.3 Amend subparagraphs (b)(1): A separate PM sample for transient and stabilized phases of the cold-start UDDS cycle and the hot-start UDDS cycle may be collected. This may be done by sampling with four filters.

5.3.4 Subparagraph (b)(2). [No change.]

5.3.5 Delete subparagraphs (b)(3) and (b)(4).

5.3.6 Subparagraphs (b)(5) through (c)(2). [No change.]

5.3.7 Delete subparagraph (c)(3).

5.3.8 Amend subparagraph (d): *Test sequence*. Follow the exhaust emission measurement procedures specified in 40 CFR §1066.410 through §1066.425, subject to the following exceptions and additional provisions:

5.3.9 Subparagraph (d)(1). [No change.]

5.3.10 Amend subparagraph (d)(1)(i): Precondition the vehicle as described in section G.5.2. Initiate the cold-start Urban Charge-Sustaining Emission Test in the driver-selectable mode to be tested following the 12 to 36 hour soak period.

5.3.11 Subparagraphs (d)(1)(ii) and (d)(1)(iii). [No change.]

5.3.12 Amend subparagraph (d)(1)(iv): Five seconds after the vehicle is turned off, stop all stabilized interval sampling and recording, including background sampling. Stop any integrating devices for the stabilized interval and indicate the end of the stabilized interval in the recorded data. Note that the 5 second delay is intended to account for sampling system transport.

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

5.3.14 Amend subparagraph (d)(2)(i): Initiate the hot-start UDDS cycle (9 to 11) minutes after the end of the sample period for the cold-start UDDS cycle.

5.3.15 Amend subparagraph (d)(2)(ii): Repeat the steps in paragraph (d)(1)(ii) of this section.

5.3.16 Amend subparagraph (d)(2)(iii): For bag 4 measurement or single bag per UDDS cycle measurement, operate the vehicle over the remainder of the UDDS and conclude the testing as described in paragraphs (d)(1)(iii) and (iv) of this section.

5.3.17 Amend subparagraph (3): **End-of-Test Criteria.** A valid test shall satisfy the SOC Net Energy Change Tolerances in section G.10. For PHEVs that use a battery as an energy storage device, $(\text{Amp-hr}_{\text{initial}})$ is the stored charge at the beginning of the cold-start UDDS cycle, and $(\text{Amp-hr}_{\text{final}})$ is the stored battery charge at the end of the subsequent hot-start UDDS cycle. The final stored battery charge, $(\text{Amp-hr}_{\text{final}})$, shall not exceed either $(\text{Amp-hr}_{\text{final}})_{\text{max}}$ or $(\text{Amp-hr}_{\text{final}})_{\text{min}}$ for a valid test. For PHEVs that use a capacitor as an energy storage device, (V^2_{initial}) is the square of the capacitor voltage stored at the beginning of the cold-start UDDS cycle, and (V_{final}) is the stored capacitor voltage at the end of the subsequent hot-start UDDS cycle. The final stored capacitor voltage, (V_{final}) , shall not exceed either $(V_{\text{final}})_{\text{max}}$ or $(V_{\text{final}})_{\text{min}}$ for a valid test. For PHEVs that use an electro-mechanical flywheel as an energy storage device, $(\text{rpm}^2_{\text{initial}})$ is the squared flywheel rotational speed at the beginning of the cold-start UDDS cycle, and $(\text{rpm}_{\text{final}})$ is the flywheel rotational speed at the end of the subsequent hot-start UDDS cycle. The final flywheel rotational speed, $(\text{rpm}_{\text{final}})$, shall not exceed either $(\text{rpm}_{\text{final}})_{\text{max}}$ or $(\text{rpm}_{\text{final}})_{\text{min}}$ for a valid test.

5.3.18 **Additional End-of-Test Criteria.** With approval from the Executive Officer, if the SOC Net Energy Change Tolerance is not satisfied after the hot-start UDDS cycle in section G.5.3.17, an Urban Charge-Sustaining Emission Test may be considered valid if:

5.3.18.1 The alternative End-of-Test criterion of $\pm 5\%$ SOC Net Energy Change Tolerance in Appendix C of SAE J1711 is satisfied (Note: Appendix C of SAE J1711 may not be used to correct measured values for any emissions.); or

5.3.18.2 The SOC at the end of the hot-start UDDS cycle is higher than the SOC at the beginning of the cold-start UDDS cycle.

5.4 Determination of Urban All-Electric Range, Urban Equivalent All-Electric Range, and Urban Charge-Depleting Emissions for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

5.4.1 The **Urban All-Electric Range** shall be defined as the distance that the vehicle is driven from the start of Urban Charge-Depleting Emission Test until the engine first starts in accordance with section G.5.4.2.1. Record the SOC when the engine first starts. The Urban Charge-Depleting Emission Test is performed with the vehicle initially at full state-of-charge. When emission testing a vehicle in a driver-selectable mode other than default mode or normal mode, the distance of the Urban All-Electric Range, which occurs during the first portion of the Urban Charge-Depleting Emission Test, shall not be considered as certification urban all-electric range for the purposes of compliance with the requirements in section C.

5.4.1.1 **Urban Equivalent All-Electric Range** shall be calculated in accordance with section G.11.

5.4.2 Urban Charge-Depleting Emission Test.

To be conducted pursuant to 40 CFR §1066.815 with the following revisions:

5.4.2.1 Amend subparagraph (a): *General*. The Urban Charge-Depleting Emission Test consists of the Urban All-Electric Range Test, a cold-start UDDS cycle when the engine starts followed by a 10-minute key off soak and hot-start UDDS cycle(s) as described in section G.5.1.3. The Continuous Urban Test Schedule is used for the Urban Charge-Depleting Emission Test. If driver-selectable modes are available that can be appropriately tested with charge-depleting operation, then test the appropriate driver-selectable mode(s) as required for the Urban Charge-Depleting Emission Test to determine worst case emissions as described in the introductory paragraphs of section G.5. The Alternative Continuous Urban Test Schedule may be substituted for the Continuous Urban Test Schedule if the test facility is unable to perform the Continuous Urban Test Schedule. Refer to sections G.5.5, G.5.6, and G.11, for calculations of urban exhaust emissions, urban particulate emissions, and equivalent all-electric range, respectively. Emissions shall be measured for all test cycles when the engine is operating. For each test cycle during which emissions are not generated, emissions are not required to be sampled. However, the manufacturer must validate that the engine did not turn on at any time during the test cycle. If the engine starts operating toward the end of the cold-start UDDS cycle such that the vehicle does not achieve full warm-up conditions prior to the subsequent hot-start UDDS cycle, an additional hot-start UDDS cycle may be performed following the first hot-start UDDS cycle and be included in the hot-start mass summations Σm_h in the equation of section 5.5.1.2

and $\Sigma m_{PM-hUDDS}$ of the equation in section 5.6.1.2(1) along with the associated distance summations ΣD_h .

5.4.2.2 Amend subparagraph (b): *PM sampling options*. Collect PM using the procedures specified in subparagraphs (b)(1) or (b)(2) or (b)(5) of 40 CFR §1066.815 (subparagraphs (b)(3) and (b)(4) are not applicable) and use the corresponding equation in section G.5.6 to calculate composite PM emissions. Testing must meet the requirements related to filter face velocity as described in 40 CFR §1065.170(c)(1)(vi) [April 28, 2014], except as specified in paragraph (b)(5) of 40 CFR §1066.815. For procedures involving flow weighting, set the filter face velocity to a weighting target of 1.0 to meet the requirements of 40 CFR §1065.170(c)(1)(vi) [April 28, 2014]. Allow filter face velocity to decrease as a percentage of the weighting factor if the weighting factor is less than 1.0. Use the appropriate equations in 40 CFR §1066.610 to show that you meet the dilution factor requirements of 40 CFR §1066.110(b)(2)(iii)(B).

5.4.2.3 Amend subparagraphs (b)(1): A separate PM sample for transient and stabilized phases of the cold-start UDDS cycle and the hot-start UDDS cycle may be collected. This may be done by sampling with four filters.

5.4.2.4 Subparagraph (b)(2). [No change.]

5.4.2.5 Delete subparagraphs (b)(3) and (b)(4).

5.4.2.6 Subparagraphs (b)(5) through (c)(2). [No change.]

5.4.2.7 Delete subparagraph (c)(3).

5.4.2.8 Amend subparagraph (d): *Test sequence*. Follow the exhaust emission measurement procedures specified in 40 CFR §1066.410 through §1066.425, subject to the following exceptions and additional provisions:

5.4.2.9 Subparagraph (d)(1). [No change.]

5.4.2.10 Amend subparagraph (d)(1)(i): Precondition the vehicle as described in section G.5.2. Initiate the cold-start Urban Charge-Depleting Emission Test in the appropriate driver-selectable mode to be tested following the 12 to 36 hour soak period.

5.4.2.11 Subparagraphs (d)(1)(ii) and (d)(1)(iii). [No change.]

5.4.2.12 Amend subparagraph (d)(1)(iv): Five seconds after the vehicle is turned off, stop all stabilized interval sampling and recording, including background sampling. Stop any integrating devices for the stabilized interval and indicate the end of the stabilized interval in the recorded data. Note that the 5 second delay is intended to account for sampling system transport.

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

5.4.2.14 Amend subparagraph (d)(2)(i): Initiate the hot-start UDDS cycle (9 to 11) minutes after the end of the sample period for the cold-start UDDS cycle.

5.4.2.15 Amend subparagraph (d)(2)(ii): Repeat the steps in paragraph (d)(1)(ii) of this section.

5.4.2.16 Amend subparagraph (d)(2)(iii): For bag 4 measurement or single bag per UDDS cycle measurement, operate the vehicle over the remainder of the UDDS and conclude the testing as described in subparagraphs (d)(1)(iii) and (iv) of this section.

5.4.2.17 Amend subparagraph (3): **End-of-Test Criteria.** A valid test shall satisfy the SOC Net Energy Change Tolerances in section G.10. For PHEVs that use a battery as an energy storage device, $(\text{Amp-hr}_{\text{initial}})$ is the stored charge at the beginning of the cold-start UDDS cycle, and $(\text{Amp-hr}_{\text{final}})$ is the stored battery charge at the end of the next hot-start UDDS cycle immediately following the cold-start UDDS cycle. The final stored battery charge, $(\text{Amp-hr}_{\text{final}})$, shall not exceed either $(\text{Amp-hr}_{\text{final}})_{\text{max}}$ or $(\text{Amp-hr}_{\text{final}})_{\text{min}}$ for a valid test. For PHEVs that use a capacitor as an energy storage device, (V^2_{initial}) is the square of the capacitor voltage stored at the beginning of the cold-start UDDS cycle, and (V_{final}) is the stored capacitor voltage at the end of the next hot-start UDDS cycle immediately following the cold-start UDDS cycle. The final stored capacitor voltage, (V_{final}) , shall not exceed either $(V_{\text{final}})_{\text{max}}$ or $(V_{\text{final}})_{\text{min}}$ for a valid test. For PHEVs that use an electro-mechanical flywheel as an energy storage device, $(\text{rpm}^2_{\text{initial}})$ is the squared flywheel rotational speed at the beginning of the cold-start UDDS cycle, and $(\text{rpm}_{\text{final}})$ is the flywheel rotational speed at the end of the next hot-start UDDS cycle immediately following the cold-start UDDS cycle. The final flywheel rotational speed, $(\text{rpm}_{\text{final}})$, shall not exceed either $(\text{rpm}_{\text{final}})_{\text{max}}$ or $(\text{rpm}_{\text{final}})_{\text{min}}$ for a valid test.

5.4.3 **Additional End-of-Test Criteria.** With approval from the Executive Officer, if the SOC Net Energy Change Tolerance is not satisfied after the hot-start UDDS cycle in section G.5.4.2.17, an Urban Charge-Depleting Emission Test may be considered valid if:

5.4.3.1 The alternative End-of-Test criteria in Section 3.9 or Section 3.9.1 of SAE J1711 are satisfied; or

5.4.3.2 The SOC at the end of the hot-start UDDS cycle is higher than the SOC at the beginning of the cold-start UDDS cycle.

5.4.4 Vehicle charging after testing. Vehicle charging shall begin within three hours after the charge depleting emission test, and the vehicle shall be charged to the manufacturer specified full state-of-charge. During charging, all applicable requirements in section G.3 must be met, and energy consumption shall be calculated pursuant to the requirements in section G.11.7.

5.4.5 Alternative Urban Charge-Depleting Emission Test.

A vehicle with an Urban All-Electric Range that is equal to or greater than four UDDS cycles and has an AER/EAER ratio that is equal to or greater than 0.98 may demonstrate compliance with applicable exhaust emission standards using this section G.5.4.5 in lieu of sections G.5.3 and G.5.4.2. The AER and EAER values used to calculate the AER/EAER ratio must each contain three significant figures after the decimal point. Rounding the calculated AER/EAER ratio up to 0.98 is prohibited. Use of the Alternative Urban Charge-Depleting Emission Test must be approved in advance by the Executive Officer.

