State of California
AIR RESOURCES BOARD

FINAL STATEMENT OF REASONS

AMENDMENTS TO THE LEV III CRITERIA POLLUTANT REQUIREMENTS FOR LIGHT- AND MEDIUM-DUTY VEHICLES, THE HYBRID ELECTRIC VEHICLE TEST PROCEDURES, AND THE HEAVY-DUTY OTTO-CYCLE AND HEAVY-DUTY DIESEL TEST PROCEDURES

August 2015

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State of California
AIR RESOURCES BOARD

**Final Statement of Reasons for Rulemaking,
Including Summary of Comments and Agency Response**

PUBLIC HEARING TO CONSIDER THE PROPOSED AMENDMENTS TO THE LEV III CRITERIA POLLUTANT REQUIREMENTS FOR LIGHT- AND MEDIUM-DUTY VEHICLES, THE HYBRID ELECTRIC VEHICLE TEST PROCEDURES, AND THE HEAVY-DUTY OTTO-CYCLE AND HEAVY-DUTY DIESEL TEST PROCEDURES

Public Hearing Date: October 23, 2014
Agenda Item No.: 14-8-1

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I. GENERAL

A. The Staff Report: Initial Statement of Reasons for Rulemaking (staff report), entitled "Proposed Amendments to the LEV III Criteria Pollutant Requirements for Light- and Medium-Duty Vehicles, the Hybrid Electric Vehicle Test Procedures, and the Heavy-Duty Otto-Cycle and Heavy-Duty Diesel Test Procedures," released September 2, 2014, is incorporated by reference herein. The staff report, which is incorporated by reference herein, contained a description of the rationale for the proposed amendments. On September 2, 2014, all references relied upon and identified in the staff report were made available to the public.

On October 23, 2014, Air Resources Board (ARB or Board) conducted a public hearing to consider the proposed amendments to the LEV III criteria pollutant requirements for light- and medium-duty vehicles, the Hybrid Electric Vehicle Test Procedures, and the Heavy-Duty Otto-Cycle and Heavy-Duty Diesel Test Procedures. At this hearing, the Board received oral and additional written comments. At the conclusion of the hearing, the Board approved Resolution 14-34, in which it directed the Executive Officer to make the originally proposed amendments to the regulations and test procedures with a number of proposed modifications available for formal public comment.

These modifications include revisions to the sections of the regulations and test procedures that reference the Code of Federal Regulations (CFR) to reference the date that revisions to these sections that were published in the Federal Register after the release of the Staff Report. They also include a number of modifications to the original proposal, in response to public comments made after issuance of the original proposal and to correct errors in the original proposal. The proposed modified regulatory and test procedure language was contained in a 30-page document entitled, "Staff's Suggested Changes to the Original Proposal," which was distributed at the beginning of the hearing and included as Attachment K to Resolution 14-34.

Resolution 14-34 directed the Executive Officer to incorporate the modifications described in Attachment K into the originally proposed regulatory text, with such other conforming modifications as may be appropriate. The Executive Officer was directed to make the modified regulation (with the modifications clearly identified) and any additional documents or information available for a supplemental public comment period. He was also directed to consider any comments on the modifications received during the supplemental comment period. The Executive Officer was then directed to (1) adopt the modified regulation as it was made available for public comment, with any appropriate conforming additional modifications; (2) make all modifications available for public comment for an additional period of at least 15 days; and (3) present the regulation to the Board for further consideration if he determined that this is warranted.

In preparing the modified regulatory language, the staff proposed additional conforming revisions in response to public comments received during the 45-day comment period. These post-hearing modifications were incorporated into the text of the proposed regulation, along with the modifications specifically identified in Attachment K to Resolution 14-34.

The text of the proposed modifications to the regulation, with the modified text clearly indicated, was made available for a first 15-day comment period starting on December 23, 2014 and ending on January 12, 2015 at 5:00 p.m., by issuance of a Notice of Public Availability of Modified Text and Availability of Additional Documents, which included two enclosures: Enclosure A – "Proposed Modified Text of the Proposed Amendments to the LEV III Criteria Pollutant Requirements for Light- and Medium-Duty Vehicles, the Hybrid Electric Vehicle Test Procedures, and the Heavy-Duty Otto-Cycle and Heavy-Duty Diesel Test Procedures" and Enclosure B – "Summary of 15-Day Changes to Proposed Regulation Order and Incorporated Test Procedures."

In light of the supplemental comments received, the Executive Officer determined that additional modifications were necessary. A Second Notice of Public Availability of Modified Text (the "second 15-day notice") identifying the additional substantive modifications was made available for a second 15-day comment period starting on June 9, 2015 and ending on June 24, 2015 at 5:00 p.m., by issuance of a Second Notice of Public Availability of Modified Text and Availability of Additional Documents, which included two enclosures: Enclosure A – "Proposed Second 15-day Modifications to the Proposed Amendments to the LEV III Criteria Pollutant Requirements for Light- and Medium-Duty Vehicles, the Hybrid Electric Vehicle Test Procedures, and the Heavy-Duty Otto-Cycle and Heavy-Duty Diesel Test Procedures" and Enclosure B – "Summary of Second 15-Day Changes to Proposed Regulation Order and Incorporated Test Procedures." Comments from two parties were submitted during the second supplemental comment period.

Subsequent to the close of the comment period for the second 15-day notice, the Executive Officer determined that a Third Notice of Public Availability of Modified Text (the "third 15-day notice") was needed. The third 15-day notice was made available for a third 15-day comment period starting on August 6, 2015 and ending on August 21, 2015 at 5:00 p.m., by issuance of a Third Notice of Public Availability of Modified Text and Availability of Additional Documents, which included one enclosure: Enclosure A – "Proposed Third 15-day Modifications to the Proposed Amendments to the LEV III Criteria Pollutant Requirements for Light- and Medium-Duty Vehicles, the Hybrid Electric Vehicle Test Procedures, and the Heavy-Duty Otto-Cycle and Heavy-Duty Diesel Test Procedures." No comments were submitted during the third supplemental comment period.

B. MANDATES AND FISCAL IMPACTS TO LOCAL GOVERNMENTS AND SCHOOL DISTRICTS

The Board has determined that this regulatory action will not result in a mandate to any local agency or school district the costs of which are reimbursable by the state pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code.

C. CONSIDERATION OF ALTERNATIVES

For the reasons set forth in the Staff Report, in staff's comments and responses at the hearing, and in this Final Statement of Reasons (FSOR), the Board determined that no alternative considered by the agency would be more effective in carrying out the purpose for which the regulatory action was proposed, or would be as effective as and less burdensome to affected private persons, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law than the action taken by the Board.

II. MODIFICATIONS MADE TO THE ORIGINAL PROPOSAL

A. MODIFICATIONS PROVIDED FOR IN THE FIRST 15-DAY COMMENT PERIOD

First 15-day modifications to original proposal that were not made in response to public comment and, therefore, are not separately discussed in the summary of comments and agency response include the following. These do not include modifications that were strictly editorial in nature.

1. Correction to California Code of Regulations (CCR) §1961.2(a)(8)(C)2 and the corresponding section 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" (LDTPs): This subsection has been revised to allow interim in-use supplemental federal test procedure (SFTP) particulate matter (PM) emission standards for all light-duty and medium-duty passenger vehicles certifying to these standards through the 2023 model year. The purpose of this change is to provide interim relief during the phase-in of the SFTP PM Certification standards.

2. Correction to the footnote in the table in CCR §1961.2(b)(3)(A) and the corresponding section in the LDTPs, which stated in the 45-day notice language that the LEV II standards apply through the 2021 model year. It is necessary to correct this footnote, because the statement conflicts with CCR §1961, which sunsets the LEV II standards after the 2019 model year. It is, therefore, necessary to correct the footnote to align with CCR §1961.

3. Addition of language into LDTP section D.2.3 that specifies that SFTP standards shall only apply at low altitude conditions. This language was inadvertently eliminated from the LEV III program when it was moved from a section of the CFR that is incorporated into the LDTPs into a section of the CFR that is not incorporated into the LDTPs.

4. Addition of LDTP section J.1.1 to correct an error in a section of the CFR that is referenced.

5. Changes to the dates of applicability for several of the CFR sections that are incorporated into various California test procedures to update the incorporated sections to the most current versions. These changes are needed to allow harmonization with federal regulations.

6. Language was added 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" (HEV TPs) specifying that all-electric range testing shall be performed with the vehicle in default mode or normal mode if the vehicle does not have a default mode as part of the first and second 15-day changes.

7. The phrase "of the engine" was deleted in the HEV TPs with regard to vehicle operation, driver-selectable modes, and emissions since these characteristics are not limited to the engine alone. This modification was done as part of the first 15-day changes, but also as part of the second 15-day changes because some of the "of the engine" phrases were overlooked when modifications were made for the first 15-day changes.

8. The phrase "if shown to be equivalent" in reference to alternative procedures was reinserted in the HEV TPs as part of first 15-day changes after inadvertently being deleted as a 45-day change. In addition, this phrase was added as part of first and second 15-day modifications to several sections where it was missing.

9. Language clarifying worst case testing was added, deleted, or modified in section F of the HEV TPs regarding each emission test as described in the introductory paragraphs. Specifically, guidance was provided in terms of what would be considered worst case regarding vehicles with one or more driver-selectable modes and that compliance would be based on worst case emission testing. These modifications were part of the first and second 15-day changes.

10. The phrase "except as noted" was added to the introductory paragraph of section F.8 of the HEV TPs since it was inadvertently not added during the 45-change. This modification was done as part of the first 15-day change, and a correction to a typo "a" was changed to "as" during the second 15-day change.

11. Language was added, deleted, or modified to clarify the Urban Emission Test in sections F.6.1, F.6.2, and F.6.3 of the HEV TPs. Specifically, guidance was provided in terms of the overall sequence and how to perform vehicle preconditioning, test driver-selectable modes, and validate a test through end-of-test conditions. The test cycle to be used was identified as the UDDS. These modifications were part of the first and second 15-day changes.

12. Language was added, deleted, or modified to clarify the Highway Emission Test in section F.7.1 of the HEV TPs. Specifically, guidance was provided in terms of the how to perform vehicle preconditioning, how to test driver-selectable modes, and how to validate a test through end-of-test conditions. These modifications were part of the first and second 15-day changes.

13. Language was added, deleted, or modified to clarify the US06 Emission Test in section F.8.1 of the HEV TPs. Specifically, guidance was provided in terms of the how to perform vehicle preconditioning, how to test driver-selectable modes, and how to validate a test through end-of-test conditions. These modifications were part of the first and second 15-day changes.

14. Language was added, deleted, or modified to clarify the SC03 Emission Test in section F.8.2 of the HEV TPs. Specifically, guidance was provided in terms of the how to perform vehicle preconditioning, how to test driver-selectable modes, and how to validate a test through end-of-test conditions. These modifications were part of the first and second 15-day changes.

15. The title of section G.7.3 of the HEV TPs was modified to include the description of “All-Electric” so that the title reads, “Optional Cold Start US06 All-Electric Range Test.” This modification was part of the first 15-day changes.

B. MODIFICATIONS PROVIDED FOR IN THE SECOND 15-DAY COMMENT PERIOD

Second 15-day modifications to the original proposal that were not made in response to public comment and, therefore, are not separately discussed in the summary of comments and agency response are the following. These do not include modifications that were strictly editorial in nature.

1. Corrections to CCR §1961.2: Subsections (a)(7)(B) (footnote 1 to Table), (a)(7)(C) (footnote 6 to Table), and (b)(4)(B) were modified to fix incorrect references.

2. Correction to Part II. Subpart H §1065.710, Subsection (b)(2) of the “California Exhaust Emission Standards and Test Procedures for

2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles": In response to a comment submitted during the 45-day period (Comment 33), the LDTPs were modified as part of the first 15-day changes to expand the allowable ethanol limit for E10 certification gasoline. This change should also have been made to the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles" as part of the first 15-day changes. However, this was not done. Consequently, it was necessary to modify the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles" as part of the second 15-day changes to correct this oversight.

3. On February 19, 2015, the United States Environmental Protection Agency published a Direct Final Rule[1] in the Federal Register that contains non-substantive corrections to a number of sections of the CFR that are incorporated into the LDTPs, the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles," and the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles." These documents were modified to incorporate the February 19, 2015 versions of these CFR sections as part of the second 15-day changes. These changes are needed to allow harmonization with federal regulations.

4. A definition for "Default Mode" was added to the HEV TPs as a 45-day change. A second definition for "Default Mode" was added as a first 15-day change. It was necessary to delete the definition that was part of the 45-day changes, since it is no longer needed.

5. The definition for "Grid-connected hybrid electric vehicle" in the HEV TPs was modified to include plug-in hybrid electric vehicle or PHEV as part of the second 15-day changes.

6. Addition of a requirement in section D.2.15(d) in the HEV TPs to report the end-of-test option used for the Urban Charge-Sustaining Emission Test for certification.

7. Correction to section F.6 introductory paragraph in the HEV TPs where the Urban Emission Test, Highway Emission Test, US06 Emission Test, SC03 Emission Test were inadvertently added as a 45-

[1] Federal Register, Volume 80, No. 33 / Thursday, February 19, 2015 / Direct Final Rule, Environmental Protection Agency, "Amendments Related to: Tier 3 Motor Vehicle Emission and Fuel Standards, Nonroad Engine and Equipment Programs, and MARPOL Annex VI Implementation." http://www.gpo.gov/fdsys/pkg/FR-2015-02-19/pdf/2015-02846.pdf

day change. These tests were deleted as part of second 15-day modifications.

C. MODIFICATIONS PROVIDED FOR IN THE THIRD 15-DAY COMMENT PERIOD

1. References to five documents that were erroneously identified as references within the proposed new "California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent Model Year Vehicles" were deleted. These references were deleted, because upon closer examination, it was determined that such documents did not constitute technical, theoretical, or empirical studies, reports or similar documents that the Board relied upon in approving for adoption the proposed amendments.