For the purpose of measuring vehicle emissions, subparagraphs 5.4.5(i) and (ii) must be performed during the initial Alternative Urban Charge-Depleting Emission Test to determine urban all-electric range; these sections may be omitted during any subsequent Alternative Urban Charge-Depleting Emission Tests.

(i) The vehicle shall be charged to full state-of-charge.

(ii) **Dynamometer run to determine Urban All-Electric Range.** The vehicle shall be placed or pushed onto a chassis dynamometer and operated through the Continuous Urban Test Schedule or the Alternative Continuous Urban Test Schedule with the vehicle in default mode or in normal mode if the vehicle does not have default mode. When the engine first starts, record SOC, and continue driving until charge-sustaining operation is achieved. As an option, emissions may be measured so the full Urban Charge-Depleting Emission Test as described in section G.5.4.2 may be used to determine urban charge-depleting emissions for vehicles operating in default or normal mode. If this option is used, vehicle preconditioning according to section G.5.2 must be performed prior to this section G.5.4.5(ii). To determine the Urban Equivalent All-Electric Range for the TZEV Allowance in section C.3.3(a), the full Urban Charge-Depleting Emission Test option shall be performed and the Urban Equivalent All-Electric Range calculated in accordance with section G.11.

(iii) **Vehicle preconditioning.** The vehicle shall be preconditioned according to section G.5.2.

(iv) **Dynamometer run to determine Urban Emissions.** After the cold soak period, using the engine start SOC data from the previous section

G.5.4.5(ii), set the SOC so that the engine starts at or before the first 45 seconds of the cold-start UDDS cycle. The SOC shall not be set below the normal operating SOC threshold of the vehicle as observed during the UDDS cycle when driving in default mode or in normal mode if the vehicle does not have default mode. If testing a vehicle in driver-selectable, charge-increasing mode: first set SOC in accordance with the conditions set forth in the first two sentences of this section G.5.4.5(iv) with the vehicle in default mode or in normal mode if the vehicle does not have default mode, then activate the charge-increasing mode at the start of the cold-start UDDS cycle. For all tests, the engine must start at or before the first 45 seconds of the cold-start UDDS cycle to be valid.

(v) The vehicle shall be placed or pushed onto a dynamometer and operated through a cold-start UDDS cycle followed by a 10 minute key-off soak and then a hot-start UDDS cycle. At the completion of the hot-start UDDS cycle, the test is completed. For additional testing information, the testing parameters for the Urban Charge-Sustaining Emission Test in section G.5.3 are applicable. However, the Alternative Urban Charge-Depleting Emission Test does not require satisfying the SOC Net Energy Change Tolerance to be a valid test.

(vi) Refer to sections G.5.5 and G.5.6, for calculating urban gaseous emissions and urban particulate emissions, respectively.

(vii) **Optional vehicle charging after testing.** Vehicle may be fully charged following the Urban All-Electric Range Test in section G.5.4.5(ii). If this option is performed, vehicle charging shall begin within three hours after completing the Urban All-Electric Range Test in section G.5.4.5(ii), and the vehicle shall be charged to the manufacturer specified full state-of-charge. During charging, all applicable requirements in section G.3 must be met, and energy consumption shall be calculated pursuant to the requirements in section G.11.7.

5.5 Calculations – Urban Gaseous Emissions for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

5.5.1 Urban Charge-Depleting Gaseous Emissions Calculations.

To be conducted pursuant to 40 CFR §1066.820 [April 28, 2014] with the following revisions:

5.5.1.1 Subparagraph (a). [No change.]

5.5.1.2 Amend subparagraph (b): Calculate the final composite gaseous test results as a mass-weighted value, $e_{\text{[emission]}\text{-FTPcomp}}$, in grams per mile using the following equation:

$$e_{[\text{emission}]\text{-FTP}_{\text{eomp}}} = 0.43 \left(\frac{m_e}{D_e} \right) + 0.57 \left(\frac{\Sigma m_h}{\Sigma D_h} \right)$$

Where:

m_c = the mass emissions determined from the cold-start UDDS cycle, in grams. If the cold-start UDDS cycle consists of phase 1 cold transient emissions and phase 2 cold stabilized emissions, then sum phase 1 and phase 2 emissions to determine m_c .

D_c = the measured driving distance from the cold-start UDDS cycle, in miles. If the cold-start UDDS cycle consists of phase 1 distance and phase 2 distance, then sum phase 1 and phase 2 distances to determine D_c .

Σm_h = the summation of the mass emissions determined from each hot-start UDDS cycle, in grams. If a hot-start UDDS cycle consists of phase 3 hot transient emissions and phase 4 hot stabilized emissions, then sum phase 3 and phase 4 emissions to determine m_h for the each hot-start UDDS cycle.

ΣD_h = the summation of the driving distances from each hot-start UDDS cycle, in miles. If a hot-start UDDS cycle consists of phase 3 distance and phase 4 distance, then sum phase 3 and phase 4 distances to determine D_h for each hot-start UDDS cycle.

5.5.1.3 Subparagraphs (c). [Not applicable.]

5.5.2 Urban Charge-Sustaining Gaseous Emissions Calculations.

To be conducted pursuant to 40 CFR §1066.820 [April 28, 2014] with the following revisions:

5.5.2.1 Subparagraph (a). [No change.]

5.5.2.2 Amend subparagraph (b): Calculate the final composite gaseous test results as a mass-weighted value, $e_{[\text{emission}]\text{-FTP}_{\text{comp}}}$, in grams per mile using the following equation:

$$e_{[\text{emission}]\text{-FTP}_{\text{comp}}} = 0.43 \left(\frac{m_e}{D_e} \right) + 0.57 \left(\frac{m_h}{D_h} \right)$$

Where:

m_c = the mass emissions determined from the cold-start UDDS cycle, in grams. If the cold-start UDDS cycle consists of phase 1 cold transient emissions and phase 2 cold stabilized emissions, then sum phase 1 and phase 2 emissions to determine m_c .

D_c = the measured driving distance from the cold-start UDDS cycle, in miles. If the cold-start UDDS cycle consists of phase 1 distance and phase 2 distance, then sum phase 1 and phase 2 distances to determine D_c .

m_h = the mass emissions determined from the hot-start UDDS cycle, in grams. If the hot-start UDDS cycle consists of phase 3 hot transient emissions and phase 4 hot stabilized emissions, then sum phase 3 and phase 4 emissions to determine m_h .

D_h = the driving distance from the hot-start UDDS cycle, in grams. If the hot-start UDDS cycle consists of phase 3 distance and phase 4 distance, then sum phase 3 and phase 4 distances to determine D_h .

5.5.2.3 Subparagraph (c). [Not applicable.]

5.6 Calculations - Urban Particulate Emissions for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

5.6.1 Urban Charge-Depleting Particulate Emissions Calculations.

To be conducted pursuant to 40 CFR §1066.820 with the following revisions:

5.6.1.1 Subparagraph (a) to (b). [Not applicable.]

5.6.1.2 Amend subparagraphs (c) through (c)(1): Calculate the final composite PM test results as a mass-weighted value, $e_{PM-FTPcomp}$, in grams per mile as follows:

(1) Use the following equation for PM measured as described in §1066.815(b)(1) or (2):

$$e_{PM-FTPcomp} = 0.43 \left(\frac{m_{PM-eUDDS}}{D_e} \right) + 0.57 \left(\frac{\Sigma m_{PM-hUDDS}}{\Sigma D_h} \right)$$

Where:

$m_{PM-cUDDS}$ = the combined PM mass emissions determined from the cold-start UDDS cycle (phase 1 and phase 2), in grams, as calculated using Eq. 1066.605-2.

D_c = the measured driving distance from the cold-start UDDS cycle, in miles. If the cold-start UDDS cycle consists of phase 1 distance and phase 2 distance, then sum phase 1 and phase 2 distances to determine D_c .

$\Sigma m_{PM-hUDDS}$ = the summation of the PM mass emissions determined from each hot-start UDDS cycle, in grams, as calculated using Eq. 1066.605-2. If a hot-start UDDS cycle consists of phase 3 hot transient emissions and phase 4 hot stabilized emissions, then sum phase 3 and phase 4 emissions to determine $m_{PM-hUDDS}$ for the each hot-start UDDS cycle.

ΣD_h = the summation of the driving distances from each hot-start UDDS cycle, in miles. If a hot-start UDDS cycle consists of phase 3 distance and phase 4 distance, then sum phase 3 and phase 4 distances to determine D_h for each hot-start UDDS cycle.

5.6.1.3 Subparagraph (c)(2). [Not applicable.]

5.6.1.4 Amend subparagraph (c)(3): Use the following equation for PM measured as described in §1066.815(b)(5):

$$e_{PM-FTP_{eomp}} = \frac{m_{PM}}{0.43(D_e) + 0.57(D_h)}$$

Where:

m_{PM} = the combined PM mass emissions determined from the cold-start UDDS cycle and the hot-start UDDS cycle (phase 1, phase 2, phase 3, and phase 4), in grams, as calculated using Eq. 1066.605-4.

D_c = the measured driving distance from the cold-start UDDS cycle, in miles. If the cold-start UDDS cycle consists of phase 1 distance and phase 2 distance, then sum phase 1 and phase 2 distances to determine D_c .

D_h = the driving distance from the hot-start UDDS cycle, in grams. If the hot-start UDDS cycle consists of phase 3 distance and phase 4 distance, then sum phase 3 and phase 4 distances to determine D_h .

5.6.2 Urban Charge-Sustaining Particulate Emissions Calculations.

To be conducted pursuant to 40 CFR §1066.820 with the following revisions:

5.6.2.1 Subparagraphs (a) to (b). [Not applicable.]

5.6.2.2 Amend subparagraphs (c) through (c)(1): Calculate the final composite PM test results as a mass-weighted value, $e_{\text{PM-FTPcomp}}$, in grams per mile as follows:

(1) Use the following equation for PM measured as described in §1066.815(b)(1) or (2):

$$e_{\text{PM-FTPcomp}} = 0.43 \left(\frac{m_{\text{PM-cUDDS}}}{D_e} \right) + 0.57 \left(\frac{m_{\text{PM-hUDDS}}}{D_h} \right)$$

Where:

$m_{\text{PM-cUDDS}}$ = the combined PM mass emissions determined from the cold-start UDDS cycle (phase 1 and phase 2), in grams, as calculated using Eq. 1066.605-2.

D_c = the measured driving distance from the cold-start UDDS cycle, in miles. If the cold-start UDDS cycle consists of phase 1 distance and phase 2 distance, then sum phase 1 and phase 2 distances to determine D_c .

$m_{\text{PM-hUDDS}}$ = the combined PM mass emissions determined from the hot-start UDDS cycle (phase 3 and phase 4), in grams, as calculated using Eq. 1066.605-2.

D_h = the driving distance from the hot-start UDDS cycle, in grams. If the hot-start UDDS cycle consists of phase 3 distance and phase 4 distance, then sum phase 3 and phase 4 distances to determine D_h .

5.6.2.3 Subparagraph (c)(2). [Not applicable.]

5.6.2.4 Amend subparagraph (c)(3): Use the following equation for PM measured as described in §1066.815(b)(5):

$$e_{\text{PM-FTPcomp}} = \frac{m_{\text{PM}}}{0.43(D_e) + 0.57(D_h)}$$

Where:

m_{PM} = the combined PM mass emissions determined from the cold-

start UDDS cycle and the hot-start UDDS cycle (phase 1, phase 2, phase 3, and phase 4), in grams, as calculated using Eq. 1066.605-4.

D_c = the measured driving distance from the cold-start UDDS cycle, in miles. If the cold-start UDDS cycle consists of phase 1 distance and phase 2 distance, then sum phase 1 and phase 2 distances to determine D_c .

D_h = the driving distance from the hot-start UDDS cycle, in grams. If the hot-start UDDS cycle consists of phase 3 distance and phase 4 distance, then sum phase 3 and phase 4 distances to determine D_h .

6. Highway Emission Test Provisions for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

To be conducted pursuant to 40 CFR §1066.801, except as noted.

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.

For the purpose of determining Highway All-Electric Range and Highway Equivalent All-Electric Range, the vehicle shall be range tested in default mode or in normal mode if the vehicle does not have a default mode.

For the purpose of demonstrating compliance with exhaust emission standards, a vehicle must be emission tested in the vehicle operation (i.e., either charge-sustaining or charge-increasing operation) that represents the worst case highway NMOG + NOx emissions.

Vehicles with one or more driver-selectable modes (e.g., normal mode, economy mode, performance mode, battery charging mode, or any other operating mode available to the driver) for a given charge-sustaining or charge-increasing operation (if available) must be emission tested in the one driver-selectable mode and vehicle operation (i.e., charge-sustaining, charge-increasing) which represents the worst case highway NMOG + NOx emissions. For example, if a vehicle has two driver-selectable modes that can be tested in charge-sustaining and charge-increasing operations, the manufacturer shall determine worst case highway emissions of NMOG + NOx by comparing the following (1) mode 1 charge-sustaining emissions, (2) mode 2 charge-sustaining emissions, (3) mode 1 charge-increasing emissions, and (4) mode 2 charge-increasing emissions based on the Highway Emission Test.

In lieu of demonstrating the worst case highway NMOG + NOx emissions by certification testing in every highway charge-sustaining driver-selectable mode and every highway charge-increasing (if available) driver-selectable mode, a manufacturer

may determine the worst case operating mode by using non-certification emission data and/or an engineering evaluation. The manufacturer must report the data and/or engineering evaluation used to determine the worst case operating mode. The manufacturer must demonstrate compliance with all applicable emission standards using test data for the worst case operating mode.

Confirmatory testing and/or in-use compliance testing may be performed in any driver-selectable mode charge-sustaining or charge-increasing operation (if available) to ensure compliance with emission standards.

6.1 Determination of Highway All-Electric Range, Highway Equivalent All-Electric Range, and Highway Emissions for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

6.1.1 The **Highway All-Electric Range** shall be defined as the distance that the vehicle is driven from the start of the Highway Charge-Depleting Range Test until the engine first starts. The Highway Charge-Depleting Range Test is performed with the vehicle initially at full state-of-charge and in default mode or in normal mode if the vehicle does not have a default mode.

6.1.2 Highway Charge Depleting Range Test.

(i) **Dynamometer run.** Starting at full state-of-charge, the vehicle shall be placed or pushed, onto a dynamometer and operated through the Continuous Highway Test Schedule until the SOC Net Energy Change Tolerances (specified in section G.10 of these test procedures) that indicate charge sustaining operation are met for one HFEDS cycle. Additional End-of-Test Criteria as provided for in the Urban Charge-Depleting Emission Test in sections G.5.4.3.1 and G.5.4.3.2 may be used for the Highway Charge-Depleting Range Test with approval from the Executive Officer. The Alternative Continuous Highway Test Schedule may be substituted for the Continuous Highway Test Schedule if the test facility is unable to perform the Continuous Highway Test Schedule. Emissions shall be measured for all test cycles when the engine is operating. For each test cycle during which emissions are not generated, emissions are not required to be sampled. However, the manufacturer must validate that the engine did not turn on at any time during the test cycle.

(ii) **Vehicle charging after testing.** Vehicle charging shall begin within three hours after the Highway Charge Depleting Range Test and the vehicle shall be charged to the manufacturer specified full state-of-charge. During charging, all applicable requirements in section G.3 must be met, and energy consumption shall be calculated according to the requirements in section G.11.7.

6.1.3 **Equivalent All-Electric Range** shall be calculated in accordance with section G.11.

6.1.4 Highway Emission Test.

To be conducted pursuant to 40 CFR §1066.840 with the following revisions:

6.1.4.1 Amend subparagraph (a): Perform the Highway Emission Test immediately following any of the urban emission tests, the Highway Charge-Depleting Range Test, or a previous Highway Emission Test when this is practical. If the Highway Emission Test starts more than 3 hours after any of the urban emission tests (including evaporative emission measurements, if applicable), Highway Charge-Depleting Range Test, or a previous Highway Emission Test, operate the vehicle over one UDDS cycle in charge-sustaining operation to precondition the vehicle. If driver-selectable modes are available, do not activate the driver-selectable mode to be tested for the UDDS preconditioning drive, but set the vehicle in default mode or normal mode for the UDDS preconditioning drive with the vehicle in charge-sustaining operation. Additional preconditioning UDDS cycles may be approved in advance by Executive Officer if the need for additional preconditioning is demonstrated by the manufacturer.

6.1.4.2 Amend subparagraph (b): Operate the vehicle over the HFEDS cycle in charge-sustaining operation for preconditioning. If driver-selectable modes are available, do not activate the driver-selectable mode to be tested for the preconditioning drive, but set the vehicle in default mode or normal mode for the preconditioning drive with the vehicle in charge-sustaining operation. If, however, the vehicle is to be tested in charge-increasing operation (this does not apply to a driver-selectable charge-increasing mode), then the initial SOC shall be set at the lowest normal SOC level allowed by the vehicle when driving on the UDDS cycle. After the preconditioning drive, allow the vehicle to idle for 15 seconds (with the vehicle in gear), then start a repeat run of the HFEDS cycle and simultaneously start sampling and recording. If a driver-selectable mode is to be tested after the preconditioning drive, allow the vehicle to idle for 15 seconds (with the vehicle in gear), activate the driver-selectable mode to be tested, then start a repeat run of the HFEDS cycle and simultaneously start sampling and recording. End-of-Test Criterion: A valid test shall satisfy the SOC Net Energy Change Tolerances in section G.10 for the HFEDS cycle with emission sampling. For PHEVs that use a battery as an energy storage device, $(\text{Amp-hr}_{\text{initial}})$ is the stored charge at the beginning of the HFEDS cycle with emission sampling, and $(\text{Amp-hr}_{\text{final}})$ is the stored battery charge at the end of the same HFEDS cycle with emission sampling. The final stored battery charge, $(\text{Amp-hr}_{\text{final}})$, shall not exceed either $(\text{Amp-hr}_{\text{final}})_{\text{max}}$ or $(\text{Amp-hr}_{\text{final}})_{\text{min}}$ for a valid test. For PHEVs that use a capacitor as an energy storage device, (V^2_{initial}) is the square of the capacitor voltage stored at the beginning of the HFEDS cycle with emission sampling, and (V_{final}) is the stored capacitor voltage at the end of the same HFEDS cycle with emission sampling. The final stored capacitor voltage,

(V_{final}), shall not exceed either (V_{final})_{max} or (V_{final})_{min} for a valid test. For PHEVs that use an electro-mechanical flywheel as an energy storage device, ($\text{rpm}^2_{\text{initial}}$) is the squared flywheel rotational speed at the beginning of the HFEDS cycle with emission sampling, and ($\text{rpm}_{\text{final}}$) is the flywheel rotational speed at the end of the same HFEDS cycle with emission sampling. The final flywheel rotational speed, ($\text{rpm}_{\text{final}}$), shall not exceed either ($\text{rpm}_{\text{final}}$)_{max} or ($\text{rpm}_{\text{final}}$)_{min} for a valid test.

6.1.4.3 Amend subparagraph (c): Turn the vehicle off at the end of the final HFEDS cycle and stop all sampling and recording, including background. Stop any integrating devices and indicate the end of the test cycle in the recorded data.

6.1.5 Additional End-of-Test Criterion. With approval from the Executive Officer, if the SOC Net Energy Change Tolerance is not satisfied for the HFEDS cycle with emission sampling in section G.6.1.4.2, a Highway Emission Test may be considered valid if:

6.1.5.1 The alternative End-of-Test criterion of $\pm 5\%$ SOC Net Energy Change Tolerance in Appendix C of SAE J1711 is satisfied (Note: Appendix C of SAE J1711 may not be used to correct measured values for any emissions.); or

6.1.5.2 The SOC at the end of the HFEDS cycle with emission sampling is higher than the SOC at the beginning of the same HFEDS cycle with emission sampling.

7. SFTP Emission Test Provisions for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

To be conducted pursuant to 40 CFR §1066.801, except as noted.

Alternative procedures may be used if approved in advance by the Executive Officer of the Air Resources Board.

For the purpose of determining US06 all electric range capability as required in section C.3.3(a)(1), a vehicle shall be range tested in default mode or in normal mode if the vehicle does not have a default mode in accordance with section G.7.3.

For the purpose of demonstrating compliance with exhaust emission standards, a vehicle must be emission tested in the vehicle operation (i.e., either charge-sustaining or charge-increasing operation) that represents the worst case SFTP NMOG + NOx emissions.

Vehicles with one or more driver-selectable modes (e.g., normal mode, economy mode, performance mode, battery charging mode, or any other operating mode available to the driver) for a given charge-sustaining or charge-increasing operation (if available) must be emission tested in the one driver-selectable mode and vehicle

operation (i.e., charge-sustaining, charge-increasing) which represents the worst case SFTP NMOG + NOx emissions. For example, if a vehicle has two driver-selectable modes that can be tested in charge-sustaining and charge-increasing operations, the manufacturer shall determine worst case SFTP NMOG + NOx emissions by comparing the following (1) mode 1 charge-sustaining emissions, (2) mode 2 charge-sustaining emissions, (3) mode 1 charge-increasing emissions, and (4) mode 2 charge-increasing emissions based on the US06 Emission Test and SC03 Emission Test.

In lieu of demonstrating the worst case SFTP NMOG + NOx emissions by certification testing in every SFTP charge-sustaining driver-selectable mode and every SFTP charge-increasing (if available) driver-selectable mode, a manufacturer may determine the worst case operating mode by using non-certification emission data and/or an engineering evaluation. The manufacturer must report the data and/or engineering evaluation used to determine the worst case operating mode. The manufacturer must demonstrate compliance with all applicable emission standards using test data for the worst case operating mode.

Confirmatory testing and/or in-use compliance testing may be performed in any driver-selectable mode in charge-sustaining or charge-increasing operation to ensure compliance with emission standards.

7.1 US06 Emission Test.

To be conducted pursuant to 40 CFR §1066.831 with the following revisions:

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

7.1.2 Amend subparagraph (b)(1)(i): For aggressive-driving tests that do not follow any urban emission test or the Highway Emission Test.

7.1.3 Amend subparagraph (b)(1)(ii): For a test element that starts more than 72 hours after any most recent urban emission test or the Highway Emission Test (with or without evaporative emission measurements).

7.1.4 Amend subparagraph (b)(1)(iii): For testing in which the test vehicle has not remained in an area where ambient temperatures were within the range specified for testing since any previous urban emission test or the Highway Emission Test.

7.1.5 Subparagraphs (b)(2) through (b)(3)(i). [No change.]

7.1.6 Amend subparagraph (b)(3)(ii): Operate the vehicle one time over one of the driving schedules specified in this paragraph (b)(3)(ii). A particular preconditioning driving schedule that is related to fuel effects on adaptive memory systems may be requested. The vehicle shall be in charge-sustaining operation for this preconditioning drive. If driver-selectable modes are available, do not activate

the driver-selectable mode to be tested for the preconditioning drive, but set the vehicle in default mode or normal mode for the preconditioning drive with the vehicle in charge-sustaining operation. If, however, the vehicle is to be tested in charge-increasing operation (this does not apply to a driver-selectable charge-increasing mode), then the initial SOC shall be set at the lowest normal SOC level allowed by the vehicle when driving on the UDDS cycle. Sampling equipment may be exercised, but emissions may not be determined during preconditioning. Choose from the following driving schedules:

7.1.7 Subparagraphs (b)(3)(ii)(A) through (b)(3)(ii)(B). [No change.]

7.1.8 Amend subparagraph (b)(3)(ii)(C): The HFEDS cycle.

7.1.9 Subparagraphs (b)(3)(ii)(D) through (e). [No change.]

7.1.10 Amend subparagraph (e)(1): Following the preconditioning specified in paragraph (b) of this section, place the vehicle in gear and simultaneously start sampling and recording. If a driver-selectable mode is to be tested following the preconditioning, activate the driver-selectable mode, place the vehicle in gear, and simultaneously start sampling and recording. Begin the first acceleration 5 seconds after placing the vehicle in gear.

7.1.11 Subparagraphs (e)(2) through (e)(2)(iii). [No change.]

7.1.12 Amend subparagraph (e)(3): Turn the vehicle off 2 seconds after the end of the last deceleration. Five seconds after the vehicle stops running, stop all sampling and recording, including background sampling. Stop any integrating devices and indicate the end of the test cycle in the recorded data. Note that the 5 second delay is intended to account for sampling system transport. End-of-Test Criterion: A valid test shall satisfy the SOC Net Energy Change Tolerances in section G.10 for the US06 cycle with emission sampling. For PHEVs that use a battery as an energy storage device, $(\text{Amp-hr}_{\text{initial}})$ is the stored charge at the beginning of the US06 cycle with emission sampling, and $(\text{Amp-hr}_{\text{final}})$ is the stored battery charge at the end of the same US06 cycle with emission sampling. The final stored battery charge, $(\text{Amp-hr}_{\text{final}})$, shall not exceed either $(\text{Amp-hr}_{\text{final}})_{\text{max}}$ or $(\text{Amp-hr}_{\text{final}})_{\text{min}}$ for a valid test. For PHEVs that use a capacitor as an energy storage device, (V^2_{initial}) is the square of the capacitor voltage stored at the beginning of the US06 cycle with emission sampling, and (V_{final}) is the stored capacitor voltage at the end of the same US06 cycle with emission sampling. The final stored capacitor voltage, (V_{final}) , shall not exceed either $(V_{\text{final}})_{\text{max}}$ or $(V_{\text{final}})_{\text{min}}$ for a valid test. For PHEVs that use an electro-mechanical flywheel as an energy storage device, $(\text{rpm}^2_{\text{initial}})$ is the squared flywheel rotational speed at the beginning of the US06 cycle with emission sampling, and $(\text{rpm}_{\text{final}})$ is the flywheel rotational speed at the end of the same US06 cycle with emission sampling. The final flywheel rotational speed, $(\text{rpm}_{\text{final}})$, shall not exceed either $(\text{rpm}_{\text{final}})_{\text{max}}$ or $(\text{rpm}_{\text{final}})_{\text{min}}$ for a valid test.