D. NON-SUBSTANTIAL MODIFICATIONS

Subsequent to the third 15-day public comment period mentioned above, staff identified the following additional non-substantive changes to the regulation:

1. Comment 153, submitted during the second 15-day notice comment period, identified a typographical error in the language that was added to Part II, A, section 100.3.4.3 of the LDTPs as part of the 45-day notice. This error incorrectly identified "40 CFR §1065.710(b)" as "40 CFR §1065.710 15(b)." ("40 CFR §1065.710 15(b)" does not exist.) This typographical error has been corrected. The revised text is now show as "40 CFR §1065.710(b)."

2. There are two additional typographical error in the language that was added to Part II, A, section 100.3.4.3 of the LDTPs as part of the 45-day notice. Two hyphens were inadvertently omitted from "40 CFR §§86.107-96 through 86.143-96." Instead, the sections were incorrectly shown as "40 CFR §§86.107 96 through 86.143 96." However, these two sections ("40 CFR §86.107 96" and "40 CFR §86.143 96") do not exist in the CFR without the hyphens. These typographical errors have been corrected. The revised text is now show as "40 CFR §§86.107-96 through 86.143-96."

3. Comment 160, submitted during the second 15-day notice comment period, identified a typographical error in the language that was added to section F.8.2.5 of the HEV TPs. The original language incorrectly stated: "A valid test shall satisfy the SOC Net Energy Change Tolerances in section G.10 for the SC03 cycle with emission sampling." However, the sentence should say: A valid test shall satisfy the SOC Net Energy Change Tolerances in section F.9 for the SC03 cycle with emission sampling." This typographical error has been corrected.

4. There is a typographical error in the definition of **"Charge depleting actual range, urban"** in section B of the HEV TPs. The added word "cycle" should be "cycles," since the definition refers to

"two consecutive UDDS cycles." This typographical error has been corrected.

5. There is a typographical error in the language that was added to section G.7.1.3 of the HEV TPs. The word "subparagraph" was misspelled as "ubparagraph." This typographical error has been corrected.

The above described modifications constitute non-substantial changes to the regulatory text because they more accurately reflect the numbering of a section and correct spelling and grammatical errors, but do not materially alter the requirements or conditions of the proposed rulemaking action.

III. DOCUMENTS INCORPORATED BY REFERENCE

The regulations and the incorporated test procedures adopted by the Executive Officer incorporate by reference the following documents. Only those documents that are newly incorporated by this rulemaking are noted below.

The following documents are incorporated by reference 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":

- SAE International, 2012. J1634: "Battery Electric Vehicle Energy Consumption and Range Test Procedure," as revised by SAE International in October, 2012. Copyrighted.

- SAE International, 2010. J1711: "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 June, 2010. Copyrighted.

These documents were incorporated by reference because it would be cumbersome, unduly expensive, and otherwise impractical to publish them in the California Code of Regulations (CCR). In addition, some of the documents are copyrighted, and cannot be reprinted or distributed without violating the licensing agreements. The documents are lengthy and highly technical test methods and engineering documents that would add unnecessary additional volume to the regulation. Distribution to all recipients of the CCR is not needed because the interested audience for these documents is limited to the technical staff at a portion of reporting facilities, most of whom are already familiar with these methods and documents. Also, the incorporated documents were made available by ARB upon request during the rulemaking action and will continue to be available in the future. The documents are also available from college and public libraries, or may be purchased directly from the publishers.

IV. SUMMARY OF COMMENTS AND AGENCY RESPONSE

The Board received six sets of written comments and six oral comments in connection with the October 23, 2014 hearing, two written comments during the first 15-day comment period, two written comments during the second 15-day comment period, and no written comments during the third 15-day comment period. Set forth below are either the full text or a summary of each objection or recommendation specifically directed at the proposed regulation or to the procedures followed by ARB in proposing or adopting the regulation, together with an agency response. The comments have been grouped by topic whenever possible.

A. COMMENTS PRESENTED PRIOR TO OR AT THE HEARING

1. General Comments

1. Comment: There are multiple roll-out provisions in several appendices, parts, and subparts. Even with the suggested changes below, there may still be some unintended early rollouts of the Part 1065 / 1066 requirements. To avoid these situations, ARB may want to consider some higher level guidance reinforcing these rollout provision's to insure harmonization with Tier 3. Tier 3 did something similar in Part 86.1801-12 (a) and Part 600.111-08's introduction. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

   Agency Response: Staff believes that the roll-out provisions of the CFR Part 1065 and 1066 sections have been adequately addressed. It is unclear what the commenter means by "unintended early rollouts." However, staff does not believe it is appropriate to incorporate language that is broad enough to address generic "unintended early rollouts," without understanding the potential impacts such broad language may have on the LEV III program.

2. Comment: Additionally, and most importantly, LEV III and Tier 3 test procedures will continue to evolve over time due to the technical complexity of vehicles and this LEV III & Tier 3 emissions testing. Unintended errors and omissions will occur which will need to be quickly resolved. For example, future CFR changes would create new revision dates for some of the Tier 3 citations in the LEV III rule. To address this evolution of test procedures, we highly recommend ARB provide some mechanism to quickly resolve issues then implement solutions. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

   Agency Response: Changes to California's motor vehicle regulations and test procedures must be done through ARB's board hearing process, as governed by the California Administrative Procedures Act.

2. Comments Concerning the LEV III Exhaust Emissions Regulations

General Comments

3. Comment: We identified a number of improvements and/or technical corrections to the proposed regulations soon after the ISOR was published on 2-Sep-2014 and met with ARB staff to review these changes. We have included these changes as Attachments 1 (general regulatory recommendations) and 2 (detailed test procedure recommendations) to this document. We recommend the Board authorize the ARB staff to make the changes identified in Attachments 1 and 2. We recommend incorporating test procedure changes that have the agreement of industry and ARB staff into a regulatory package for the board's review and approval as soon as possible, but no later than the next light-duty vehicle regulatory change (likely the On-Board Diagnostic rulemaking in early 2015). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

   Agency Response: Staff will respond to the comments in Attachments 1 and 2 as individual comments. Staff has not seen any comments that necessitate the urgency of another LEV III rulemaking "as soon as possible." However, staff will evaluate the necessity of making additional regulatory changes to LEV III and the appropriateness of the timing of potential changes as additional information becomes available.

Comments Concerning the In-Use Verification (IUVP) Program

4. Comment: EPA and ARB both have in-use verification program (IUVP) requirements. Under the IUVP program, manufacturers obtain and test a specified number of customer vehicles with low mileage and then again with high mileage. Currently the high mileage vehicles are required to be tested within a one year period which begins four years after the end of production. Recognizing that typical vehicles driven in-use would not normally have accumulated much more than 50,000 miles during the four years following production, the "high mileage" requirement has historically been set at a minimum of 50,000 miles for each test vehicle. However, to gather data at higher mileage, the program has required one test vehicle from this high mileage sample to have accumulated at least 75% of the useful life mileage or for LEV III vehicles 105,000 miles. The LEV III program requires that ALL test vehicles from actual LEV III test groups must have a minimum odometer mileage of at least 105,000 miles. The LEV III requirement that all of the vehicles must have at least 105,000 miles is very difficult or near impossible to achieve within the required four to five year period after the end of production. Therefore, we recommend that the language be changed to require "at least one vehicle in each test

group" instead of "all vehicles in a test group" have a minimum odometer mileage of 105,000 miles or 75 percent of the full useful life mileage, whichever is less. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees with this request and has modified the regulatory language accordingly as part of the first 15-day changes.

5. Comment: EPA and ARB also have in-use compliance program (IUCP) requirements. The agencies conduct IUCP testing based on data obtained from IUVP testing. The vehicles tested in IUVP are tested "as received" without screening for proper maintenance. If the results from IUVP testing for a given test group exceed certain specified limits, then the manufacturer is required to run an IUCP test for that test group. The vehicles procured for IUCP testing are screened for proper maintenance. In the current program design the one "extra high mileage" IUVP vehicle is excluded from this IUCP "trigger" computation given there would only be one such vehicle and given it would have accumulated mileage at an abnormal rate (in excess of 20,000 miles annually). We recommend ARB exclude the one extra high mileage IUVP vehicle that would have either 75 percent of full useful life mileage or 105,000 miles, whichever is lower. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

   Agency Response: Under the IUVP program, manufacturers are required to test vehicles "as received" (rather than screening to exclude vehicles that have not been properly maintained and used) from every test group. If the vehicles tested do not meet the applicable emission requirements, a manufacturer must then conduct a subsequent In-Use Confirmatory Test Program on properly maintained and used vehicles to determine whether remedial action is required. The information received from the manufacturer-conducted testing is used to verify the efficacy of the manufacturer's durability demonstration required during the certification process. It is also used by ARB to target potential problem test groups for In-Use Compliance evaluation. Since the LEV III program requires that vehicles meet emission standards at 150,000 miles, it is appropriate to continue to consider the emission test results from the high mileage vehicle when deciding whether or not to trigger IUCP testing. Staff does not believe that it is reasonable to only look at 50,000-mile test results when making this determination, since 50,000 miles is only one third of full useful life.

Comments Concerning Supplemental FTP (SFTP) Requirements

6. Comment: The current LEV III regulations contain US06 PM standards of 10 milligrams per mile (mg/mi) for vehicles under 6,000 pounds GVWR and 20 mg/mi for vehicles over 6,000 pounds GVWR. These requirements are phased in starting in the 2017 MY. Tier 3 has the same phase in, but EPA staff discovered errors in their US06 PM test program (the EPA US06 test program was used to set the LEV III US06 standards), they adopted the following US06 standards:

Tier 3 US06 PM Standards		
Model Year	**US06(mg/mi)**	**In-Use (g/mi)**
2017	10	10
2018	10	10
2019	6	10
2020	6	10
2021	6	10
2022	6	10
2023	6	10
2024+	6	6

The LEV III 2-Sep-2014 Initial Statement of Reason (ISOR) reports that ARB intends to harmonize with the Tier 3 requirements and add an anti-backsliding provision. We support ARB staff's intent. However, the proposed regulatory changes to implement the harmonization inadvertently contain a number of errors specific to the in-use standards noted above. ARB Staff recognized the errors and plans to propose appropriate changes to harmonize with EPA with the exception of the anti-backsliding provision. We recommend harmonizing with the Tier 3 in-use requirements. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment refers to the discrepancy between this proposal and the federal Tier 3 program on the applicability of the interim in-use US06 PM emission standard. Staff agrees and is proposing modifications to address this discrepancy as part of the first 15-day changes.

7. Comment: The LEV II Supplement Federal Test Procedure (SFTP) regulations require 6,001-8,500 pounds GVWR light-duty trucks to certify at Adjusted Loaded Vehicle Weight (ALVW) rather than Loaded Vehicle Weight (LVW). Testing at ALVW rather than LVW is a temporary provision only in this specific weight class that does not apply to any other LEV II vehicles, to any LEV III vehicles, and has never applied to any federal testing. Federal vehicles that certify in California must meet California SFTP requirements. Without a change, automakers could be required to retest a federal vehicle for the sole purpose of testing at ALVW rather than LVW. This is a significant burden to comply with a temporary requirement that doesn't

provide commensurate benefits. We recommend allowing federal vehicles certifying in California to be tested (for the purposes of SFTP) at LVW rather than ALVW. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: The requirement to test light-duty trucks from 6,001-8,500 pounds GVWR certifying to the SFTP emission standards at ALVW is an existing LEV II requirement, and this rulemaking is not intended to revise the LEV II program. In addition, because modifying the program as the commenter has suggested would reduce its stringency, staff does not believe there is sufficient justification to make this change. Furthermore, manufacturers choosing to certify a federal vehicle in California have the option to test at ALVW in order to comply with both federal and California requirements simultaneously.

Comments Concerning High-Altitude Testing

8. Comment: LEV III seems to require high-altitude testing (either California or federal). Tier 3 allows compliance based on the attestation using good engineering judgment and appropriate testing. We recommend harmonizing the LEV III requirements with Tier 3. (This might be the intent, but we'd recommend clarifying the wording, which was previously identical to EPA.) (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

   Agency Response: Staff agrees with this request and has modified the regulatory language accordingly as part of the first 15-day changes.

Comments Concerning Medium-Duty Vehicles

9. Comment: For LEV 395/630, ULEV 340/570, LEV III requires E10 and 150k durability with combined NMOG+NOx. Even though Tier 3 generally requires E10 and 150k in 2020 MY (like LEV III), Tier 3 allows E0 and 120K for these particular standards through 2021 MY, because these standards sunset at the end of the 2021 MY. This allows manufacturers to certify using carry-over data for these standards since they are going away rather than requiring new certification data for just a year or two. The standard is combined but the Emission Data Vehicle must meet the NOx standard specified in Table 5. We recommend harmonizing with Tier 3 by allowing E0 and 120k just for these particular MDV standards through 2021 MY. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

   Agency Response: By MY 2020, we want all California vehicles to meet the 150k mile durability requirement and be tested on gasoline that is representative of California commercial gasoline. That's why all

light- and medium-duty vehicles must certify to LEV III standards in the 2020 and subsequent model years. A manufacturer should not be making future 2020 and 2021 MY plans for California based on the use of carry-over data from LEV II vehicles, when the regulations clearly say that these standards go away after MY 2019. Since these "interim Tier 3" vehicles (which are identical to Tier 2 vehicles) are no cleaner than LEV II vehicles, staff does not believe that it is reasonable to allow these "interim Tier 3" vehicles to be sold in California as alternatives to LEV III vehicles after LEV II vehicles go away.