7.1.13 Subparagraph (e)(4). [No change.]

7.1.14 **Additional End-of-Test Criterion.** With approval from the Executive Officer, if the SOC Net Energy Change Tolerance is not satisfied for the US06 cycle with emission sampling in section G.7.1.12, a US06 Emission Test may be considered valid if:

7.1.14.1 The alternative End-of-Test criterion of $\pm 5\%$ SOC Net Energy Change Tolerance in Appendix C of SAE J1711 is satisfied (Note: Appendix C of SAE J1711 may not be used to correct measured values for any emissions.); or

7.1.14.2 The SOC at the end of the US06 cycle with emission sampling is higher than the SOC at the beginning of the same US06 cycle with emission sampling.

7.2 SC03 Emission Test.

To be conducted pursuant to 40 CFR §1066.835 with the following revisions:

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

7.2.2 Amend subparagraph (c)(5): Perform a preconditioning drive by operating the test vehicle in charge-sustaining operation over the first 505 seconds of the UDDS cycle (phase 1), the last 867 seconds of the UDDS cycle (phase 2), or the SC03 driving schedule. If driver-selectable modes are available, do not activate the driver-selectable mode to be tested for the preconditioning drive, but set the vehicle in default mode or normal mode for the preconditioning drive with the vehicle in charge-sustaining operation. If, however, the vehicle is to be tested in charge-increasing operation (this does not apply to a driver-selectable charge-increasing mode), then the initial SOC shall be set at the lowest normal SOC level allowed by the vehicle when driving on the UDDS cycle. If the air conditioning test sequence starts more than 2 hours after a different exhaust emission test, the vehicle may be driven over one full UDDS cycle for the preconditioning drive instead of over one of the cycles listed previously in this section (c)(5).

7.2.3 Subparagraphs (c)(6) through (d). [No change.]

7.2.4 Amend subparagraph (d)(1): Place the vehicle in gear 15 seconds after starting vehicle, which is 3 seconds before the first acceleration. If a driver-selectable mode is to be tested, start the vehicle, activate the driver-selectable mode, and place the vehicle in gear 15 seconds after starting vehicle. Follow the SC03 driving schedule.

7.2.5 Amend subparagraph (d)(2): Turn the vehicle off 2 seconds after the end of the last deceleration. Five seconds after the vehicle stops running, stop all sampling and recording, including background sampling. Stop any integrating

devices and indicate the end of the test cycle in the recorded data. Note that the 5 second delay is intended to account for sampling system transport. End-of-Test Criterion: A valid test shall satisfy the SOC Net Energy Change Tolerances in section G.10 for the SC03 cycle with emission sampling. For PHEVs that use a battery as an energy storage device, $(\text{Amp-hr}_{\text{initial}})$ is the stored charge at the beginning of the SC03 cycle with emission sampling, and $(\text{Amp-hr}_{\text{final}})$ is the stored battery charge at the end of the same SC03 cycle with emission sampling. The final stored battery charge, $(\text{Amp-hr}_{\text{final}})$, shall not exceed either $(\text{Amp-hr}_{\text{final}})_{\text{max}}$ or $(\text{Amp-hr}_{\text{final}})_{\text{min}}$ for a valid test. For PHEVs that use a capacitor as an energy storage device, (V^2_{initial}) is the square of the capacitor voltage stored at the beginning of the SC03 cycle with emission sampling, and (V_{final}) is the stored capacitor voltage at the end of the same SC03 cycle with emission sampling. The final stored capacitor voltage, (V_{final}) , shall not exceed either $(V_{\text{final}})_{\text{max}}$ or $(V_{\text{final}})_{\text{min}}$ for a valid test. For PHEVs that use an electro-mechanical flywheel as an energy storage device, $(\text{rpm}^2_{\text{initial}})$ is the squared flywheel rotational speed at the beginning of the SC03 cycle with emission sampling, and $(\text{rpm}_{\text{final}})$ is the flywheel rotational speed at the end of the same SC03 cycle with emission sampling. The final flywheel rotational speed, $(\text{rpm}_{\text{final}})$, shall not exceed either $(\text{rpm}_{\text{final}})_{\text{max}}$ or $(\text{rpm}_{\text{final}})_{\text{min}}$ for a valid test.

7.2.6 Subparagraphs (d)(3) through (f)(3)(iv). [No change.]

7.2.7 **Additional End-of-Test Criterion.** With approval from the Executive Officer, if the SOC Net Energy Change Tolerance is not satisfied for the SC03 cycle with emission sampling in section G.7.2.5, an SC03 Emission Test may be considered valid if:

7.2.7.1 The alternative End-of-Test criterion of $\pm 5\%$ SOC Net Energy Change Tolerance in Appendix C of SAE J1711 is satisfied (Note: Appendix C of SAE J1711 may not be used to correct measured values for any emissions.); or

7.2.7.2 The SOC at the end of the SC03 cycle with emission sampling is higher than the SOC at the beginning of the same SC03 cycle with emission sampling.

7.3 Optional Cold Start US06 All-Electric Range Test.

7.3.1 **Cold soak and vehicle charging.** 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 battery shall be charged to a full state-of-charge. The vehicle must be turned off during charging. Charge time shall not exceed soak time.

7.3.2 At the end of the cold soak period with the vehicle in default mode or in normal mode if the vehicle does not have a default mode, place or push the vehicle onto a dynamometer, and drive the vehicle on a continuous US06 test cycle until either:

- (a) the auxiliary power unit starts, or
- (b) the vehicle can no longer meet the speed trace limits of the US06 driving schedule as specified in CFR 86 Appendix I to within 2 mph higher than the highest point on the trace within 1 second for the upper limit or within 2 mph lower than the lowest point on the trace within 1 second for the lower limit.

When either of these conditions is met, the test shall be ended. The range for this test, in miles, shall be the distant driven from the start of the test to when condition (a) or (b) is met. Emission sampling is not required for this test.

8. 50°F and 20°F Test Provision for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

50°F testing shall be conducted pursuant to section G.5 with the modifications in Part II, Section D of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles” and the additional following revisions.

20°F testing shall be conducted pursuant to section G.5 with the modifications in Part II Section B or Part II Section C, as applicable, of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles” and the additional following revisions.

For 50°F and 20°F charge depleting testing, vehicle charging, prior to emissions testing, shall be performed during the soak period at 50°F and 20°F, respectively.

8.1 To satisfy test requirements for the 50°F emission test, a vehicle shall be emission tested in the vehicle operation and driver-selectable mode (if available) that represents the worst case urban NMOG + NO_x emissions as determined in section G.5. To satisfy test requirements for the 20°F emission test, a vehicle shall be emission tested in the vehicle operation and driver-selectable mode (if available) that represents the worst case CO emissions of the urban charge-depleting emission test or urban charge-sustaining emission test following the procedure outlined in section G.5. For the 20°F and 50°F emission tests, a vehicle is not required to meet SOC net energy change tolerances. If a vehicle qualifies for the Urban Alternative Charge-Depleting Emission Test, the 50°F and 20°F emission test shall be performed using the Alternative Charge-Depleting Emission Test in lieu of the urban charge-depleting emission test or urban charge-sustaining emission test.

8.2 If the worst case for emissions is charge sustaining operation, the vehicle shall be preconditioned, and one of the following two emission test options must be performed.

(i) A three phase test that includes phase one as the first 505 seconds of the UDDS cycle, phase two as 506 seconds to the end of the UDDS cycle, a 10 minute key-off soak period, and phase three the first 505 seconds of the UDDS cycle. The first two phases test shall be counted as the first UDDS cycle and the second and third phases will constitute the second UDDS cycle. Emission weighting is as follows:

$$Y_{wm} = 0.43 * \left(\frac{Y_1 + Y_2}{D_1 + D_2} \right) + 0.57 * \left(\frac{Y_2 + Y_3}{D_2 + D_3} \right)$$

Where:

Y_{wm} = Weighted mass emissions of each pollutant, i.e., THC, CO, THCE, NMOG, NMHCE, CH₄, NO_x, or CO₂, in grams per vehicle mile.

Y_1 = Mass emissions as calculated from phase one of the three phase test.

Y_2 = Mass emissions as calculated from phase two of the three phase test.

Y_3 = Mass emissions as calculated from phase three of the three phase test.

D_1 = The measured driving distance from phase one of the three phase tests, in miles.

D_2 = The measured driving distance from phase two of the three phase tests, in miles.

D_3 = The measured driving distance from phase three of the three phase tests, in miles.

(ii) A two phase test that includes phase one as a UDDS cycle, a 10 minute key-off soak period, and phase two as a UDDS cycle. Emission weighting for the four phase test will follow the procedure outlined in section G.5.5.

8.3 If measurement of worst case emissions requires the urban charge depleting emission test to be performed, the vehicle shall be preconditioned and fully charged. The continuous urban test schedule shall then be performed. The UDDS cycle, in which the auxiliary power unit first starts, shall be the cold UDDS cycle. Emissions shall be sampled according to one of the options in section G.8.2. For the three phase test option, if the auxiliary power unit starts in phase two of the UDDS cycle, phase one emissions are considered zero for emission calculation purposes. Emissions are weighted according to section G.8.2.

9. Additional Provisions.

9.1 Confirmatory testing may be performed on all tests to establish if higher emissions occur at different states-of-charge in charge depleting mode. This is to ensure that cold start and other emissions standards are not exceeded at other operating SOC's.

9.2 For an example of an off-vehicle charge capable hybrid electric vehicle with all-electric range and blended operation that has charge depleting actual range and charge depleting cycle range, please see section I, Figure 1.

9.3 For an example of charge depleting to charge sustaining range with and without transitional range and end of test conditions, please see section I, Figure 2.

9.4 When determining the SOC Net Energy Change tolerance during testing, the current drive cycle may be aborted if the SOC Net Energy Change tolerance is met for previous drive cycle.

9.5 If the manufacturer determines there is insufficient fuel to run the subsequent test, the manufacturer may perform a fuel drain and fill or add fuel pursuant to the provisions of the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles."

10. State-of-Charge Net Energy Change Tolerances for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

10.1 For vehicles that use a battery as an energy storage device, the following state-of-charge net energy change tolerance shall apply:

$$\left(\frac{NHV_{fuel} * m_{fuel}}{V_{system} * K_1} \right)_{\text{final max}} (\text{Amp-hr})_{\text{initial}} = (\text{Amp-hr}) + 0.01 * \left(\frac{NHV_{fuel} * m_{fuel}}{V_{system} * K_1} \right)$$

$$(\text{Amp-hr}_{\text{final}})_{\text{min}} = (\text{Amp-hr}_{\text{initial}}) - 0.01 * \left(\frac{NHV_{fuel} * m_{fuel}}{V_{system} * K_1} \right)$$

Where:

$(\text{Amp-hr}_{\text{final}})_{\text{max}}$	=	Maximum allowed Amp-hr stored in battery at the end of the test
$(\text{Amp-hr}_{\text{final}})_{\text{min}}$	=	Minimum allowed Amp-hr stored in battery at the end of the test
$(\text{Amp-hr}_{\text{initial}})$	=	Battery Amp-hr stored at the beginning of the test
NHV_{fuel}	=	Net heating value of consumable fuel, in Joules/kg
m_{fuel}	=	Total mass of fuel consumed during test, in kg
K_1	=	Conversion factor, 3600 seconds/hour

V_{system} = Open circuit voltage (OCV) that corresponds to the SOC of the target SOC during charge sustaining operation. This value shall be submitted for testing purposes, and it shall be subject to confirmation by the Air Resources Board.