10. Comment: The draft regulations require the manufacturer to calculate both MDV VEC and MDV Fleet Average credits. It should only require calculation of the method being used. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees with this request and has modified the regulatory language accordingly as part of the first 15-day changes.

11. Comment: We recommend allowing manufacturers to add the 8.5-10k with the 10-14k NMOG+NOx credits for the MDV Fleet Average purposes. This is consistent with the allowance for light-duty vehicles, consistent with EPA Tier 3 regulations for MDV, and consistent with ARB regulations for MDV VEC which effectively treat 8.5-14k as one category. This flexibility is especially important for the MDV category which has limited volume and few test groups compared to light-duty. And this flexibility would have no adverse environmental impact. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees with this request and has modified the regulatory language accordingly as part of the first 15-day changes.

Comments Concerning the 50°F Standards

12. Comment: The regulations specify the 50°F standards are 4,000-mile standards for NMOG+NOx and formaldehyde, but CO is not mentioned. We recommend inserting "CO" where "NMOG+NOx and formaldehyde" is listed in §1961.2(a)(4), Page A-7. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees with this request and has modified the regulatory language accordingly as part of the first 15-day changes.

Comments Concerning PM Certification Requirements

13. Comment: LEV III and Tier 3 contain different methods on how to select PM test data vehicles. LEV III requires testing 25% of the "test group," while Tier 3 requires testing 25% of the "durability data group" (or "durability group"). "Test groups" and "durability groups" are not equivalent. A durability group can be comprised of multiple test groups in some situations. Use of these two different terms results in a significant alignment discrepancy. Manufacturers will be subject to additional work in order to demonstrate compliance with both agencies' programs.

    By default, California's requirement to test "test groups" is expected to result in additional testing over the federal program. While it is possible that California's testing could result in adequate testing to cover the federal requirements, ARB's additional requirement that ARB can select which of the test groups must be tested could result in a disproportionate amount of tests on a couple of big durability groups but might not cover the 25% of durability groups needed for EPA's requirements.

    The new PM testing requirements under LEV III and Tier 3 significantly increase the amount of PM tests that manufacturers must conduct compared to requirements under the LEV II and Tier 2 requirements. In addition, PM testing is time consuming and resource intensive, and due to its difficulty, it might increase over test void rates. We believe that EPA's durability group requirement will provide more than adequate amounts of PM test data, while also balancing the resources necessary to conduct PM testing.

    Also, it is important to keep in mind that both LEV III and Tier 3 will require significant amounts of PM testing in IUVP at both low and high mileage. The industry voiced concerns about the large amounts of testing that would be required in IUVP, but both agencies only allowed limited relief. Both programs would require 50% of all of the vehicles in each "test group" tested under IUVP to receive a PM test. Hence IUVP should give more than enough testing coverage of every test group. Testing even more vehicles as part of certification for California would add significantly to an already huge burden.

    For these reasons, we urge ARB to align with EPA's use of "durability groups." (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response:

    Staff does not agree with this comment. Below is a statistic based on the certification data from 2014 model year vehicles, excluding battery

electric vehicles and test groups that are certified by using assigned deterioration factors (which are very small in number).

Manufacturer "A": 29 durability groups for certification of 34 test groups.
Manufacturer "B": 33 durability groups for 33 test groups.
Manufacturer "C": 36 durability groups for 45 test groups.
Manufacturer "D": 32 durability groups for 35 test groups.
Manufacturer "E": 26 durability groups for 28 test groups.
Manufacturer "F": 32 durability groups for 41 test groups.
The maximum number of test groups per durability group is two in each of these manufacturers.

The LEV III 3 mg/mi PM standard is being phased in at 10/20/40/70/100 percent. So the required testing of 25% of the test groups being certified to the stringent PM standard should not create any huge increase in testing burdens. Nor is there concern about the potential for a disproportionate increase in PM testing should there be a durability group covering a large number of test groups as claimed by the commenter, which was not observed in past certification. Furthermore, no individual manufacturer has demonstrated that this is a concern.

Comments Concerning Cleaner Federal Vehicles

14. Comment: When manufacturers certify a federal vehicle in California under LEV III test procedures, the vehicle must meet federal FTP exhaust and cold CO emissions, but must meet the California requirements for evaporative emissions, OBD II, SFTP emissions, 50°F exhaust emissions, highway NMOG+NOx, greenhouse gas emissions, and emissions warranty. The ISOR Appendix B, Section H.1.4.1.1, provides a clear exemption for the 50°F exhaust emission requirements for Tier 2 Bins 3, 4 and 8 and Tier 3 transitional Bins 85 and 110. However, several of the LEV III requirements listed above are 150,000-mile durability requirements (e.g., SFTP). Vehicles certified to federal Bins 3, 4, 8, 85, and 110 will be certified to 120,000-mile durability. We understand these federal vehicles certified in California would not be considered LEV III and thus would not be required to meet the 150,000-mile durability. We recommend explicitly stating that these vehicles will be certified to 120k (FTP, SFTP, and highway NOx/NMOG+NOx). Alternatively, ARB Staff could make their intent clear in the Final Statement of Reasons. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Federal vehicle standards are defined in California's regulations by referencing the section(s) of the Code of Federal Regulations in which the federal standards are defined. Staff does not believe that is appropriate to independently define federal

vehicle standards. Part I, Section H.1.4(g) of the LDTPs explains that a federal vehicle certified to 120,000-mile durability may be sold in California under the Cleaner Federal Vehicle Provision as an alternative to a LEV II vehicle certified to 120,000-mile durability. The California requirements for evaporative emissions, OBD II, SFTP emissions, 50^{o}F exhaust emissions, highway NMOG+NOx, greenhouse gas emissions, and emissions warranty requirements that apply to the LEV II vehicle (on a 120,000 mile durability basis) also apply to the Cleaner Federal Vehicle (on a 120,000 mile durability basis).

15. Comment: It is not clear in the requirements how federal vehicles should be labeled on the emission certification label. We would like to confirm our understanding that ARB will certify these vehicles as "Federal Bin 85 [110, 3, 4, etc.]" in the Executive Order, and the label should follow this. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: ARB will certify federal vehicles as "Federal Bin 85 [110, 3, 4, etc.]" in the Executive Order, and the label should list the federal bin designation.

Comments Requesting Clarification of Existing Requirements

16. Comment: ARB's requirements in LDTP section G.2.3 "LEV III PM" Requirements regarding vehicle categories and selection years should be clarified. As written, it is not clear if PC/LDT and MDV test groups are treated separately or combined, and we would appreciate clarification in the regulations clarify how these test groups are selected. Further, the selection year restrictions need to be clarified, because both 2-years and 3-years are included in the test procedures. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff has added clarifying language to the LDTPs as part of the first 15-day changes.

17. Comment: Definitions: "Highway Test Procedures" means the Federal Test Procedure as set forth in Subpart B, 40 CFR §1066.840 Part 86, as modified in Part II of the LDTPs, except that emissions shall be measured using the Highway Driving Schedule as set forth in LDTP Part II, Section F. Comment: "Subpart B", unclear if this is referring to Part 1066 or Part 600, since §1066.840 is actually in Subpart I. Highway test procedure guidance is in 40 CFR Part 600, subpart B. Suggest modifying the above wording to: "Highway Test Procedures means the Federal Test Procedure as set forth in 600 Subpart B or CFR §1066.840 as modified in Part II of these test procedures with the migration provisions of §600.111-08 introduction."

(Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees with these changes and has modified the regulatory language accordingly as part of the first 15-day changes.

18. Comment: LDTP section E.1.6 "Highway NMOG+NOx Standard" incorporates the HWFET as follows "(HWFET; 40 CFR §1066.840 ~~600 Subpart B~~, which is incorporated herein by reference)." We suggest modifying the above wording to: "HWFET; per the Federal Test Procedure as set forth in 600 Subpart B or CFR §1066.840 as modified in Part II of these test procedures and §600.111-08 introduction". (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees with these changes and has modified the regulatory language accordingly as part of the first 15-day changes.

19. Comment: LDTP section G.3.4 "Highway Fuel Economy Test" says: "The exhaust emissions, including non-methane organic gas emissions, shall be measured from all exhaust emission data vehicles tested in accordance with the federal Highway Fuel Economy Test (HWFET; 40 CFR §1066.840, 600, Subpart B)." We suggest modifying the above wording to "HWFET; per the Federal Test Procedure as set forth in 600 Subpart B or CFR §1066.840 as modified in Part II of these test procedures and §600.111-08 introduction". (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees with these changes and has modified the regulatory language accordingly as part of the first 15-day changes.

20. Comment: There is a typographical error in LDTP section E.1.4.2. This section references section "D.10." However, there is no section"D.10." The correct reference should be "D.1.10." (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff has corrected this typographical error as part of the first 15-day changes.

Comments Concerning NMHC to NMOG Adjustment Factors

21. Comment: Some inconsistent language. LDTP Part I, D.1.10 specifies you "must" use the NMOG factors specified in this part (ex, 1.10 for FTP & 1.03 for HWY & SFTP) for California fuels. However in Part II, C. "40 CFR Part 1066 – Vehicle-Testing Procedures", C.2.1 (which specifies ARB LDTP Part II, section 100.3 fuels), when coupled with Part II. C.7 "NMOG Determination", says "A manufacturer may use the conversion factors in sections D.1.10 and D.2.7.5 as alternatives to those set forth in this section §1066.635. The two requirements (above) are inconsistent; we recommend harmonizing with Tier 3 NMOG factors & equations. Additionally "leviii14isorappd" requires §1066.635. With respect to fuel harmonization / reciprocity, don't see any guidance on testing LEV III vehicles with Tier 3 fuels or vice versa, Tier 3 vehicles tested on LEV III fuel. These could happen with evaporative exhaust testing. Again we recommend harmonization of NMOG factors & equations per §1066.635 regardless of which fuel is tested. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff has modified the regulatory language as part of the first 15-day changes to allow use of Part II, C. "40 CFR Part 1066 as an alternative to Part I, section D.1.10 for vehicles certifying FTP emission standards using California E10 certification gasoline and has added guidance on testing LEV III vehicles with federal gasoline. Guidance on testing federal Tier 3 vehicles using California fuel is decided by EPA, not California. Therefore, no language has been added the LDTPs to address this concern.

22. Comment: LDTP Subpart G §1066.635 NMOG Determination: Comments: Some inconsistent language. LDTP Part I, D.1.10 specifies you "must" use the NMOG factors specified in this part (ex, 1.10 for FTP & 1.03 for HWY & SFTP) for California fuels. However Part II, C. "40 CFR Part 1066 – Vehicle-Testing Procedures", C.2.1 (which specifies ARB 100.3 fuels) coupled with Part II. C.7 "NMOG Determination", states "A manufacturer may use the conversion factors in sections D.1.10 and D.2.7.5 as alternatives to those set forth in this section §1066.635." The two requirements are inconsistent. We recommend harmonizing with Tier 3 NMOG factors and equations. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: See response to Comment 21.

23. Comment: "For LEV III vehicles and LEV II vehicles that are certified to the SFTP Exhaust Emission Standards in LDTP section D.1.2 and/or the Highway NMOG+NOx Standard in section E.1.6, using the

California Gasoline Fuel Specifications set forth in Part II, section 100.3.1.2, manufacturers must multiply NMHC measurements by an adjustment factor of 1.03 before adding it to the measured NOx emissions and comparing with the NMOG+NOx standard to determine compliance with that standard." This applies to E10 only (section 100.3.1.2); it should be harmonized with §1066.635. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Language has been added as part of the first 15-day changes to clarify that the adjustment factor of 1.03 applies to all certification gasolines. This is consistent with §1066.635.

24. Comment: "For LEV III vehicles and LEV II vehicles that are certified using a gasoline fuel that contains an ethanol content greater than that allowed by the California Gasoline Fuel Specifications set forth in LDTP Part II, section 100.3.1.2 and less than or equal to 25 percent ethanol, the adjustment factor that must be used to demonstrate compliance with this paragraph is calculated using the following formula:
Adjustment factor = 1.0302 + 0.0071 x volume percent fuel ethanol"
Comments:
(1) Implies this FTP factor would apply for HWY and SFTP. Should be focused on just the FTP.
(2) No guidance for FTP testing fuels containing ethanol <E10. The adjustment factor equation should be expanded for this range of fuels, again for FTP only.
(3) The combinations of NMHC to NMOG factors, equations, test cycles, regulations (LEV III & Tier 3) and fuels are getting very complex to manage software and logistics wise. This can be greatly simplified and reduce the chance for errors by just harmonizing with Tier 3 §1066.635. With rounding this achieves ARB's desire to essentially retain the 1.10 factor for E10 as follows:
    E9.4 → 1.09694 ~ 1.10 (Tier 3 confirm tolerance)
    E9.6 → 1.09836 ~ 1.10 (LEV III & Tier 3 blend tolerance)
    E10.0 → 1.10120 ~ 1.10 (LEV III & Tier 3 blend tolerance)
    E10.2 → 1.10262 ~ 1.10 (Tier 3 confirm tolerance)
Although rounding the above appears to harmonize LEV III & Tier 3 NMOG factors, we do not recommend this rounding approach. Tier 3 regulations require carrying all digits forward through the final mass calculations, then rounding of the results; therefore we still will have 2 different processes, factors and equations. We believe harmonizing LEV III with Tier 3 §1066.635 (as noted above) greatly simplifies the NMOG calculation process and still achieves ARB's requirement for a 1.10 factor; it reduces the burden for OEM's and agencies alike. It also is a common process whether using LEV III or Tier 3 fuels like for evaporative exhaust testing. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response:
(1) Language has been added as part of the first 15-day changes to clarify that this FTP factor only applies for FTP compliance.
(2) Language has been added as part of the first 15-day changes to provide guidance for FTP testing fuels containing ethanol <E10.
(3) There may be slight differences between the adjustment factors that are calculated using §1066.635 and the assigned adjustment factors that are currently in the LEV III program. However, calculation of the adjustment factors using §1066.635 is complicated and depends on the fuel batch. Staff does not believe that the added complexity of §1066.635 is necessary given the slight differences between the calculated adjustment factors and the assigned adjustment factors. Therefore, we believe it is appropriate to allow the continuing use of the assigned adjustment factors for those manufacturers that may produce California-only vehicles in the future.

Comments Concerning Editorial Changes

25. Comment: LDTP Subpart I §1066.831 is amended as follows: "1. Replace all references to "US06 Highway" with "US06 Bag 2…" (in multiple locations)." Comment: Basically a naming convention change but creates inconsistent descriptors between Tier 3 & LEV III. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: The term "US06 Bag" is used in multiple locations throughout the LDTPs. It is, therefore, appropriate to retain the references to "US06 Bag 2" in order to maintain consistency in the terminology used in this section and the rest of the LDTPs. In addition, since there are no emission or regulatory impacts associated with retaining the current LDTP language, staff believes it is not necessary to make this change.

Comments Concerning the Cold Temperature Test Procedures

26. Comment: The proposed 45-day language for LDTP section 200.1 says: "California applicability. No change to §86.201, except as follows. Amend subparagraph 86.201-94(a) as follows: This subpart describes procedures for determining the cold temperature carbon monoxide (CO) emissions from 2015 and later through 2021 model year new passenger cars, light-duty trucks, and medium-duty vehicles (excluding natural gas, diesel-fueled, and zero-emission vehicles)." Comment: There is a known migration issue with §86.201 due to the current cold temperature procedures being deleted in the CFR. This is expected to be corrected in the near future with new rulemaking. In the interim, suggest adding this provision to this section: "You may follow previously published Tier 2 cold test procedures before MY 2022, or elements of both previous and new, using good engineering

judgment…" (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: While EPA chose to stop publishing the Tier 2 (previously published) cold temperature test procedures, those procedures continue to apply. Instead, EPA replaced that language with language in §86.201 that says how to manage the transition from the old (previously published) procedures in 40 CFR Part 86, subpart C, to the new procedures in 40 CFR Part 1066. In February 2015, §86.201 was revised to update that description to more carefully cover the transition (still without reprinting the old procedures, other than the test fuel). The LDTPs currently incorporate the Tier 2 (previously published) cold temperature test procedures. In addition, the February 2015 revisions to §86.201 were made as part of the second 15-day changes. Therefore, no additional changes to the LDTPs are needed.

3. Comments Concerning the LEV III Evaporative Emissions Regulations

27. Comment: 40 CFR §86.1801-01 Applicability. Section 1.7: "For instances in this document where an option is provided to follow provisions from either Title 40 CFR Part 86 or Title 40 CFR Part 1066, the migration schedule set forth in Title 40 CFR 86.101(b) (April 28, 2014) shall apply." Comment: §86.101 (a)(8) & (9) are also applicable. The term "option" appears to be referring to a limited number of specific Part 1066 references. It is unclear if the general migration path to Part 1066 procedures is covered under is language. The evaporative test procedures refer to many Part 86, subpart B exhaust test procedures which need a migration path to Part 1066. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Regarding the comment that "§86.101 (a)(8) & (9) are also applicable," because California's existing evaporative emission test procedures already include the same requirements for testing with ethanol-containing fuel, staff does not believe it is necessary to reference 40 CFR §86.101 (a)(8). For 40 CFR §86.101 (a)(9), the section applies to exhaust emission testing, and therefore, staff does not believe the section needs to be specifically referenced by California's evaporative emission test procedures. Concerning the comment on the clarity of the migration path language, staff is proposing, as a first 15-day change, language in section I.A.1.7 of the evaporative emission test procedures that provides additional guidance on the migration path to the federal Part 1066 procedures.

28. Comment: Calibrations: "1. Evaporative emission enclosure calibrations are specified in 40 CFR §86.117-90. For the purposes of this section III.B, methanol shall mean ethanol when testing with

ethanol-containing fuel. Methanol measurements may be omitted when methanol-fueled vehicles will not be tested in the evaporative enclosure. Amend 40 CFR §86.117-90 to include an additional section III.B.1.1., to read:" Comment: §86.117-90 was updated / revised back in the mid 1990's to §86.117-96, and more recently in Tier 3. Was it ARB's intention to keep referring to this older version with the proposed LEV III rulemaking? Additionally the ethanol / methanol recovery (or calibration) tolerance in §86.117-90 is ±2%, which is not harmonized with Tier 3's §86.117-96(c)(1)(ix), which specifies a ±5% tolerance. ±2% is not achievable on a routine basis and is burdensome, recommend harmonization with Tier 3. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Because this rulemaking focuses primarily on Tier 3 changes, staff did not consider modifications to CFR references that were not impacted by the Tier 3 rulemaking. However, if warranted, modifications may be considered as part of a future rulemaking. Additionally, California's evaporative emission test procedures allow a ±6% tolerance for ethanol/methanol recovery, which provides even greater margin for error than the ±5% required in Tier 3's §86.117-96(c)(1)(ix).

29. Comment: Calibrations: **1.1.3.5**: "Inject into the enclosure a known quantity of propane between 0.5 to 1 ~~2 to 6~~ grams and/or a known quantity of methanol **in gaseous form** between 0.5 to 1 ~~2 to 6~~ grams. ~~For evaporative emission enclosures that will be used for testing motor vehicles certified to the reduced evaporative standards in sections I.E.1.(c) and (d), use a known amount of propane or **gaseous** methanol between 0.5 to 1.0 grams.~~"
Comment: Delete "…in gaseous form…". This form of injection is impractical due to the low vapor pressure of pure ethanol and it is not harmonized with EPA evaporative language per 86.117-96 (c)(1)(vii) which states "Inject into the enclosure…grams of pure methanol…The injected quantity may be measured by volume flow or by mass measurement.". Also ethanol should be identified as well; it is likely done elsewhere in the evaporative regulations. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Regarding the comment about the requirement to inject ethanol "in gaseous form" during the retention check, this is an existing requirement, and because the issue was not communicated to staff until after the posting of the 45-day notice, staff has not been able to adequately evaluate the commenter's contentions. Therefore, staff is not proposing modifications to the requirement in this rulemaking, but will continue discussions with the industry on this matter. Regarding the comment that the injection requirement should be

amended to clarify that it also applies to ethanol testing, staff disagrees because language within the 45-day notice package already addresses this in section III.B, which states “For purposes of this section III.B, methanol shall mean ethanol when testing with ethanol-containing fuel.”

4. Comments Concerning Refueling Test Procedures

30. Comment: Comment: Refers to several Part 86 subpart B sections but w/o a migration path to Part 1066. Need some provision in the refueling emissions test for this migration path per 86.101. Suggest adding the following guidance to Part B: “Migration of the Part 1065 and Part 1066 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.” (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: For the purpose of additional clarity, staff is proposing, as a first 15-day change, language in the refueling emission test procedures that provides additional guidance on the migration path to the federal 40 CFR Part 1066 procedures.

5. Comments Concerning Certification Fuels

31. Comment: ARB allows use of Tier 3 fuel and will test on the same fuel used to certify the vehicle. For LEV II, this is clear, see LDTP section 100.3.1.1 (page B-41). It’s not as clear for LEV III, (see LEV III LDTP section 100.3.1.2, page B-41). We recommend repeating the language in section 100.3.1.1 in section 100.3.1.2, to be clear that the manufacturer can certify using either Tier 3 or LEV III fuel, and the Executive Officer will conduct compliance testing using the same fuel. We recommend similar changes to light- and medium-duty testing of FFVs on E85 and testing of heavy-duty vehicles on E10, E85, and diesel. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees with this request concerning certification gasoline and certification E85 and has modified the regulatory language accordingly as part of the first 15-day changes. Certification diesel is outside the scope of this rulemaking.

32. Comment: Additionally, in both LDTP sections 100.3.1.1 and 100.3.1.2 (page B-41) states, “Use of this fuel for evaporative emission

testing shall be required as specified in the 'California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles." We would recommend clarifying this language. Perhaps changing "this" to "these" in the emphasized text above. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees with this request and has modified the regulatory language accordingly as part of the first 15-day changes.

33. Comment: The LEV III E10 certification gasoline specifications in the table lists the ethanol limits as: Ethanol 9.6 – 10.0 volume %. This is the same tolerance as Tier 3 (good), but is too tight a tolerance to maintain from the suppliers analysis to the OEM's confirmatory analysis (recheck). Doesn't account for variation in the ASTM procedures plus the possibility the blend was near either the upper or lower limit. To resolve this, Tier 3 utilizes two tolerances, one is a "blend" tolerance at the gas supplier, the other is a "confirmatory" tolerance at the OEM or agency. We recommend retaining the current 9.6 – 10.0% ethanol as a blend tolerance, then adding a marginally wider tolerance for confirmatory testing. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: California's certification fuel specifications have never had any sort of formal tolerance for the purpose of determining compliance, as commercial fuels do. As an alternative to this request, staff has widened the ethanol limit to 9.2 – 10.0 volume % to address the concern expressed in this comment as part of the first 15-day changes.

6. Comments Concerning the Non-Methane Organic Gas (NMOG) Test Procedures

Comments Concerning the 1993 through 2016 MY NMOG Test Procedures

34. Comment: Part A.5: For compressed natural gas vehicles, one still has to multiply the CH_4 mass by the methane RAF (assuming this is still in the exhaust emission regulations) before adding to the NMHC mass; for 2015+ MY vehicles, the (CH_4 mass x methane RAF) is to be added to NMHC mass prior to adding to NOx mass. With the adoption of greenhouse gas regulations curtailing CH_4 emissions, do RAFs still need to be comprehended in the LEV III regulations? (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Yes, compliance with emission standards for the purpose of certification require that "For vehicles operating on natural gas, the methane mass emission value shall be multiplied by 0.0047 (the methane reactivity adjustment factor) and added to the NMOG mass emission value and the NOx mass emission value. This result shall be compared to the NMOG+NOx exhaust emission standards to determine compliance with the standards."

Comments Concerning the 2017 and Subsequent MY NMOG Test Procedures

35. Comment: Multiple direct references to CFR Parts 1065 & 1066 without the rollout provisions like that in §86.101. Industry needs this migration path to be harmonized with Tier 3. Suggest a guidance be included in this appendix d, Part A, clarifying this migration path consistent with §86.101. We suggest adding the following guidance to Part A: "Migration of the 1065 and 1066 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." (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: The references to Parts 1065 & 1066 replace equations that are in the current NMOG Test Procedures with references to identical equations in the CFR. Since these equations are identical, no rollout provision is needed. Therefore, migration provisions from Part 86 to Part 1066 or Part 1065 are not needed.

36. Comment: Part A.3: The requirement for compressed natural gas (CNG) certification has changed; it used to be that NMHC by gas chromatograph (GC) was required. Now it is a requirement of NMHC by flame ionization detector (FID) with a provision for alternative methods according to §1066.635. If HC speciation is no longer a regulatory requirement, why is it still referenced in this regulation? (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: To harmonize the test procedures with 40 CFR §1066.635, hydrocarbon speciation for CNG is no longer required. ARB staff chose not to remove the hydrocarbon methods from the test procedures, as they may still be useful to manufacturers or other laboratories that might want to determine a more detailed emission profile. It was not intended as a requirement. Language has

been added to the test procedures for clarification as part of the first 15-day changes.

37. Comment: Parts C.5.5.1, D.5.3, and E.5.3: Define zero air as having < 1 ppmC HC contamination. This should be updated to Part 1065.750 requirements with < 50 ppbC HC contamination or better. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: The requirement has been changed to <50 ppbC as part of the first 15-day changes.

38. Comment: Parts D.2.2 and E.2.2: "Tedlar". In the 2012 version, Tedlar was removed as an acceptable bag material, but in this ISOR, it's been added it back as acceptable. Is this intended or is this an error? (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: There were two different versions of the California NMOG Test Procedures published in 2012. In the Test Procedures, as amended March 22, 2012, Tedlar® had been replaced by Kynar® as the primary bag material. This was due to the lack of commercial availability of Tedlar®.

    As amended March 22, 2012:

    Section D.2.2, E.2.2:

    2.2 The samples are received by the laboratory in Kynar® bags, which are sub-sampled into a GC for separation and analysis.

    However, the procedures did allow for the continued use of Tedlar® as an alternate bag material, just like any other alternate sample container.

    Section D.4.1, E.4.1

    4.1 Kynar® (polyvinylidene fluoride) bags, 4 mil in thickness, nominally 5 to 10 liters in capacity and equipped with quick-connect fittings, are typically used to contain the samples. Other sample collection containers, such as bags made of Tedlar® (polyvinyl fluoride) film or nickel-coated stainless steel canisters, may be used, provided they are made of non-reactive material and do not cause sample loss or contamination.

    Subsequent to the board hearing approving these methods, the ARB found a supplier for Tedlar®. While making other revisions to the

method in 2012, we chose to add Tedlar® back as a primary bag material, along with Kynar® and Solef®.

As amended December 6, 2012.

Section D.2.2, E.2.2:

2.2 The samples are received by the laboratory in Tedlar®, Kynar®, or Solef® bags, which are sub-sampled into a GC for separation and analysis.

The language remains unchanged in both 2014 versions (through model year 2016 and model year 2017 forward).

39. Comment: Parts D.4.1 and E.4.1: "Tedlar". In the 2012 version, Tedlar was allowed only if it did not add contamination, but in this ISOR, Tedlar is added back as one of the standard bag materials (clean or not). Is this intended or is this an error? (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: All bag materials should be clean. As part of the first 15-day changes, language has been added to both the current version of the NMOG Test Procedures and the 2017 and subsequent model year version of the NMOG Test Procedures to clarify this.