10.2 For vehicles that use a capacitor as an energy storage device, the following state-of-charge net energy change tolerance shall apply:

$$(V_{\text{final}})_{\text{max}} = \sqrt{V_{\text{initial}}^2 + 0.01 * \frac{(2 * NHV_{\text{fuel}} * m_{\text{fuel}})}{C}}$$

$$(V_{\text{final}})_{\text{min}} = \sqrt{V_{\text{initial}}^2 - 0.01 * \frac{(2 * NHV_{\text{fuel}} * m_{\text{fuel}})}{C}}$$

Where:

$(V_{\text{final}})_{\text{max}}$ = The maximum stored capacitor voltage allowed at the end of the test

$(V_{\text{final}})_{\text{min}}$ = The minimum stored capacitor voltage allowed at the end of the test

V_{initial}^2 = The square of the capacitor voltage stored at the beginning of the test

NHV_{fuel} = Net heating value of consumable fuel, in Joules/kg

m_{fuel} = Total mass of fuel consumed during test, in kg

C = Rated capacitance of the capacitor, in Farads

10.3 For vehicles that use an electro-mechanical flywheel as an energy storage device, the following state-of-charge net energy change tolerance shall apply:

$$(\text{rpm}_{\text{final}})_{\text{max}} = \sqrt{\text{rpm}_{\text{initial}}^2 + 0.01 * \frac{(2 * NHV_{\text{fuel}} * m_{\text{fuel}})}{I * K_3}}$$

$$(\text{rpm}_{\text{final}})_{\text{min}} = \sqrt{\text{rpm}_{\text{initial}}^2 - 0.01 * \frac{(2 * NHV_{\text{fuel}} * m_{\text{fuel}})}{I * K_3}}$$

Where:

$(\text{rpm}_{\text{final}})_{\text{max}}$ = The maximum flywheel rotational speed allowed at the end of the test

$(\text{rpm}_{\text{final}})_{\text{min}}$ = The minimum flywheel rotational speed allowed at the end of the test

$\text{rpm}_{\text{initial}}^2$ = The squared flywheel rotational speed at the beginning of the test

NHV_{fuel} = Net heating value of consumable fuel, in Joules/kg

m_{fuel} = Total mass of fuel consumed during test, in kg

K_3 = Conversion factor, $\frac{4\pi^2}{3600 \text{ sec}^2 - \text{rpm}^2}$

I = Rated moment of inertia of the flywheel, in kg-m²

11. Calculations – Equivalent All-Electric Range for Off-Vehicle Charge Capable Hybrid Electric Vehicles.

11.1 Charge Depleting CO₂ Produced means the cumulative tailpipe CO₂ emissions produced, M_{cd} , in grams per mile during the charge depleting cycle range.

$$M_{\text{cd}} = \sum Y_i$$

where:

Y_i = The sum of the CO₂ grams per mile in the charge depleting mode from each test cycle (UDDS cycles or HFEDS cycles)

i = Number (UDDS cycles or HFEDS cycles) of the test over the charge depleting cycle range, R_{cdc}

11.2 Charge Sustaining CO₂ Produced - urban means the cumulative tailpipe CO₂ emissions produced, M_{cs} , in grams per mile, during the cold start charge sustaining urban test.

$$M_{\text{cs}} = Y_c + Y_h * \left[\frac{(R_{\text{cdcu}} - D_c)}{D_c} \right]$$

where:

R_{cdcu} = Urban Charge Depleting Cycle Range, in miles

D_c = The measured driving distance from the cold start UDDS cycle, in miles

Y_c = Grams per mile CO₂ emissions as calculated from the cold start UDDS cycle

Y_h = Grams per mile CO₂ emissions as calculated from the hot start UDDS cycle

11.3 Charge Sustaining CO₂ Produced - highway means the grams per mile tailpipe CO₂ emissions produced, M_{cs} , during the cold start charge sustaining highway test.

$$M_{cs} = \left(\frac{R_{cdch}}{D_h} \right) * Y_h$$

where:

R_{cdch} = Highway Charge Depleting Cycle Range, in miles

D_h = The measured driving distance from the hot start HFEDS cycle, in miles

Y_h = Grams per mile emissions as calculated from the hot start HFEDS cycle

11.4 Urban Equivalent All-Electric Range ($EAER_u$) shall be calculated as follows:

$$EAER_u = \left(\frac{M_{cs} - M_{cd}}{M_{cs}} \right) * R_{cdcu}$$

where:

M_{cs} is as defined in G.11.2.

M_{cd} is as defined in G.11.1, using the UDDS test cycle.

11.5 Highway Equivalent All-Electric Range ($EAER_h$) shall be calculated as follows:

$$EAER_h = \left[\frac{M_{cs} - M_{cd}}{M_{cs}} \right] * R_{cdch}$$

where:

M_{cs} is as defined in G.11.3.

M_{cd} is as defined in G.11.1, using the HFEDS test cycle.

R_{cdch} is as defined in G.11.3

11.6 Electric Range Fraction (%).

The Electric Range Fraction means fraction of the total miles driven electrically (with the engine off) for blended operation hybrid electric vehicles.

The Urban Electric Range Fraction (ERF_u) is calculated as follows:

$$ERF_u (\%) = \left(\frac{EAER_u}{R_{cda}} \right) * 100$$

The Highway Electric Range Fraction (ERF_h) is calculated as follows:

$$ERF_h (\%) = \left(\frac{EAER_h}{R_{dah}} \right) * 100$$

11.7 Equivalent All-Electric Range Energy Consumption.

The Urban Equivalent All-Electric Range Energy Consumption ($EAEREC_u$) shall be calculated as follows:

$$EAEREC_u (\text{wh/mi}) = \frac{E_{cd}}{EAER_u}$$

where:

E_{cd} = Total electrical energy used to fully charge the vehicle battery from an external power source after the charge depleting test has been completed. This shall be calculated for both AC and DC energy.

The Highway Equivalent All-Electric Range Energy Consumption ($EAEREC_h$) shall be calculated as follows:

$$EAEREC_h (\text{wh/mi}) = \frac{E_{cd}}{EAER_h}$$

where:

E_{cd} = Total electrical energy used to fully charge the vehicle battery from an external power source after the charge depleting test has been completed. This shall be calculated for both AC and DC energy.

11.8 The Urban Charge Depleting Cycle Range, R_{cdcu} , (see section H for an illustration of R_{cdcu}) shall be defined as the distance traveled on the Urban Charge Depleting Procedure up to the UDDS cycle prior to where the state-of-charge is above the lower bound state-of-charge tolerance for one test cycle given by:

$$\left(\frac{NHV_{fuel} * m_{fuel}}{\text{final min}} \right) (\text{Amp-hr})_{\text{initial}} = (\text{Amp-hr}) - 0.01 * \left(\frac{V_{system} * K_1}{\text{}} \right)$$

Where:

$(\text{Amp-hr}_{\text{final}})_{\text{min}}$ = Minimum allowed Amp-hr stored in battery at the end of the test

(Amp-hr _{initial})	=	Battery Amp-hr stored at the beginning of the test
NHV _{fuel}	=	Net heating value of consumable fuel, in Joules/kg
m _{fuel}	=	Total mass of fuel consumed during test, in kg
K ₁	=	Conversion factor, 3600 seconds/hour
V _{system}	=	Open circuit voltage (OCV) that corresponds to the SOC of the target SOC during charge sustaining operation. This value shall be submitted for testing purposes, and it shall be subject to confirmation by the Air Resources Board.

11.9 The Charge Depleting Actual Range, R_{cda} , shall be defined as the range at which the state-of-charge is first equal to the average state-of-charge of the one or two UDDS cycles used to end the Urban Charge Depleting Test. This range must be reported to the nearest 0.1 miles. For an illustration of R_{cda} see section I.

11.10 The Charge Depleting to Charge Sustaining Urban Range shall be defined as the distance driven in miles from the start of the Urban Charge Depleting Test through the UDDS cycle preceding the one or two UDDS cycles used to end the Urban Charge Depleting Test.

11.11 The Highway Charge Depleting Cycle Range, R_{cdch} , shall be defined as the sum of the distance traveled on the Highway Charge Depleting Range Test up to the HFEDS cycle prior to where the state-of-charge is above the lower bound state-of-charge tolerance for one test cycle given by:

$$(\text{Amp-hr}_{\text{final}})_{\text{min}} = (\text{Amp-hr}_{\text{initial}}) - 0.01 * \left(\frac{NHV_{\text{fuel}} * m_{\text{fuel}}}{V_{\text{system}} * K_1} \right)$$

Where:

(Amp-hr _{final}) _{min}	=	Minimum allowed Amp-hr stored in battery at the end of the test
(Amp-hr _{initial})	=	Battery Amp-hr stored at the beginning of the test
NHV _{fuel}	=	Net heating value of consumable fuel, in Joules/kg
m _{fuel}	=	Total mass of fuel consumed during test, in kg
K ₁	=	Conversion factor, 3600 seconds/hour
V _{system}	=	Open circuit voltage (OCV) that corresponds to the SOC of the target SOC during charge sustaining operation. This value shall be submitted for testing purposes, and it shall be subject to confirmation by the Air Resources Board.

11.12 The Charge Depleting to Charge Sustaining Highway Range shall be defined as the distance driven in miles from the start of the Highway Charge Depleting Range Test through the HFEDS cycle preceding the final HFEDS cycle.

11.13 The Urban Equivalent All Electric Range for vehicles with an urban charge depleting actual range greater than 40 miles, $EAER_{u40}$, is determined through the following equation:

$$EAER_{u40} \text{ (miles)} = \left(\frac{ERF_u \times 40 \text{ mi}}{100} \right)$$

12. The Calculations of the Combined Greenhouse 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.

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

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.

$$GHG_{urban} = \sum_{i=1}^{N_{urban}} (UF_i) * \left(\frac{Y_{CD,i}}{D_i} + GHG_{cd.AC,i} \right) - \sum_{i=1}^{N_{urban}} (UF_i) * G_{upstream} + \left(1 - \sum_{i=1}^{N_{urban}} (UF_i) \right) * (Y_{cs.urban}) \quad (\text{Eq. 2})$$

Where,

GHG_{urban} = Rated urban GHG emissions for PHEV, in gCO₂e/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 CO₂ in grams per vehicle mile, for the “ i ”th test in the charge depleting test

D_i = Distance of the “ i ”th urban test cycle, in miles.

$GHG_{cd.AC,i}$ = Rated GHG emissions for test cycle i , in gCO₂e/mile

$Y_{cs.urban}$ = Weighted mass emissions of CO₂ 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_j
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 gCO₂e/mile

$E_{cd.AC,i}$ = Urban or highway charge depleting electricity use, in kWh/mile

GHG_{grid} = Lifecycle California electricity GHG intensity, 270 gCO₂e/kWh

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 range 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 CO₂ 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 CO₂ in grams/mi of the charge sustaining test.

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

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

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

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

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

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

(Eq. 7)

Where,

$GHG_{highway}$ = Rated highway GHG emissions for PHEV, in gCO₂e/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 CO₂ 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 gCO₂e/mile (see Eq. 3)

$Y_{cs.highway}$ = Mass emissions of CO₂ in grams/mi of the highway charge sustaining emission test, which can be found in section F.6.3.3 of these test procedures.

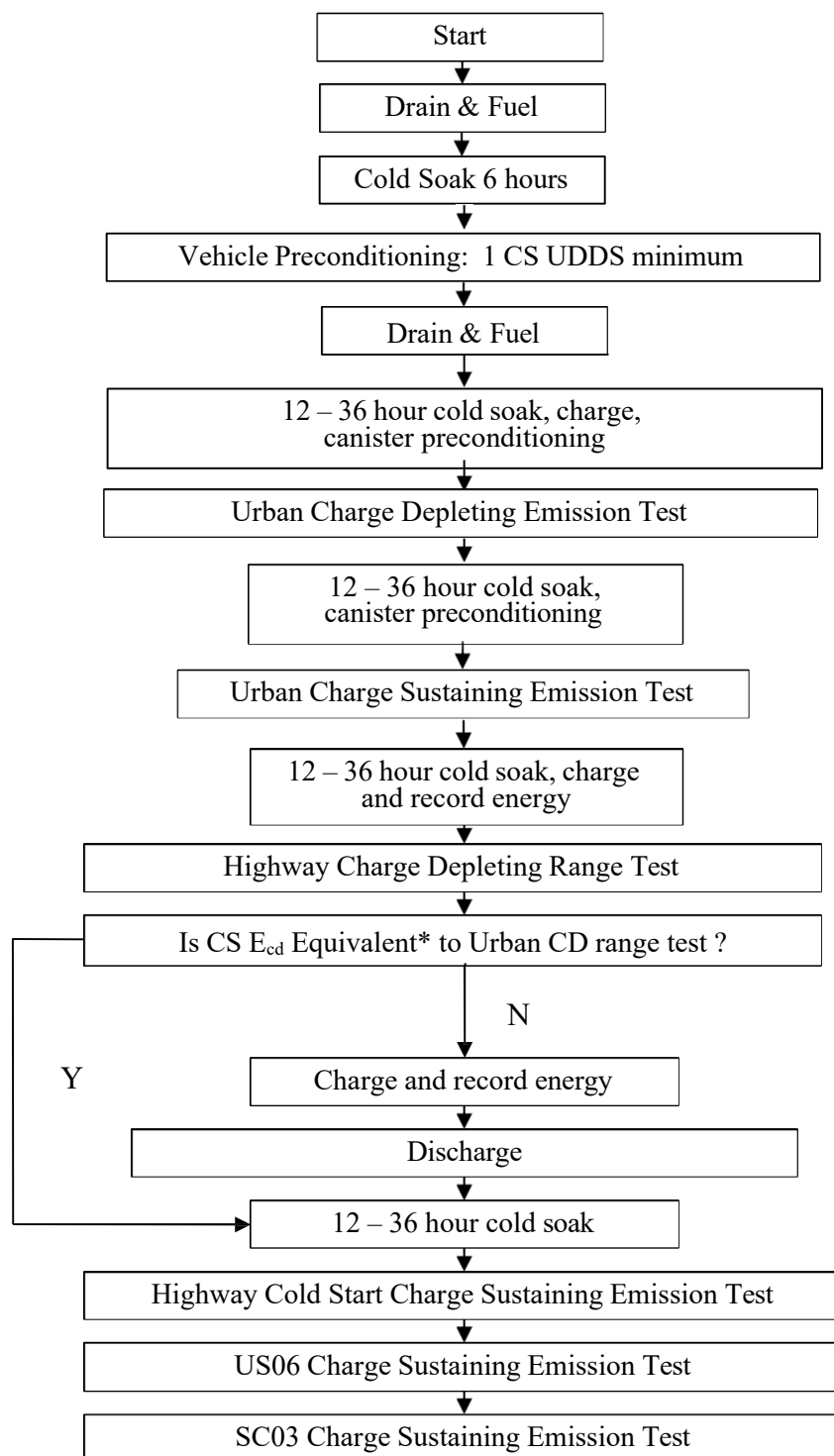
$G_{upstream}$ = Gasoline upstream factor $0.25 * GHG_{target}$

H. Off-Vehicle Charge Capable Hybrid Electric Vehicle Exhaust Emission Test Sequence.

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Off-Vehicle Charge Capable HEV Exhaust Emissions Test Sequence

* Equivalent to within $\pm 1\%$ of AC energy used to charge battery to full state of charge



I. Examples of Off-Vehicle Charge Capable Hybrid Electric Vehicle Terminology.

The figures in this section I are for illustrative purposes only. If any discrepancies exist between the language in the proceeding sections A through H and the figures in this section I, the requirements in sections A through H shall apply. The acronym “NEC” as used in this section I means “Net Energy Change.”