40. Comment: Parts D.4.2 and E.4.2: If injecting into the GC with a gas-tight syringe, only Tedlar is allowed for the original bag material. This should be changed to allow for Kynar and Solef, as well. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This was an oversight. As part of the first 15-day changes, language has been added to both the current version of the NMOG Test Procedures and the 2017 and subsequent model year version of the NMOG Test Procedures to clarify that all three bag types are allowed.

41. Comment: Part E.3.2: "Tedlar". Remove the word Tedlar from the phrase "…is stable for at least 24 hours in the Tedlar sampling bags…" (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: As part of the first 15-day changes, language has been added to both the current version of the NMOG Test Procedures and the 2017 and subsequent model year version of the NMOG Test Procedures to clarify that the concentration of hydrocarbons in the

range of interest is stable for at least 24 hours in the Tedlar®, Kynar®, or Solef® sampling bags.

Additional language has been added to both the current version of the NMOG Test Procedures and the 2017 and subsequent model year version of the NMOG Test Procedures to clarify that, if any alternate sampling materials are used, as allowed by Section 4.1, the stability must be determined.

42. Comment: Part G.1.3: "This section addresses emissions, in concentration units, of each test phase. Calculations to use those concentrations to determine NMOG mass emissions for FTP testing are given in 40 CFR Part 1066, Section 1066.935, "NMOG determination." Part 1066.935 should be changed to Part 1066.635. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: The typographical error has been corrected as part of the first 15-day changes.

43. Comment: Part G.2.1: This section states that "Non-methane hydrocarbon weighted mass emissions (NMHCwm) can be determined by either FID or GC," which directly contradicts the chart in Part A.3. The chart shows NMHC by GC is not an approved method (e.g., "The analyses specified in the table below shall be performed to determine mass emission rates of NMOG…"). Note: the wording used is SHALL. Conflicting language needs to be corrected. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: ARB staff chose not to remove the hydrocarbon method from the test procedures, as it may still be useful to manufacturers or other laboratories that might want to determine a more detailed emission profile. It was not intended as a requirement. Language has been added to the test procedures for clarification as part of the first 15-day changes.

44. Comment: Parts G.3.3.1, G.4.3.1, and G.5.3.1: The ARB atomic masses for carbon and hydrogen, respectively, are 12.01115 and 1.00797 grams/mole, while the EPA (as per 1065.1005 (2)(2)) values are 12.0107 and 1.00794 grams/mole. Note: the EPA values are the same as reported by NIST. Should be harmonized with Tier 3 and NIST. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Current ARB staff is uncertain where the values shown in the Test Procedures came from. Both the current version of the NMOG Test Procedures and the 2017 and subsequent model year

version of the NMOG Test Procedures have been corrected to be consistent with NIST/EPA values:

H – 1.00794
C – 12.0107

7. Comments Concerning the Test Procedures for 2018 and Subsequent Model Hybrid Electric Vehicles

General Comments

45. Comment: The HEV/PHEV test procedures section is extremely complex due in part to the complexity of these vehicles. As the technology matures and continues to change we feel the ARB should assure they have regulatory flexibility to allow "alternative procedures upon Executive Officer approval". In the current proposal (45-day version dated September 2, 2014) there are several statements under specific elements of the test procedures indicating "Alternative procedures may be used if approved in advance by the Executive Officer of the Air Resources Board". We feel it is important to move or add this clarifying statement in a position that it will cover the whole section and not just specific elements of a section. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: The language allowing alternative procedures with Executive Officer approval is provided in the general provisions for each test cycle required for both HEV and PHEV testing. This approach was used to provide the most assurance that regulatory flexibility is being provided for every test cycle required for testing. No modifications were made in response to this comment.

46. Comment: Based on the 45-day version of the PHEV test procedures (dated September 2, 2014), we are finding the text (as written) could double the number of tests required to certify. Based on subsequent discussions with ARB staff we understand that wasn't the intent, but without seeing the corrected text we are compelled to comment on this concern. The ARB staff has worked hard to streamline and focus the PHEV test procedures, which we applaud. This is a concern over the way the text can be interpreted which could require unwanted/unnecessary testing (doubling the current PHEV test burden, triple what is required for non-PHEV vehicles). In addition to doubling the number of tests, we are equally concerned with the length of time PHEV charge-depleting tests require which are many multiples greater than non-PHEV vehicles. This will have an adverse impact on already constrained laboratory capabilities working on critical LEV III/Tier 3, GHG, and ZEV implementation; hence further clarifications/corrections in the proposed regulations are necessary. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of

Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: As industry recognizes, staff made a concerted effort to streamline and harmonize the PHEV test procedures with the federal procedures to reduce test burden. Over the course of the first and second 15-day notices, several revisions and added definitions were included to eliminate various interpretations that could be read and were inconsistent with the intent of the requirement. Additional changes like requiring testing only in the worst case mode similarly were made to reduce any additional test burden of PHEVs relative to conventional vehicles. However, given the complex design of PHEVs, testing of these vehicles inherently requires sufficient testing to accurately assess emissions and to ensure compliance with standards.

47. Comment: Applicability: Effective for 2018+ MY
Comment: Required for 2018+ MY; OEMs also should be allowed the option of adopting these test procedures for earlier model year vehicles including LEV II. Doing so maintains the harmonization path to Part 1066 and provides quicker migration to the new procedures. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: 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" was modified as part of the October 23, 2014 "Public Hearing to Consider Amendments to the Zero-Emission Vehicle Regulation" to allow manufacturers to use these test procedures prior to the 2018 model year. These proposed changes are not yet final.

Comments on Part F

48. Comment: Part F.: Introduction, "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," unless otherwise noted."

Comment: Concern over "…unless otherwise noted." This phrase appears to override the previous sentence on roll out guidance from Part II, Subpart A. Subpart F has many direct references to Part 1066 with amendments; this creates unintended early shortcuts to Part 1066 procedures.

(Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has removed the text "unless otherwise noted" as a first 15-day modification.

49. Comment: Branching: Additionally, the Part 1066 sections referenced in Subpart F in turn reference many more Part 1065 & 1066 sections which will also be required. These secondary requirements in turn branch out to tertiary requirements, then quaternary references, and so on. Following this branching of requirements, it is not difficult to bring in large sections of Parts 1065 & 1066 for 2018 MY, of which certification testing occurs in calendar year 2017, of which vehicle development testing is now. A couple of examples of this branching are:

F.6.3.8: (d) "Follow the exhaust emission measurement procedures specified in 40 CFR §1066.410 through §1066.425…"
Comment: "40 CFR §1066.410 through §1066.425" brings in at least parts these secondary requirements in:
1066.105, 1066.110, 1066.125, 1066.210, 1066.310, 1066.415, 1066.420, 1066.425, 1066.805, 1066.1010
1065.140, 1065.365, 1066.520, 1065.545, 1066.590, 1065.595, 1065.750
These secondary requirements in turn bring in tertiary requirements, and so on.

F.8.1.3 "Subparagraphs (b)(3)(i) through (e)(2)(iii). [No change]"
Comment: Brings in §§ 1066.110, 1066.610, 1066.410, 1066.415, 1066.420, 1066.425, and all of the diesel heated FID requirements from Part 1065 which in turn brings in a lot of other requirements on analyzer performance, delay times, contamination, leak checks, drift correction, etc.

Suggestion: To remediate this roll-out concern, we suggest that in Section F. Introduction, the phrase "…unless otherwise noted" be modified to make it clear that the roll out provisions of Part II Subpart A guidance to Part 1066 procedures are still in effect. This is somewhat complex since the hybrid procedures now rely on the Part 1066 test (language) plus instructions with ARB revisions. One solution could be to modify the phrase to "…unless otherwise noted in accordance with the roll-out provisions in Part II, Subpart A." (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has removed the text "unless otherwise noted" as a first 15-day modification.

50. Comment: No guidance on running 20°F & 50°F testing. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff has provided guidance for 20°F and 50°F testing in the first 15-day modifications.

51. Comment: Sections F.6.1.3 through F.6.3.6: General note on the number of samples per test. The comments below (Comments 52, 54, 55, 56, and 58) revolve around some conflicting language in several sections, specifically, the amount of diluted sample bags and PM filters needed per test. Some sections say 1 sample per phase; others say 1 sample per UDDS. Suggest clarifying this by allowing diluted bags or PM filter samples per phase, or UDDS. Secondly for PM (only) also allowing 1 PM filter for the entire test (2 UDDS's) using single filter technology. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff has clarified the number of sample bags and PM filters needed per test in the first 15-day modifications.

52. Comment: Section F.6.1.3: "A single sample is collected for a full UDDS cycle (cold-start or hot-start)". This conflicts with several sections in section 6.3 and subpart G which allow 1 PM filter or diluted sample bag per phase or UDDS. Suggest clarifying this sentence to allow gaseous or PM samples per phase, UDDS, and for PM (only) per test (single filter technology – important for harmonization with Tier 3 and for conventional vehicles per leviii14isorappb procedures, Part II, subparts A & C). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

53. Comment: Section F.6.2.4: UDDS preconditioning, "After completing the preconditioning drive, battery state-of-charge ~~shall~~ may be set such that the SOC Criterion is satisfied by applying the SOC Net Energy Change Tolerances in section F.9. The battery state-of-charge may be set by driving additional UDDS cycles." This setting of the SOC should not be allowed if J1711 Appendix C is used. Appendix C is currently not allowed for HEV's but is requested under a separate comment. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

54. Comment: Section F.6.3.1: "The Urban Emission Test consists of a cold-start test and hot-start test as described in section F.6.1.3." Section F.6.1.3 requires "A single sample is collected for a full UDDS cycle (cold-start or hot-start)." This is contrary to F.6.3.2 and F.6.3.3 which allows §1066.815(b)(1), one filter per phase. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

55. Comment: Section F.6.3.2: Specifies the following PM filter sampling techniques per §1066.815(b).

    (b)(1) - 3 or 4 phase FTP with 1 filter/phase. May omit phase 4 filter and substitute phase 2.
    Should limit to traditional 4 phase hybrid testing per section F.6.3.3 amendments. Again, it conflicts with sections F.6.1.3 and F.6.3.1 which requires 1 sample per UDDS, but is ok if 1 filter / phase was intended.

    (b)(2) – 4 phase FTP with 1 filter / UDDS
    Comment: Ok if 1 filter / UDDS was intended.

    (b)(5) – Deleted, does not allow single filter PM testing for a 4 phase FTP, flow weighted.
    Comment: Four phase single filter sampling should be allowed. This single filter option is an important new technology that should be allowed for harmonization with Tier 3 and for conventional vehicles per leviii14isorappb procedures, Part II, subparts A & C. In support of option (b)(5) above, it should allow flow weighting per (b)(5), calculate flow weighted PM mass per §1066.605(e)(3), then calculate composite PM mass per §1066.820(c)(3).

    Section F.6.3.2: Also requires F.6.5 which is the traditional filter composite equation. In support of (b)(5) above (single filter), it should allow §1066.820(c)(3).
    (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

56. Comment: Section F.6.3.3: "Amend subparagraphs (b)(1): You may collect a separate PM sample for transient and stablilized portions of the cold-start UDDS and the hot-start UDDS. This may be done by sampling with four bags." Comments: Correct spelling typographical

error from “stabilized” to “stabilized.” Assume this is intended to require traditional 4 phase testing for hybrids. (Post script, the wording “bag” is not appropriate since this is clearly intended for PM filters by “phase”). Also this conflicts with sections F.6.1.3 and F.6.3.1 requiring 1 sample per UDDS, but ok if 1 filter / phase was intended. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

57. Comment: Section F.6.3.5: “Delete subparagraphs (b)(3) through (b)(5).” Comment: Per above suggestions w.r.t. single filter technology, it should allow (b)(5). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

58. Comment: Section F.6.3.6: “Subparagraphs (c) through (c)(2). [No change.]” Comment: (c)(2) allows 4 bag testing which conflicts with F.6.1.3 and F.6.3.1 requiring 1 sample per UDDS, but ok if 1 filter / phase was intended. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

59. Comment: Section F.6.3.11: “Subparagraphs (d) through (d)(1)(iii). [No change.]” Comment: Correct typographical error; “(d)” should be (d)(1)(ii). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

60. Comment: Section F.6.5.2 (1): “Use the following equation for PM measured as described in §1066.815(b)(1) or (2):” Comment: Does not allow single filter. Single filter is an important new technology for the measurement of low levels of PM. Tier 3 allows this measurement technique; LEV III should harmonize with it. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

61. Comment: Section F.7: HWY "To be conducted pursuant to 40 CFR §1066.801." Comment: No roll-out like that provided in Tier 3 §600.111-08 introduction. Industry needs this lead time and flexibility to modify test sites to meet the new LEV III regulations. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the second 15-day modifications.

62. Comment: Section F.8.1.1: "Subparagraphs (a) through (b)(iii)(2)" - Comment: Correct typographical error; should be (b)(2) (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees that a correction should be made to section F.8.1.1; however, (b)(iii)(2) has been replaced with (b)(1) since a change was necessary for (b)(1)(i) as modified in the first 15-day changes.

63. Comment: Section F.8.1.4: "Stop any integrating devices and indicate…" Comment: Correct spelling typographical error from devices to devices. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

64. Comment: Section F.9: SOC calculations. Comment: No allowance is made for alternate SOC criteria like that used in J1711 Appendix C or CO_2 correction. This will become increasingly important as hybrid technology evolves and should be allowed for charge-sustaining testing. If Appendix C is used, should not set the SOC before the emissions test per F.6.2.4. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications. Specifically, Appendix C in SAE J1711 has been included as an end-of-test option for emission testing HEVs. In addition, the words "maximum" and "minimum" have been added to section F.9.2 in reference to maximum and minimum stored capacitor voltage for improved clarity as part of second 15-day modifications.

Comments on Part G

65. Comment: Part G.: Introduction, "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," unless otherwise noted."
Comment: Same concerns as expressed for Subpart F above, over roll-out provisions and requirements branching.

Suggestion: To remediate this roll-out concern, we suggest that in section G. Introduction, the phrase "…unless otherwise noted" be modified to make it clear that the roll out provisions of Part II Subpart A guidance to Part 1066 procedures are still in effect. This is somewhat complex since the hybrid procedures now rely on the Part 1066 test (language) plus instructions with ARB revisions. One solution could be to modify the phrase to "…unless otherwise noted in accordance with the roll-out provisions in Part II, Subpart A."
(Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has removed the text "unless otherwise noted" as a first 15-day modification.

66. Comment: Section G.5: "For vehicles that qualify and are tested on the Alternative Urban Charge-Depleting Emission Test in subsection G.5.4.5, the urban worst case NMOG+NOx 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 require to evaluate the urban worst case NMOG+NOx emissions for charge-depleting, charge-sustaining, charge-increasing operations. If available, each driver-selectable mode must still be considered for worst case NMOG+NOx emissions for the Alternative Urban Charge-Depleting Emission Test."

Comment 1: Conflicting requirements. First sentence says we don't have to test in charge-increasing modes; the second sentence says "…each driver-selectable mode must still be considered for worst case NMOG+NOx emissions…"

Comment 2: Correct typographical error; change "…would not be require…" to "…would not be required…
(Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Commenter is not distinguishing between vehicle operations and driver-selectable modes which are separately addressed in the test procedures. For the Alternative Urban Charge-Depleting Emission Test, this single test would cover the various vehicle operations (e.g., to demonstrate emissions compliance in charge-sustaining, charge-depleting, and charge-increasing operations with a single test instead of separate ones for each vehicle operation). Separately, if a vehicle features driver-selectable modes, then the mode that produces the worst case NMOG+NOx emissions would need to be used during this Alternative Urban Charge-Depleting Emission Test. In both cases, however, a single test can be used to demonstrate emission compliance. In response to comments, several changes were made in the introductory paragraphs of section G to clarify worst case testing for the Urban Charge-Depleting Emission Test, the Urban Charge-Sustaining Emission Test, and the Alternative Urban Charge-Depleting Emission Test. Specifically, emission testing was distinguished from range testing and guidance was provided for testing vehicles with one or more driver-selectable modes. In addition, the typographical error regarding the word "require" was changed to "required," and the word "and" was replaced with the phrase "that can be tested" in regard to testing driver-selectable modes with different vehicle operations. Also, the phrase "of operation" was deleted in reference to driver-selectable modes because modes are not the same as an operation. The word "for" was added to emphasize the vehicles must qualify for the Alternative Urban Charge-Depleting Emission Test. The word "subsection" was changed to "section" to be consistent with the language 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." And finally, the confirmatory testing and in-use compliance protocol for the Urban Charge-Depleting Emission Test and the Alternative Urban Charge-Depleting Emission Test was added. These modifications were part of the first and second 15-day modifications.

67. Comment: Sections G.5.3.2 through G.5.4.2.6: General note on the number of samples per test. Comment: The comments below revolve around some conflicting language in several sections. Specifically how many diluted sample bags and PM filters are needed per test. Some sections say 1 sample per phase; others say 1 sample per UDDS. Suggest clarifying this by allowing diluted bags or PM filter samples per phase, or UDDS. Secondly for PM only, allow 1 PM filter for the entire test (2 UDDS's) using single filter technology (important for harmonization with Tier 3 and for conventional vehicles per leviii14isorappb procedures, Part II, subparts A & C). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff has clarified the number of sample bags and PM filters needed per test in the first 15-day modifications.

68. Comment: Section G.5.3.2 specifies the following PM filter sampling techniques per §1066.815(b):

(b)(1) - 3 or 4 phase FTP with 1 filter/phase. May omit phase 4 filter and substitute phase 2.
Comment: Should limit to traditional 4 phase hybrid testing. Is the intention to allow 1 PM filter per FTP phase (or bag) which is contrary to Subpart F.? Ok if 1 filter / phase was intended.

(b)(2) – 4 phase FTP with 1 filter / UDDS
Comment: Ok if 1 filter / phase was intended.

(b)(5) – Deleted - does not allow single filter PM testing for a 4 phase FTP, flow weighted.
Comment: Four phase single filter sampling should be allowed. This single filter option is an important new technology that should be allowed like that in Tier 3 for harmonization and for conventional vehicles per leviii14isorappb procedures, Part II, Subparts A & C.
In support of option (b)(5) above, it should allow flow weighting per(b)(5), calculate flow weighted PM mass per §1066.605(e)(3) and then calculate composite PM mass per §1066.820(c)(3).

5.3.2 Also requires G.5.6 which is the traditional filter composite equation.
Comment: In support of (b)(5) above should allow §1066.820(c)(3). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly. In addition, “charge-sustaining” was deleted as a type of composite PM emissions since this description is not necessary, and language missing from §1066.815(b) was added. These modifications were part of the first 15-day changes.

69. Comment: Section G.5.3.3: “Amend subparagraphs (b)(1): You may collect a separate PM sample for transient and stabilized portions of the cold-start UDDS and the hot-start UDDS. This may be done by sampling with four bags.”
Comments: Correct spelling typographical error, change “stabilized” to “stabilized. “ Assume this is intended to require traditional 4 phase testing for hybrids. (Post script, the wording “bag” is not appropriate since this is clearly intended for PM filters by “phase”).
Again as in G.5.3.2, is the intention to allow 1 PM filter per FTP phase (or bag)? G.5.3.5: “Delete subparagraphs (b)(3) through (b)(5).”
Comment: Per above suggestions with respect to single filter technology, it should allow (b)(5).

(Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

70. Comment: Section G.5.3.6: "Subparagraphs (c) through (c)(2). [No change.]" Comment: (c)(2) allows 4 bag testing. Is this the intention? 1 bag / FTP phase. Ok if 1 filter / phase was intended. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

71. Comment: G.5.4.2.2 specifies the following PM filter sampling techniques per §1066.815(b): (b)(1) - 3 or 4 phase FTP with 1 filter/phase. May omit phase 4 filter and substitute phase 2.

    Comment: Should limit to traditional 4 phase hybrid testing. Is the intention to allow 1 PM filter per FTP phase (or bag), which is contrary to subpart F? Ok if 1 filter / phase was intended (b)(5) . Does not allow single filter PM testing for a 4 phase FTP, flow weighted.

    Comment: Single filter sampling should be allowed. This single filter option is an important new technology that should be allowed for harmonization with in Tier 3 and for conventional vehicles per leviii14isorappb procedures, Part II, Subparts A & C.
    In support of option (b)(5) above, it should allow flow weighting per(b)(5), calculate flow weighted PM mass per §1066.605(e)(3), then calculate composite PM mass per §1066.820(c)(3).

    G.5.4.2.2 also requires G.5.6 which is the traditional filter composite equations.
    Comment: In support of (b)(5) above should allow §1066.820(c)(3). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

72. Comment: Section G.5.4.2.3: "Amend subparagraphs (b)(1): You may collect a separate PM sample for transient and stabilized portions of the cold-start UDDS and the hot-start UDDS. This may be done by sampling with four bags."
    Comments: Correct spelling typographical error, "stabilized." Assume this is intended to require traditional 4 phase testing for hybrids. (Post

script, the wording “bag” is not appropriate since this is clearly intended for PM filters by “phase”).
(Again) as in G.5.4.2.2, is the intention to allow 1 PM filter per FTP phase (or bag), which is contrary to subpart F but ok if 1 filter / phase was intended. G.5.4.2.5: “Delete subparagraphs (b)(3) through (b)(5).” Comment: Per above suggestions with respect to single filter technology, should allow (b)(5).
(Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

73. Comment: Section G.5.4.2.6: “Subparagraphs (c) through (c)(2). [No change.]” Comment: (c)(2) allows 4 bag testing, but ok if 1 filter / phase was intended. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

74. Comment: Section G.5.4.3: “Additional End-of-Test Criteria. If the SOC Net Energy Change Tolerance is not satisfied after the hot-start test in section G.5.4.2.17, then the End-of-Test criterion pursuant to 40 CFR §1066.501 may be used with the following revisions:” Comment: Provisions in G.5.4.3.2 should be applicable to CS & CD testing, but G.5.4.2.17 limits this section to CD only. SAE’s J1711 section 3.9.1 was intended for CD testing, and Appendix C for CS testing. Suggest parsing these requirements out by test type. Also the number 5.4.3 should be changed to reflect it is applicable to CS (5.3) and CD 5.4) testing. 5.4.3 is currently under CD section only. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

75. Comment: Section G.5.4.3.3: “Appendix C of SAE J1711 (June 2010) may be used to correct CO_2 emissions, and carbon-related exhaust emissions, but may not be used to correct measured values for criteria pollutant emissions. Comment: CO_2 corrections are really applicable to CS testing, but this subsection is for CD only. See parsing comments in G.5.4.3 above. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

76. Comment: Section G.5.4.5: "…and has an AER/EAER ratio that is equal to or greater than 0.98…" Comment: This is too tight a tolerance to establish today given the rapidly evolving hybrid technology. Recommend 0.90. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: The Alternative Urban Charge-Depleting Emission Test in Section G.5.4.5,, was specifically developed for those PHEVs with long all-electric range (AER) and minimal to no engine assistance ("blended operation") during urban charge-depleting operation. By design, PHEVs meeting this criteria will have a very limited opportunity in-use for engine operation during charge-depleting operation—both by having a longer range that reduces the number of trips where the engine will turn on and by effectively not turning the engine on until the vehicle is ready to transition to charge-sustaining operation.. Given this, staff felt it was unnecessary to require vehicle manufacturers to expend significant extra test time and resources to attempt to capture and verify emissions in this very narrow window of operation that is expected to occur infrequently in-use. Instead, staff focused the testing on verifying emissions when the engine starts as the vehicle transitions to charge-sustaining operation—an event that is expected to happen with much more routine frequency in-use. By testing several PHEVs at ARB's emission testing laboratory, staff found that one blended PHEV had a significant window of opportunity for engine operation during charge-depleting operation yet was nearly able to achieve a 0.97 AER/EAER ratio. This vehicle also demonstrated multiple distinct engine start and run events during charge-depleting operation, increasing the risk of higher emissions during in-use operation if the emission controls are not fully functional. Consequently, the criterion of 0.98 was selected to ensure such designs would be subjected to additional scrutiny during emission testing. No modifications were made in response to this comment.

77. Comment: Section G.5.4.5(vii): "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." Comment: Delete section G.5.4.5 (vii) as there is no need to recharge the battery in order to calculate EAEREC per G.11.7. If needed this would be calculated using the CD emissions procedures of G.5.4.2. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees but did not delete section G.5.4.5(vii) to address the issue. Instead, staff modified the test procedures to allow vehicle charging in section G.5.4.5(vii) to be optional with added language for improved clarity. These changes were made in the second 15-day modifications.

78. Comment: Section G.5.5.1.2: "n = hot-start UDDS cycle"

Comment: Correct typographical error; it should be cycle(s) since there can be more than 1.

How many hot start UDDS cycles are allowed for CD testing? Assuming this is limited to either G.10 ±1% of SOC criteria or G.5.4.3.2 SAE J1711 section 3.9.1, then for a vehicle which achieves CS within 2 UDDS's (1 cold & 1 hot), this criteria could cause a double cold start phenomena which would unfairly penalize a vehicle with low trip emissions (including AER zero emissions modes).

In previous versions of these CD procedures, "n" was optionally allowed to be 2 to help alleviate the double cold start concern as follows:

> "If there are no charge-depleting hot start cycles, then use the next hot start cycle (after the cold start cycle) in the test sequence for the purpose of determining hot start emissions. For this case (no charge-depleting hot start cycle), the manufacturer may optionally add one additional hot start cycle for an n=2."

However this provision was intended for vehicles that achieve charge-sustaining operation with only 1 hot start cycle, and does not address the new LEV III charge-increasing option of G.5.4.2.17, nor the allowance for J1711 appendix C where again only 1 hot start cycle may (or would) occur. To this end, we suggest the definition of n be modified as follows:

> "n = # of hot-start UDDS cycle(s). The manufacturer may optionally add one additional hot start cycle for a minimum of n=2 for the purposes of determining emissions. ARB will do the same for their testing."

As an alternative, J1711 CD utility factor equations could be used for CD testing. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications. Specifically, "n = hot-start UDDS cycle" has been deleted since the number of hot-start UDDS cycles varies and is governed by the end-of-test options that a manufacturer may choose. However, regarding the comment suggesting that J1711 CD utility factor equations be used as an alternative, staff does not agree this is equivalent and the test procedures were not modified to allow such an alternative.

79. Comment: Section G.5.6.1.2: "n = hot-start UDDS cycle" Comment: Same as section G.5.5.1.2 with respect to "n". (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications. Specifically, "n = hot-start UDDS cycle" has been deleted since the number of hot-start UDDS cycles varies and is governed by the end-of-test options that a manufacturer may choose.

80. Comment: Section G.6: HWY introduction "For the purpose of demonstrating compliance with exhaust emission standards, a vehicle must be tested in the vehicle operation (i.e., either charge-depleting, charge-sustaining, or charge-increasing operation) that represents the worst case highway NMOG+NOx emissions of the engine." Comment: This requirement brings in a new regulatory requirement to run a cold start, CD HWY test which was not in the previously published hybrid test procedures, conflicts with G.6.1.1, G.6.1.2, and G.6.1.3, and is not harmonized with Tier 3 emissions regulations. HWY's have always been a hot start test. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications with additional modifications done as part of the second 15-day changes. Specifically, all references to charge-depleting highway emission tests have been deleted. Furthermore, the title "Highway Charge-Sustaining Emission Test" has been changed to "Highway Emission Test" since there is no charge-depleting highway emission test. Finally, the phrase "of operation" was deleted in reference to driver-selectable modes because modes are not the same as an operation.