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**Example of an Off-Vehicle Charge Capable HEV with
AER and Blended Operation
Undergoing the Urban Charge Depleting Range Test**

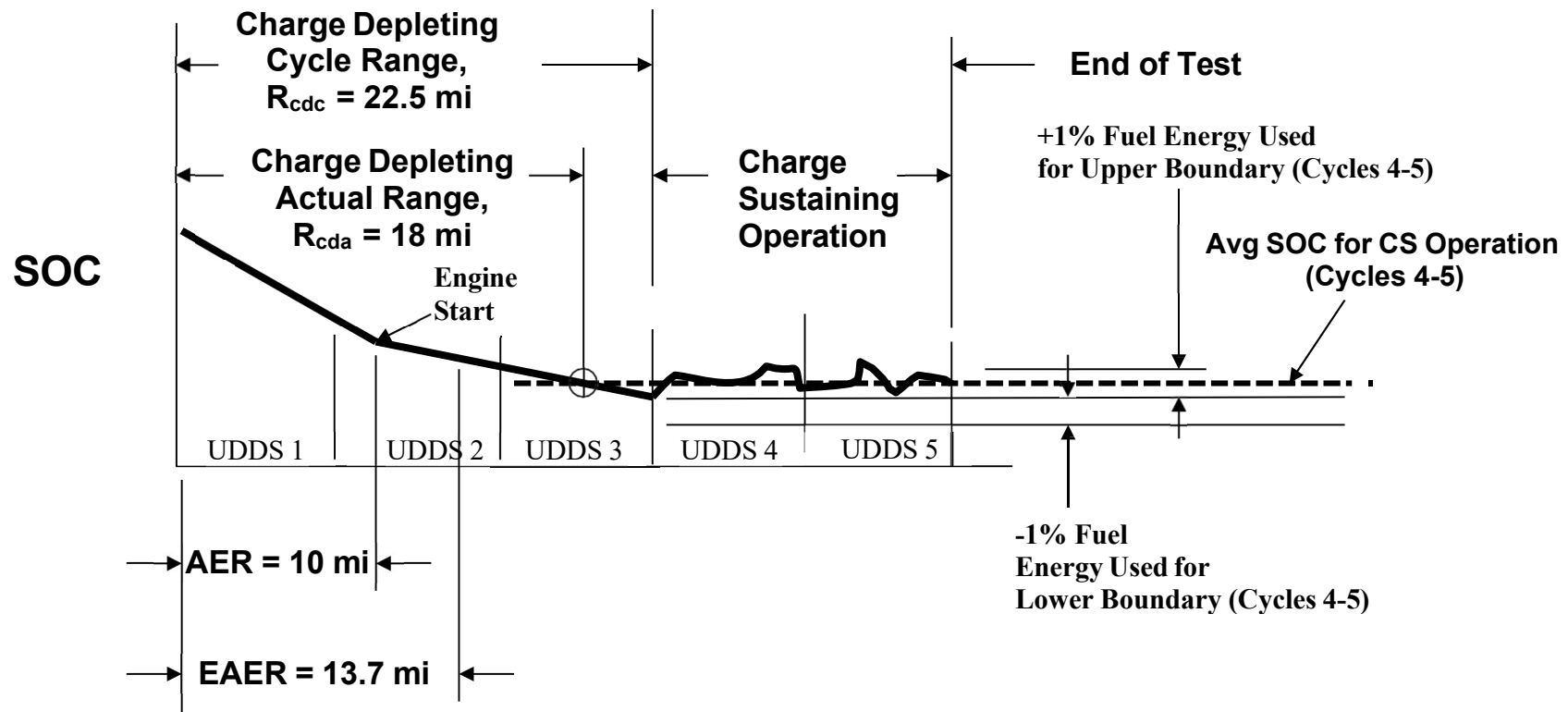
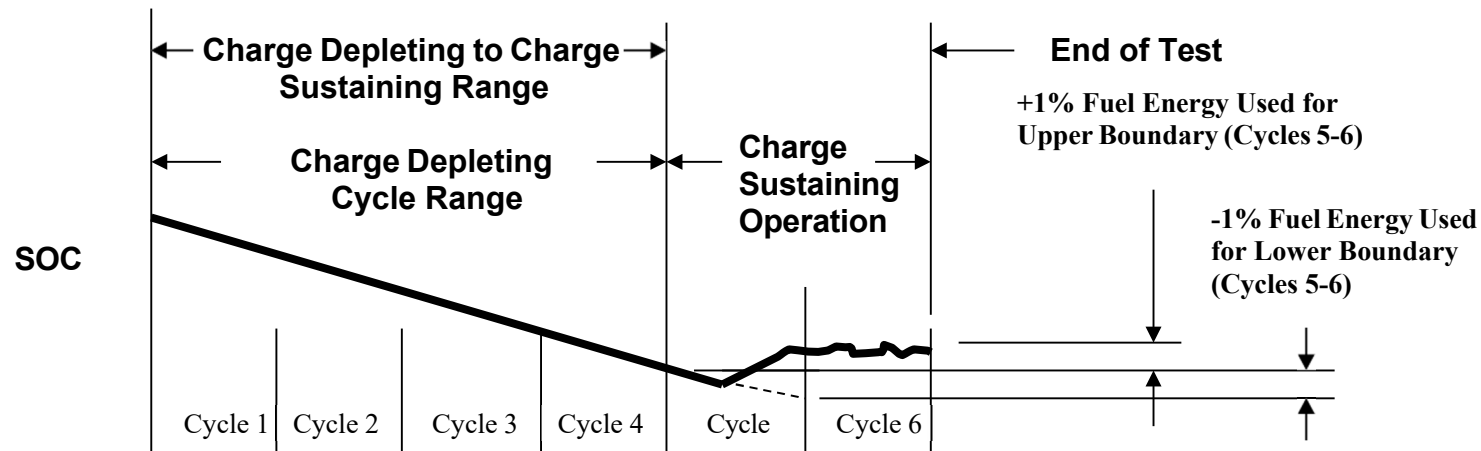


Figure 1

Example of Urban End of Test Conditions for Off-Vehicle Charge Capable HEV



Example of Urban End of Test Conditions for Off-Vehicle Charge Capable HEV with Transitional Range

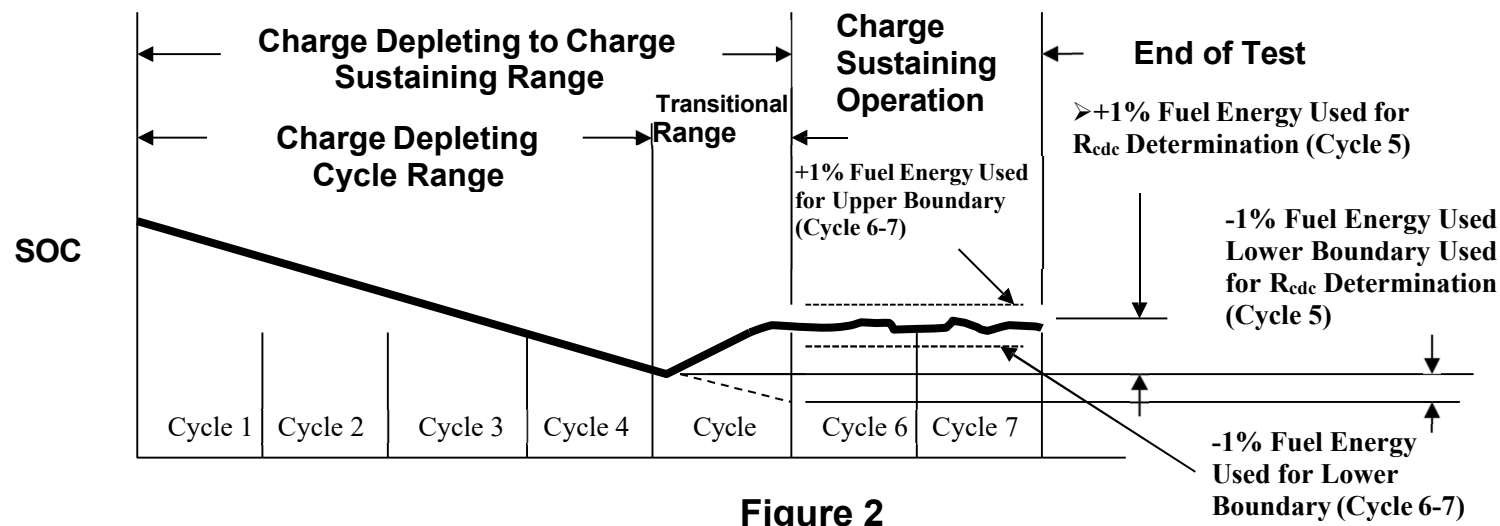
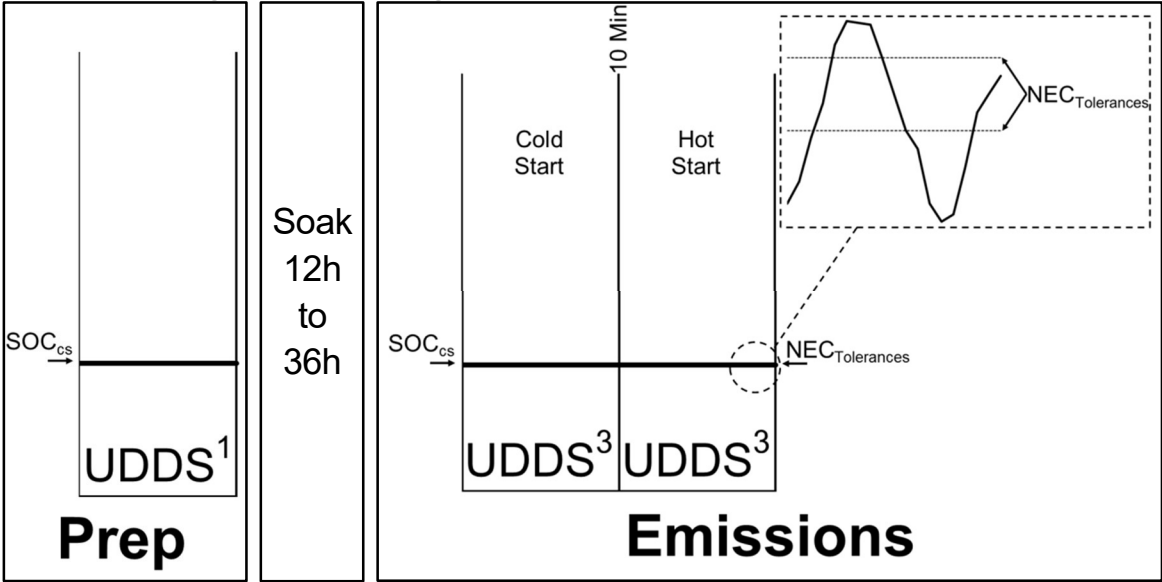
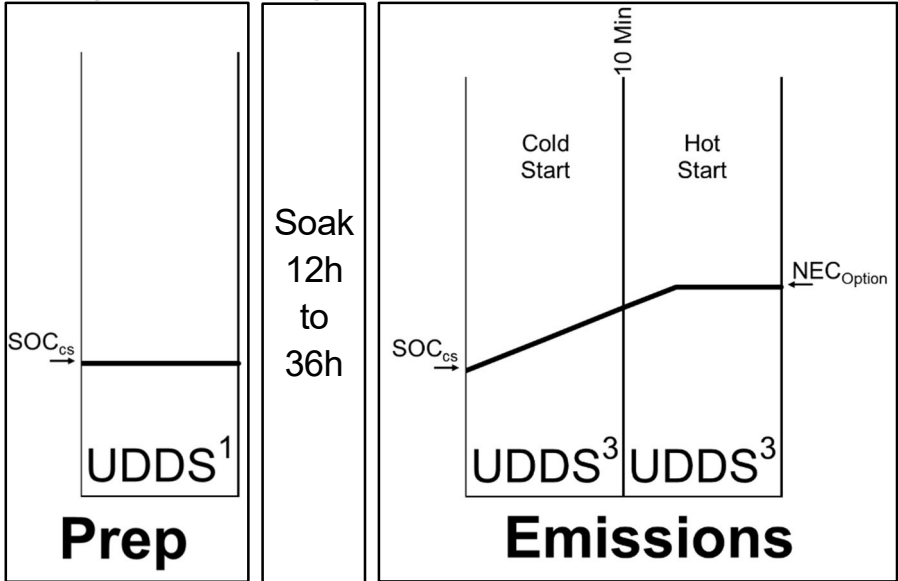