81. Comment: Section G.6: "…and vehicle operation (i.e., charge-depleting, charge-sustaining, charge-increasing) which represents the worst case **urban** NMOG+NOx emissions of the engine. For example, if a vehicle has two driver-selectable modes and charge-depleting, charge-sustaining, and charge-increasing operations, the manufacturer shall determine worst case **urban** emissions of NMOG+NOx by comparing…" Comment: Correct typographical error; it should be "highway". (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

82. Comment: Section G.6.1.4.2: HWY testing, "F.9" Comment: Correct typographical error; it should be G.10. (Steven Douglas, Senior

Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

83. Comment: Section G.6.1.5 HWY testing, "Additional End-of-Test Criteria. If the SOC Net Energy Change Tolerance is not satisfied after the hot-start test in section G.6.4.1.2, then the End-of-Test criterion pursuant to 40 CFR §1066.501 may be used with the following revisions:" Comment: Correct typographical error; "G.6.4.1.2" should be 6.1.4.2. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

84. Comment: Section G.6.1.5: Should also be applicable to CS & CD testing, but G.6.1.4.2 limits this section to CS only. Comment: Suggest modifying to "…G.6.1.2 for CD testing or G.6.1.4.2 for CS testing…" (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Since staff deleted charge-depleting operation from the Highway Emission Test requirements in the first 15-day modifications, the issue raised by this comment is no longer relevant. The Highway Emission Test is strictly a charge-sustaining test, therefore, no changes to any charge-depleting requirement are necessary. As such, no modifications were made in response to this comment

85. Comment: Section G.7: "and vehicle operation (i.e., charge-depleting, charge-sustaining, charge-increasing) which represents the worst case urban NMOG+NOx emissions of the engine. For example, if a vehicle has two driver-selectable modes and charge-depleting, charge-sustaining, and charge-increasing operations, the manufacturer shall determine worst case urban emissions of NMOG+NOx by comparing…" Comment: Correct typographical error; it should be "SFTP". (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

86. Comment: Section G.7.1.4: US06 testing, "A valid test shall satisfy the SOC Net Energy Change Tolerances in section G.10 for the US06 cycle with emission sampling." Comment: No allowance for J1711

Appendix C, similar to that given for UDDS (G.5.4.3) or HWY (G.6.1.5). US06 should have the same provisions as UDDS or HWY, but limited to CS operation. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

87. Comment: Section G.7.2.4: SC03 testing, "A valid test shall satisfy the SOC Net Energy Change Tolerances in section G.10 for the SC03 cycle with emission sampling." Comment: No allowance for J1711 Appendix C, similar to that given for UDDS (G.5.4.3) or HWY (G.6.1.5). SC03 should have the same provisions as UDDS or HWY, but limited to CS operation. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

88. Comment: Section G.8.1 "To satisfy test requirements for the 50°F emission test, the vehicle shall be tested in the worst case (for NMOG+NOx emissions) of the urban charge depleting range emission test or urban charge sustaining emission test as defined in section G.5. To satisfy test requirements for the 20°F emission test, the vehicle shall be tested in the worst case (for CO emissions) of the urban charge-depleting emission test or urban charge-sustaining emission test as defined in section G.5." Comment: Two different criteria, NMOG+NOx for 50°F testing and CO for 20°F testing. This should be consistent with G.5 as NMOG+NOx. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: The use of two different criteria was intentional and is required because the emission standard for the 50°F test is based on NMOG and NOx emissions; whereas, the emission standard for 20°F test is based on CO emissions. It would be inappropriate to test for compliance with a CO standard by operating the vehicle in a worst case mode for any pollutant other than CO. No modifications were made in response to this comment.

89. Comment: Section G.5.6.1.2 (1): "Use the following equation for PM measured as described in §1066.815(b)(1) or (2)." Comment: Does not allow single filter. Single filter is an important new technology for the measurement of low levels of PM. Tier 3 allows this measurement technique, and LEV III should harmonize with it. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

Comments Concerning Conflicting Charge-Increasing Mode Requirements

90. Comment: Section G.5: "For the purpose of demonstrating compliance with exhaust emission standards, a vehicle must be tested in the vehicle operation (i.e., charge-depleting, charge-sustaining, or charge-increasing operation) that represents the worst case NMOG+NOx emissions of the engine."

"Vehicles with more than one driver-selectable mode (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, or charge-sustaining, or charge-increasing operation must be 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 of the engine."

Comment: Above implies for a full charge test, we must select a driver selectable battery charging mode if that is worst case. But B.1 requires "lowest normal level" SOC, but the battery is at full charge? (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications. Specifically, certain driver-selectable modes are not compatible with certain vehicle operations and could not be tested, and therefore, would not be required for emissions testing. For example, a driver-selectable charge-increasing mode would not be required to be tested with a charge-depleting vehicle operation.

91. Comment: Section G.5.2.1: "The vehicle shall be preconditioned in the driver-selectable mode to be tested and in charge-sustaining operation." Comment: Non-executable. Charge-increasing mode selected and vehicle will be at a higher SOC at the end of the prep which conflicts with B.1 "lowest normal level", so will need to set SOC. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications. Specifically, vehicle preconditioning shall be performed with the vehicle in default mode or in normal mode if the vehicle does not have a default mode. In addition, the Highway Charge Depleting Range Test and the optional

Cold Start US06 Range Test were deleted from section G.5.2.8 since this section is for urban vehicle preconditioning and was modified as part of the second 15-day changes.

92. Comment: Section G.5.2.5: "For the charge-depleting range emission test and the charge-sustaining emission test, the preconditioning cycle shall be the UDDS cycle. The vehicle must be in charge-sustaining operation during the preconditioning drive." Comment: Non-executable, charge-increasing mode selected per G.5.2.1. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

93. Comment: Section G.5.3.10: Amend subparagraph (d)(1)(i): "Precondition the vehicle as described in section G.5.2. Initiate the charge-sustaining cold-start test following the 12 to 36 hour soak period." Comment: Non-executable, charge-increasing mode selected. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications. Specifically, guidance was provided on how to test driver-selectable modes. Additional second 15-day modifications included inserting "(d)" that was inadvertently left out as a reference in sections G.5.3.13 through G.5.3.17, and how to validate a test through end-of-test conditions in G.5.3.17. First 15-day modifications included clarifying modifications made to section G.5.3. The 45-day notice version of G.5.3 used the word "test" to refer to both a UDDS cycle and a full Urban Charge-Sustaining Emission Test. The revised language replaced the word "test" with "UDDS cycle" or "Urban Charge-Sustaining Emission Test," as applicable.

94. Comment: Section G.5.4.2.10: Amend subparagraph (d)(1)(i): "Precondition the vehicle as described in section G.5.2. Initiate the charge-sustaining cold-start test following the 12 to 36 hour soak period." Comment: G.5.2 requires the charge-increasing button be selected at the preconditioning cycle, but after the preconditioning cycle B.1 requires the SOC to be set to the lowest normal SOC, yet G.5.2.8 requires the SOC to be fully charged for the subsequent CD test? (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly. Specifically, the requirement to set the SOC to the lowest normal level was deleted. In addition, the language was modified

throughout section G.5.4 to make corrections and improve clarity. The word “subparagraph” was replaced with “section” for consistency. Instructions to record the SOC when the engine first starts were added. The test cycle to be used was identified as the UDDS. Guidance on how to test driver-selectable modes and mitigate an end-of-cycle start was included. In addition, as with G.5.3, the 45-day notice version of G.5.4 also used the word “test” to refer to both a UDDS cycle and a full Urban Charge-Sustaining Emission Test. The revised language replaced the word “test” with “UDDS cycle” or “Urban Charge-Sustaining Emission Test,” as applicable. The letter “(d)” that was missing from several CFR subparagraph references was added. The end-of-test conditions for validating a test were clarified. These modifications were part of the first and second 15-day changes.

95. Comment: Section G.5.4.2.17: “A valid test shall satisfy the SOC Net Energy Change Tolerances in section G.10. An option is allowed for PHEVs with charge-increasing operation where a test may be considered valid if the SOC at the end of the hot-start test is higher than the SOC at the beginning of the cold-start test. If this option is used, then confirmatory and in-use compliance tests shall also be considered valid if the SOC at the end of the hot-start test is higher than the SOC at the beginning of the cold-start test.” Comment: If during a CD test the charge-increasing button selected, the batteries won’t deplete, the vehicle will just keep running UDDS cycles till the vehicles runs out of gas, and then the vehicle will start depleting the battery. This test sequence --run endless UDDS’s till the vehicle runs out of gas, then depleting the fully charged battery energy -- is dramatically longer than a conventional CD test and doesn’t make sense. Also can’t meet SOC after battery is depleted because the vehicle is out of gas, hence can’t start the engine. Very burdensome. Also in theory one could achieve the SOC criteria w/o depleting the battery, which defeats the purpose of running a CD test to determine AER and EAER. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications. Only appropriate modes shall be tested for a CD test, i.e., a driver-selectable charge-increasing mode would be inappropriate or not compatible with a CD test.

96. Comment: Section G.5.4.5: “A vehicle with an 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 section G.5.4.2.”
    Comment: It is unclear how one qualifies for this Alternative CD UDDS test sequence, given the previous language in G.5 on charge-increasing modes, specifically to meet this four UDDS AER range and the AER/EAER ratio. Qualifying for this alternative test requires:

(1) A CD UDDS emissions test sequence per G.5.4.1 and G.5.4.2. But this CD emissions test is subject to G.5 which states “Vehicles with more than one driver-selectable mode (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, or charge-sustaining, or charge-increasing operation must be 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 of the engine”. This would imply the CD test would need to be run in charge-increasing mode.
(2) If run in CI mode, the AER distance would be reduced along with the AER/EAER ratio
(3) Therefor it is likely the vehicle would not qualify for this Alternate CD test sequence. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has clarified the requirements of the Alternative Urban Emission Test by requiring that the PHEV be operated in default more (or in normal mode if the vehicle does not have default mode) to determine urban all-electric range (AER). In addition to adding guidance for the urban AER, language was modified to further clarify how SOC must be set with regard to driver-selectable modes and reiterating that the engine must start at or before the first 45 seconds of the cold-start UDDS cycle to be a valid test. These modifications were part of the first and second 15-day changes.

97. Comment: Section G.5.4.5 (iii): “The vehicle shall be preconditioned according to section G.5.2.” Comment: Requires prep cycle to be run in charge-increasing mode with subsequently higher SOC, which conflicts with G.5.2 that requires the prep cycle to be “charge-sustaining.” (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

    Agency Response: Staff agrees and has modified the test procedures accordingly in the second 15-day modifications. Specifically, vehicle preconditioning in section G.5.2 is performed with the vehicle in default mode or normal mode if the vehicle does not have default mode.

98. Comment: Section G.6.1.4 says: “The Highway Charge-Sustaining Emission Test is conducted after charge-sustaining operation has been reached.” Section G.6.1.4.1 says: “Perform the Highway Charge-Sustaining Emission Test…If available, the driver-selectable mode to be tested shall be activated during the preconditioning drive.” Comment: Sections G.6.1.4 and G.6.1.4.1 conflict since G.6.1.4.1 will be in charge-increasing mode. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly. Specifically, "Charge-Sustaining" has been deleted from the section title "Highway Charge Sustaining Emission Test" and now reads, "Highway Emission Test." In addition, revisions clarify that no driver-selectable mode is to be activated for the preconditioning drive, which is to be performed in charge-sustaining operation. The basis for additional preconditioning was changed from "unusual circumstances" to a need demonstrated by the manufacturer. Furthermore, the language was modified throughout section G.6 to make corrections and improve clarity. Specifically, emission testing was distinguished from range testing and guidance was provided for testing vehicles with one or more driver-selectable modes. The phrase "of operation" was deleted in reference to driver-selectable modes because modes are not the same as an operation. The end-of-test conditions for validating a test were clarified. And finally, the specific cycle that would be used for the emission test was changed from the "hot-start test" to the "HFEDS cycle with emission sampling." These modifications were part of the first and second 15-day changes.

99. Comment: Section G.6.1.4.2: "Operate the vehicle over the HFEDS cycle for preconditioning. 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." Comment: After running the HWY prep in a charge-increasing mode, B-1 Definitions of "Charge-increasing operation" requires setting the SOC "lowest normal level", but we just ran a prep which set the SOC at a higher level. So in the 15 seconds between the HWY prep and the HWY emissions test, the vehicles SOC would have to be artificially reduced to this lowest normal level. How does one decrease a high voltage battery charge, in 15 seconds, while the engine is running and simultaneously trying to increase the battery charge, and also not interfere with the vehicle cooling fan which is operating? This is not feasible, and even if possible would absolutely not be representative of normal vehicle operation and would adversely impact the vehicles control systems right before an official emissions test, due to a sudden battery drain while at idle vehicle the vehicle is trying to maintain a charge-increasing mode. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications. Specifically, the HFEDS cycle for preconditioning is to be performed with the vehicle in default mode or normal mode if the vehicle does not have default mode.