Figure 2

Urban Charge-Sustaining Emission Test



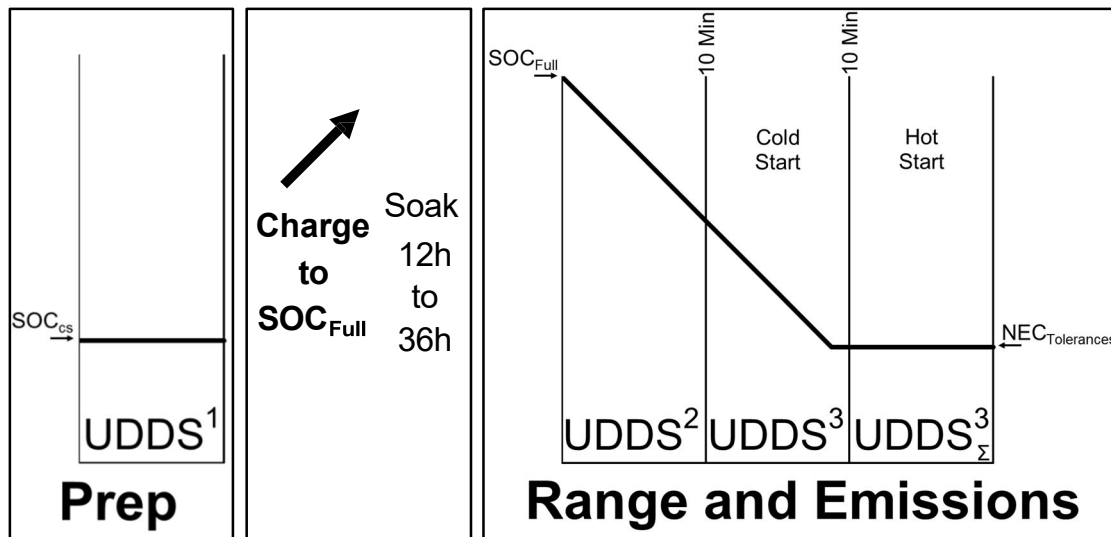
Urban Charge-Sustaining Emission Test with Charge-Increasing Driver-Selectable Mode Activated



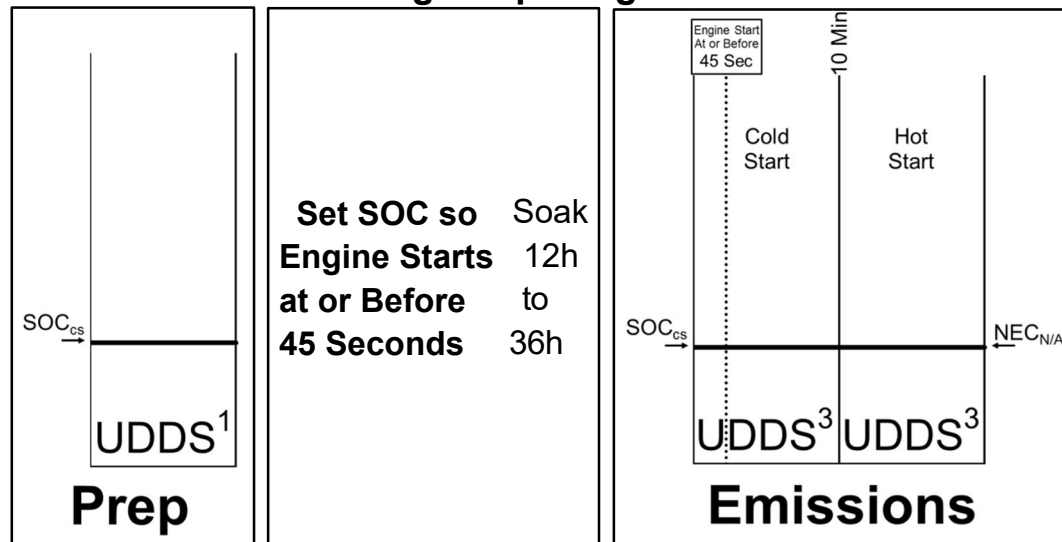
¹ Emission sampling not required
² Emission sampling optional
³ Emission sampling required
 SOC_{cs} : State-of-Charge at charge-sustaining level
 $NEC_{Tolerances}$: Net Energy Change Tolerances required
 NEC_{Option} : NEC Tolerances apply; however, option available to validate test when SOC final > SOC initial.

Figure 3

Urban Charge-Depleting Emission Test with Urban AER and EAER



Alternative Urban Charge-Depleting Emission Test



¹ Emission sampling not required

² Emission sampling optional

³ Emission sampling required

$UDDS_s$: Multiple Hot Start $UDDS$ cycles may be required to satisfy NEC Tolerances

SOC_{cs} : State-of-Charge at charge-sustaining level

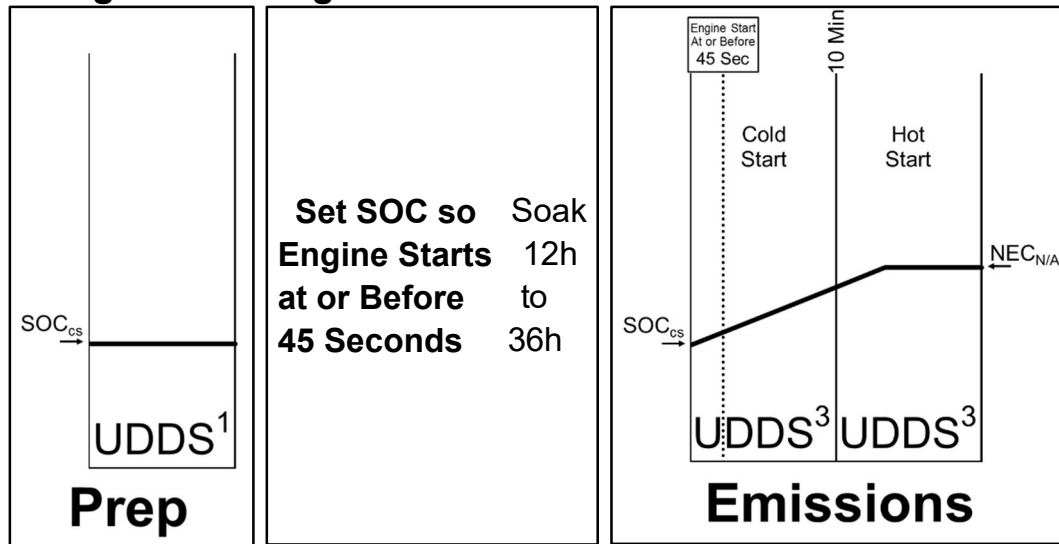
SOC_{Full} : State-of-Charge at full charge

$NEC_{Tolerances}$: Net Energy Change Tolerances required

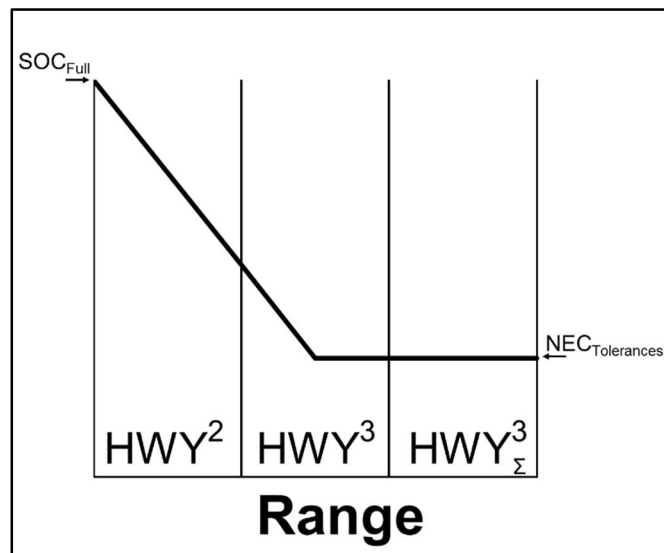
$NEC_{N/A}$: Net Energy Change Tolerances not applicable

Figure 4

Alternative Urban Emission Test with Charge-Increasing Driver-Selectable Mode Activated



HWY AER and EAER Test



¹ Emission sampling not required

² Emission sampling optional

³ Emission sampling required

HWYs: Multiple HFEDS cycles may be required to satisfy NEC Tolerances

SOC_{cs}: State-of-Charge at charge-sustaining level

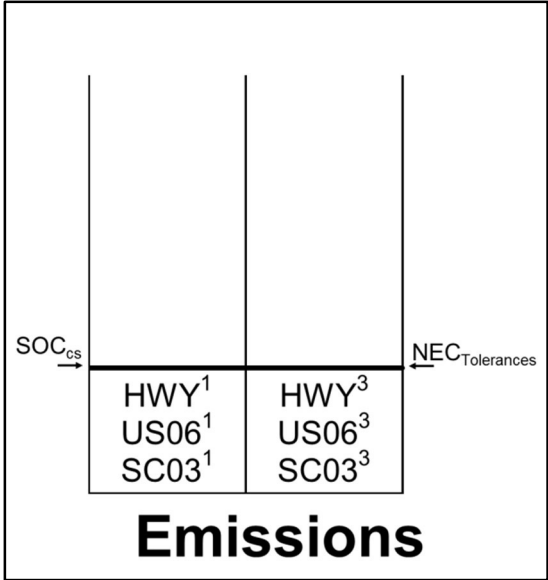
SOC_{Full}: State-of-Charge at full charge

NEC_{Tolerances}: Net Energy Change Tolerances required

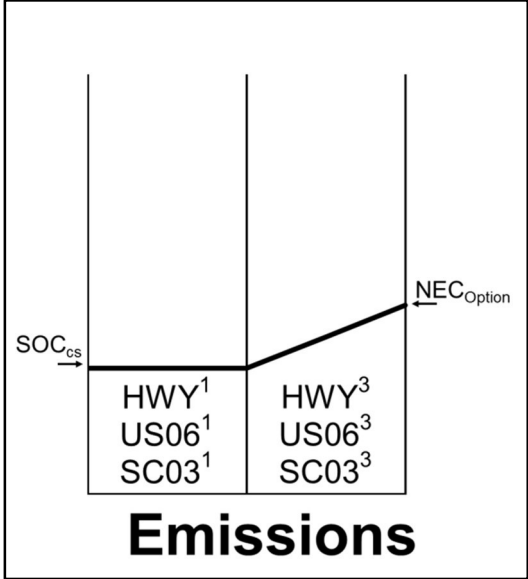
NEC_{N/A}: Net Energy Change Tolerances not applicable

Figure 5

HWY and SFTP Emission Test



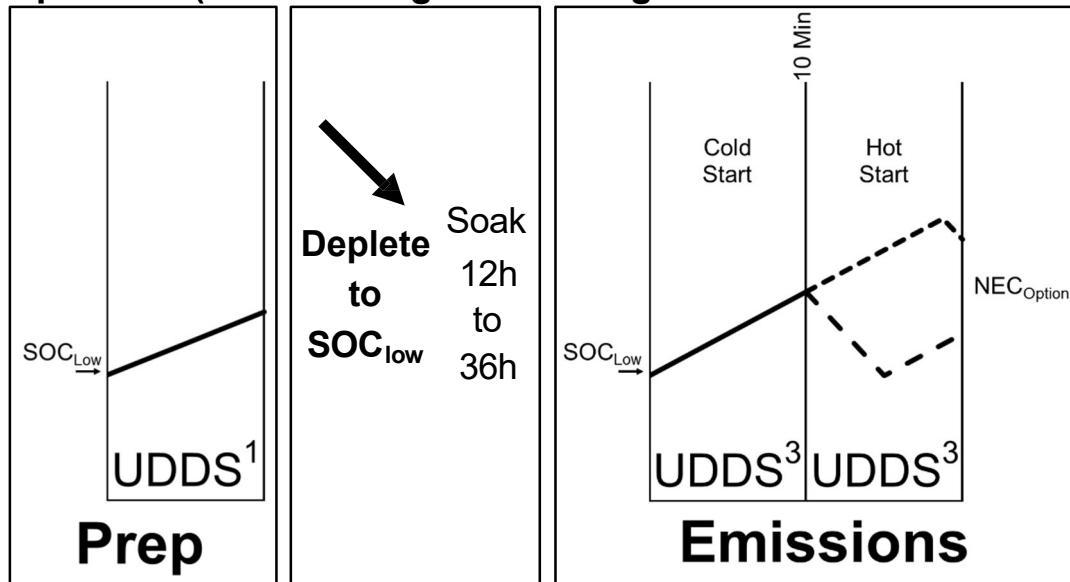
HWY and SFTP Emission Test with Charge-Increasing Driver-Selectable Mode Activated



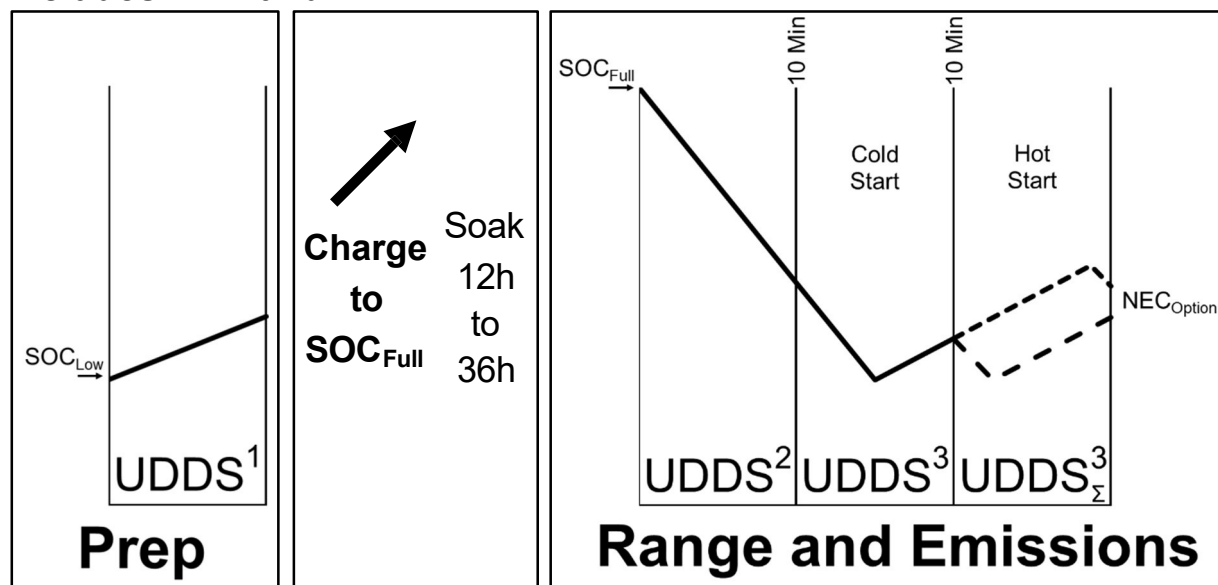
¹ Emission sampling not required
² Emission sampling optional
³ Emission sampling required
SOC_{cs}: State-of-Charge at charge-sustaining level
NEC_{Tolerances}: Net Energy Change Tolerances required
NEC_{Option}: NEC Tolerances apply; however, option available to validate test when SOC final > SOC initial.

Figure 6

Urban Charge-Sustaining Emission Test with Charge-Increasing Operation (not for charge-increasing driver-selectable mode testing)



Urban Charge-Depleting Emission Test with Charge-Increasing Operation (not for charge-increasing driver-selectable mode testing) Includes AER and EAER.



¹ Emission sampling not required

² Emission sampling optional

³ Emission sampling required

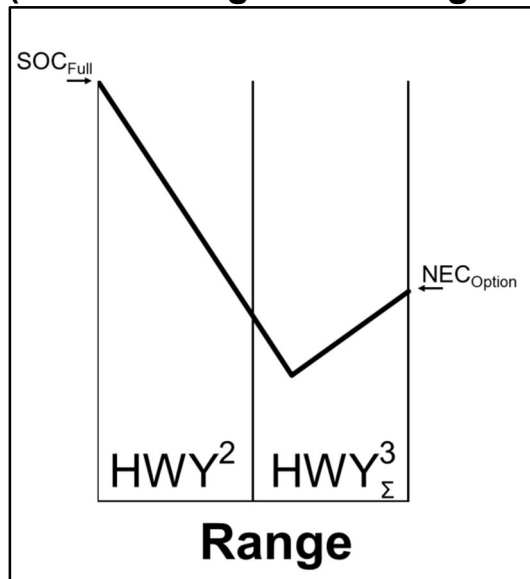
UDDS: Multiple Hot Start UDDS cycles may be required to satisfy NEC Tolerances

SOC_{Low} : Initial State-of-Charge set at lowest normal SOC allowed by vehicle when driving on UDDS

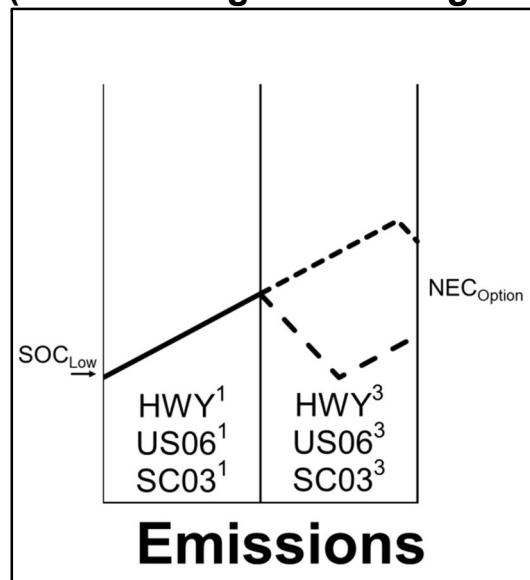
NEC_{Option} : NEC Tolerances apply; however, option available to validate test when $SOC_{final} > SOC_{initial}$.

Figure 7

HWY AER and EAER Test with Charge-Increasing Operation (not for charge-increasing driver-selectable mode testing)



HWY and SFTP Emission Test with Charge-Increasing Operation (not for charge-increasing driver-selectable mode testing)



¹ Emission sampling not required

² Emission sampling optional

³ Emission sampling required

HWYs: Multiple HFEDS cycles may be required to satisfy NEC Tolerances

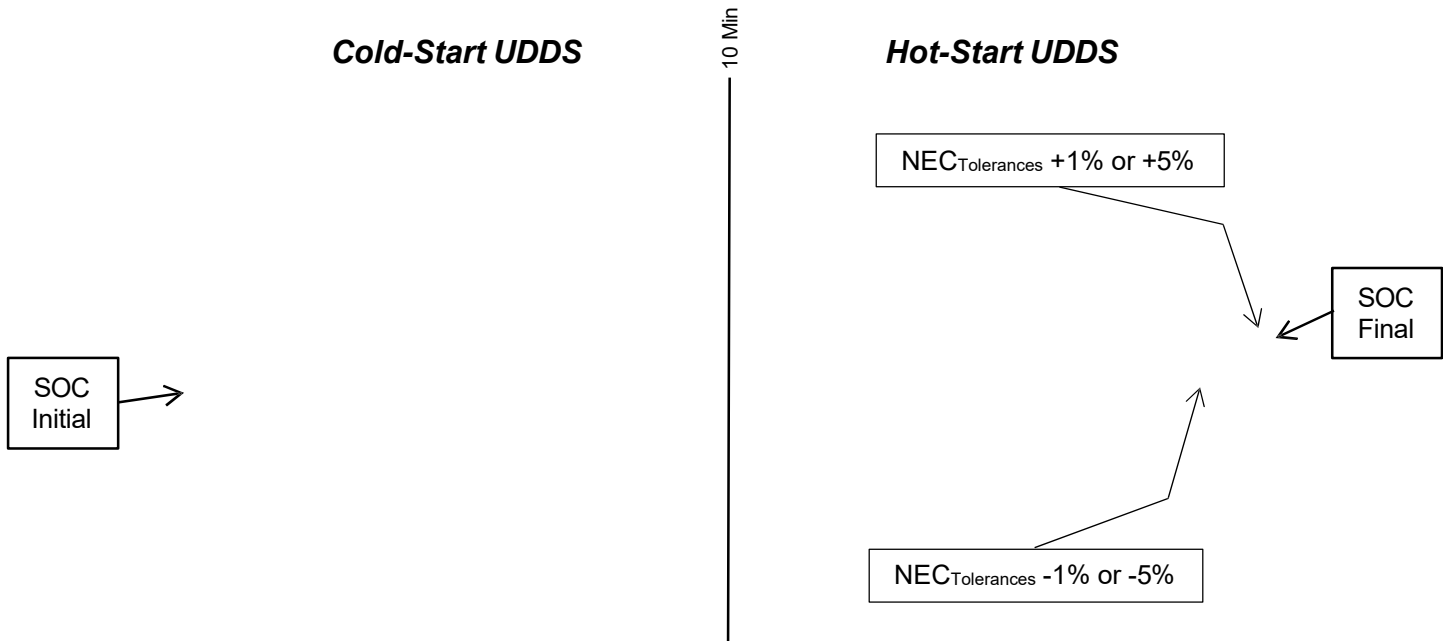
SOC_{Full} : State-of-Charge at full charge

SOC_{Low} : Initial State-of-Charge set at lowest normal SOC allowed by vehicle when driving on UDDS

NEC_{Option} : NEC Tolerances apply; however, option available to validate test when SOC final > SOC initial.

Figure 8

Urban Charge-Sustaining Emission Test – Valid Test



Highway and SFTP Emission Tests – Valid Test

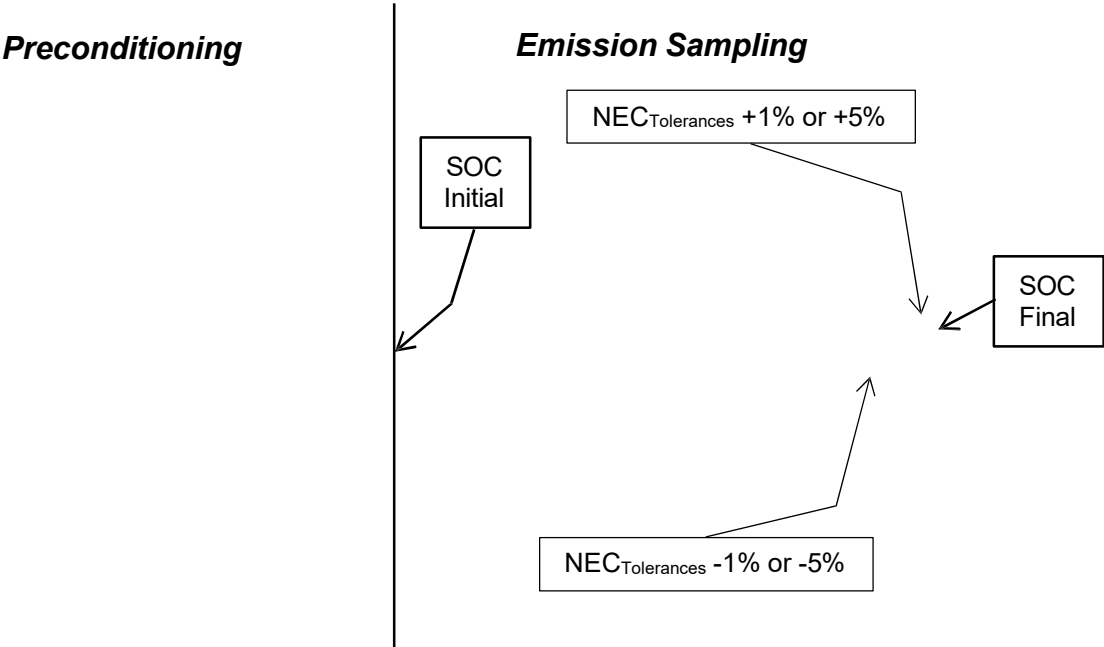


Figure 9

J. Advanced Technology Demonstration Program data requirements.

A vehicle placed in a California advanced technology demonstration program may earn ZEV credits even if it is not “delivered for sale” in accordance with the ZEV regulation section C.7.4. Approval by the ARB’s Executive Officer is required for Advanced Technology Demonstration Program credits. The following data shall be provided in order to evaluate applications for an Executive Order:

1. Project Description

- (a) General description
- (b) Goal
- (c) Specific objectives (e.g. durability tests, customer marketability)
- (d) Location (include state, city, and agency/organization)

2. Vehicle data

- (a) Model
- (b) Model year
- (c) Date placed in program
- (d) Vehicle Identification Number (VIN)

3. Vehicle specifications

- (a) Passenger car (PC) or light duty truck (LDT)
- (b) Curb weight – pounds (lbs)
- (c) Payload (lbs)
- (d) City/highway range – miles (mi)
- (e) Estimated fuel economy or EPA fuel economy city/highway – miles per gallon (mpg)
- (f) Fuel type
- (g) Refueling time
- (h) Electric motor output – kilowatts (kW)
- (i) Hybrid energy storage; type, capacity and peak power
- (j) For Battery Electric Vehicles and hybrids – fuel fired heater (yes/no)
- (k) For Fuel Cell Vehicles (FCVs), fuel cell stack: type, peak output, manufacturer and estimated design life.