100. Comment: Section G.7 introduction: "Vehicles with more than one driver-selectable mode (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 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 of the engine." Section G.7.1 says: "This section G.7.1 shall apply during charge-sustaining operation." Section G.7.1.2 says: "If available, the driver-selectable mode to be tested shall be activated during the preconditioning drive." Comment: Sections G.7.1 and G.7.1.2 conflict when charge-increasing mode is selected. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications. Specifically, the charge-sustaining operation requirement in section G.7.1 and the requirement to activate the driver-selectable mode to be tested during the preconditioning drive in section G.7.1.2 have been deleted. In addition, the language was modified throughout section G.7 to make corrections and improve clarity. Guidance was provided for worst case testing of vehicles with one or more driver-selectable modes and for vehicle preconditioning. The requirement to emission test in charge-depleting vehicle operation was removed since SFTP tests are performed with the engine in a warmed-up condition. Testing was clearly identified as emission testing as opposed to a range testing. The phrase "of operation" was deleted in reference to driver-selectable modes because modes are not the same as an operation. For the US06 Emission Test, the language that amended §1066.831 was corrected since the amendments were incomplete. Similarly, for the SC03 Emission Test, the language that amended §1066.835 was corrected since the amendments were incomplete. Finally, the end-of-test conditions for validating a test were clarified. These modifications were part of the first and second 15-day changes.

101. Comment: Section G.7.1.3: Requires §1066.831(b)(4), the 1–2 minute idle between the US06 preconditioning cycle and the US06 emissions test. Comment: After running the US06 prep in a charge-increasing mode, B-1 Definitions of "Charge-increasing operation" requires setting the SOC "lowest normal level", but we just ran a prep which set the SOC at a higher level. In the 1 - 2 minutes between the US06 prep and the US06 emissions test, the vehicles SOC would have to be artificially reduced to this lowest normal level. How does one decrease a high voltage battery charge, in 1 – 2 minutes, while the engine is running and simultaneously trying to increase the battery charge, and also not interfere with the vehicle cooling fan which is operating? This is not feasible, and even if possible would absolutely not be representative of normal vehicle operation and would adversely impact the vehicles control systems right before an official emissions test, due to a sudden battery drain while at idle vehicle the vehicle is trying to maintain a charge-increasing mode. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

102. Comment: Section G.7.2 says: "The vehicle shall be preconditioned in the driver-selected operating mode in which it will be tested and at a charge-sustaining SOC level." Section G.7.2.2 says: "If available, the driver-selectable mode to be tested shall be activated during the preconditioning drive." Comment: Section G.7.2 charge-sustaining preconditioning conflicts with section G.7.2.2 when charge-increasing mode is selected. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications. Specifically, the charge-sustaining requirement in section G.7.2 and the requirement to activate the driver-selectable mode to be tested during the preconditioning drive in section G.7.2.2 have been deleted.

103. Comment: Section G.7.2.3: Requires §1066.835(c)(6), the 9 to 11 minute hot soak between the SC03 preconditioning cycle and the SC03 emissions test. Comment: After running the SC03 prep in a charge-increasing mode, B-1 Definitions of "Charge-increasing operation" requires setting the SOC "lowest normal level", but we just ran a prep which set the SOC at a higher level. So in the 9 - 11 hot soak minutes between the SC03 prep and the SC03 emissions test, the vehicles SOC would have to be artificially reduced to this lowest normal level. How does one decrease a high voltage battery charge, in 9 - 11 minutes, while the hood is closed, and also not interfere with the vehicle cooling fan which is operating? This is not feasible, and even if possible would absolutely not be representative of normal vehicle operation and would adversely impact the vehicles control systems right before an official emissions test, due to a sudden battery drain while at idle vehicle the vehicle is trying to maintain a charge-increasing mode. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the first 15-day modifications.

104. Comment: Section G.8: "50^{o}F testing shall be conducted pursuant to section G.5 …" and "20^{o}F testing shall be conducted pursuant to section G.5 …" Comment: Section G.5 brings in charge-increasing modes to 20 and 50^{o}F testing. This create multiple conflicts for section G.8 for both charge-sustaining and charge-depleting cold testing just like that detailed for 75^{o}F testing per section G.5 above. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile

Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff has modified section G.5 in the first 15-day modifications to address conflicts that also addresses conflicts in section G.8 regarding 20°F and 50°F emission testing.

105. Comment: Section G.8.1: "To satisfy test requirements for the 50°F emission test, the vehicle shall be tested in the worst case (NMOG+NOx) of the urban charge-depleting emission test or urban charge-sustaining emission test as defined in section G.5. To satisfy test requirements for the 20°F emission test, the vehicle shall be tested in the worst case (CO) of the urban charge-depleting emission test or urban charge-sustaining emission test as defined in section G.5. For the 20°F and 50°F emission tests, the vehicle is not required to meet SOC net tolerances." Comment: Multiple conflicts. What does one do if the worst case NMOG+NOx for 75°F UDDS "charge-sustaining" (which it isn't) is with charge-increasing mode selected? Likewise for charge-depleting 75°F UDDS tests and 20°F CO worst case testing. What if the 75°F UDDS charge-sustaining NMOG+NOx is the worst case (w/o the charge-increasing mode selected), does the reference to section G.5 require OEMs to run the vehicle in charge-increasing and charge-decreasing at cold temperatures? Likewise for charge-depleting 75°F UDDS tests and 20°F CO worst case testing. This is directly conflicting with section G.8.1. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: A charge-sustaining test with a driver-selectable charge-increasing mode activated describes the initial state of vehicle operation when a charge-increasing mode is activated at the beginning of a charge-sustaining test. This simulates a situation that PHEVs could experience during on-road operation. If the worst case NMOG+NOx for 75°F testing (or section G.5, urban emission testing) was determined to be a charge-sustaining test with a driver-selectable charge-increasing mode activated, then the only 50°F emission test required for certification would be the same charge-sustaining test with a driver-selectable charge-increasing mode activated. The differences would be that the ambient test conditions would be 50°F instead of 75°F, the traditional 3-phase FTP would be performed as opposed to the 4-phase FTP (or 2 UDDS cycles), and no SOC Criterion (NEC Tolerances) validation for the test. Likewise, if the charge-depleting test generated the worst case emissions for the 75°F test, then only a charge-depleting 50°F test would be required for certification. The 20°F emission test would require a manufacturer to determine which vehicle operation and driver-selectable mode combination would result in worst case CO emissions at 20°F following the procedure outlined for 75°F testing (or section G.5, urban emission testing). Staff modified section G.8.1 to improve clarity of the procedures in the first 15-day modifications.

8. Comments In Support of the Amendments

106. Comment: Overall, DEP strongly supports the proposed revisions because the revisions continue the effort to harmonize the LEV III regulations with the Tier 3 regulations to the extent that harmonization supports the most stringent emission standards and testing requirements. Most of the revisions are corrections to references to the Code of Federal Regulations, formatting and structural revisions, and clarification of the applicability of various sections and test procedures. Additionally, there are several revisions incorporating standards from Tier 3 that were more stringent than LEV III, and adding some new compliance options for manufacturers to increase compliance flexibility. CARB also kept provisions from LEV III that are more stringent than Tier 3 requirements. (Dana K. Aunkst, Acting Secretary, Pennsylvania Department of Environmental Protection (DEP))

Agency Response: We appreciate this comment, for which no response is needed because it supports the staff proposal.

107. Comment: MECA is pleased to provide written comments in support of the Air Resources Board's proposed amendments to the LEV III standards for light- and medium-duty vehicles, and the test procedures for heavy-duty engines and vehicles. These proposals, when finalized, will more completely align ARB's LEV III requirements with EPA's Tier 3 light-duty and medium-duty criteria pollutant emissions standards. This alignment will essentially create for the first time a single, national set of exhaust and evaporative emission standards for light- and medium-duty vehicles. LEV III and Tier 3 vehicle criteria pollutant standards reset the bar for state-of-the-art exhaust and evaporative emission controls for light-duty vehicles through 2025, and provide significant public health benefits to the citizens of California and the rest of the U.S. MECA applauds ARB and EPA for developing a largely unified LEV III/Tier 3 national program that is aligned in time with the light-duty vehicle fuel efficiency/greenhouse gas emission requirements. MECA strongly supports ARB's proposed LEV III actions that harmonize most of the remaining differences with EPA's final Tier 3 regulation, but also leave in place a few remaining important differences between these programs…. The most significant of the remaining differences is ARB's 1 mg/mile FTP PM standard that currently starts implementation with model year 2025. MECA strongly supported and agreed with ARB's decision to include a 1 mg/mile particle matter standard for light-duty vehicles over the FTP test cycle in their LEV III requirements. (Joseph Kubsh, Executive Director, Manufacturers of Emission Controls Association (MECA))

Agency Response: We appreciate this comment, for which no response is needed because it supports the staff proposal.

108. Comment: On behalf of the American Lung Association in California and the Center for Energy Efficiency and Renewable Technologies (CEERT), we are writing to express our support for the proposed modifications to the California's Low-Emission Vehicle (LEV III) Standards for criteria air pollutants. We support the revisions to the LEV III program because they maintain California's commitment to improving public health and air quality by requiring significant reductions in the emissions of smog and particle pollution from the state's passenger vehicles. Due to the serious health dangers of particle pollution we remain especially supportive of California's leadership with the LEV III program's stronger particle pollution standard. This proposal follows through on California's commitment to align state and federal vehicle programs while preserving California's stronger vehicle emission standards and the faster phase-in requirements needed to address our unique and severe air quality challenges…. Specifically we support: California's Retention and Extension of LEV III benefits; Maintaining the particulate matter standard of 1 mg/mile in the LEV III standards; and Maintaining credit banking provision for 5 years. (Bonnie Holmes-Gen, Senior Director, Policy and Advocacy American Lung Association in California and John Shears, Research Coordinator, The Center for Energy Efficiency and Renewable Technologies)

Agency Response: We appreciate this comment, for which no response is needed because it supports the staff proposal.

109. Comment: I'm here to support the staff's recommendation. They've done a very thoughtful and thorough job on this item. I do want to underscore as part of their recommendation they are not recommending extension of the credit life. We concur with that absolutely. No changes at this time. (Barry Wallerstein, Executive Officer, South Coast Air Quality Management District)

Agency Response: We appreciate this comment, for which no response is needed because it supports the staff proposal.

110. Comment: The LEV III and Tier 3 regulations contain two options for complying with the PM phase-in – the Standard Path with fixed phase in percentages and an Alternative Path allowing the manufacturer to use points. Under the LEV III regulations, the Standard path is a fixed percentage based on actual sales, while the Alternative Path is variable based on projected sales. EPA's regulations are exactly the opposite – projected sales for the Standard Path and actual sales for the Alternative Path. This creates a conflict between the two regulations. ARB staff reported that they could not make changes to the Standard Path in this rulemaking. Rather than aligning with EPA on the Alternative Path but remaining unaligned on the Standard path, we would prefer to maintain the current regulation. Consequently, we do NOT recommend any changes at this time. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile

Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: We appreciate this comment, for which no response is needed because it supports the staff proposal.

9. Comments Outside the Scope of this Rulemaking

111. Comment: Please stop the Unreasonable, Untrustworthy and UNNEEDED Targets the present Regs. and these Proposed Regs. do and will plague the Economy. The major Betrayal of this Board towards those Manufacturers and the Truckers who purchased Big RIGS that were built to the Boards Specs and Board Guaranteed Ca. entry approval. A promise the Board did not honor. Due to this Boards Dishonesty! Now thousands of these Trucks cannot enter CA. and are turned away. Many now sit in Storage! NO NEW REGS> NEEDED! OLD REGS need to be REVOKED! (William McCarthy)

Agency Response: This comment concerns the purchase of big rig trucks and falls outside the scope of this rulemaking. Therefore, no response is required.

112. Comment: Chrysler Group LLC ("Chrysler") appreciates the opportunity to provide comments on the amendments proposed by the California Air Resources Board ("ARB") to the LEV III rules. Chrysler's comments that follow concern ARB's proposal to retain the 5-year credit life for NMOG+NOx credits, rather than extending the credit life to eight years to harmonize California's LEV III rules with the federal Tier 3 rules promulgated by the U.S. Environmental Protection Agency ("EPA"). California should harmonize its credit life strategy with the EPA Tier 3 approach to best serve ARB's goal of early actions to optimize air quality benefits. Also—as currently structured—ARB's LEV III rules raise a legal concern regarding compliance with Clean Air Act requirements for lead time and stability for vehicles above 6,000 pounds GVWR, and, that resolving the policy concerns underlying lead time and stability (by harmonizing with the Tier 3 credit life for all vehicles) would best address this legal concern. Specifically, the proposed amendments to the LEV III rules violate section 7521(a)(3)(C) of title 42 of the United States Code (Clean Air Act (CAA) § 202(a)(3)(C), requiring 4 years of lead time for heavy duty vehicles), in that they impose strict standards that decline continuously on an annual basis. Such annually-declining standards plainly violate the CAA's three-year stability requirement with respect to vehicles in excess of 6,000 pounds GVWR. This issue is grounds for EPA to deny a waiver under CAA. FCA would be satisfied that ARB adequately addressed these lead time and stability concerns if ARB were to adopt an 8-year credit life approach. (Vaughn Burns, Head – Vehicle Emissions, Certification and Compliance, Fiat Chrysler Automobiles (FCA))

Agency Response: FCA's proposed extension of credit life to 8 years cannot be done in this rulemaking as it would be outside the scope of the rulemaking (see Staff's Initial Statement of Reasons, pp. 27-29).

However, for purposes of responding to this comment, ARB disagrees with the commenter that the proposed LEV III amendments are subject to the lead-time and stability provisions of section 202(a)(3) of the federal CAA. That section only applies to standards "promulgated or revised under this paragraph [section 202(a) of the CAA]," that is, to standards promulgated by the Administrator of the U.S. EPA. ARB adopted the LEV III amendments pursuant to the authority of California state law and the waiver provisions of section 209(b) of the CAA, and consequently the cited lead-time and stability requirements are simply inapplicable. This position on authority is well-established and ARB has relied on it in past waiver requests to EPA that have been granted.

FCA's assertion that EPA would deny a waiver for the LEV III rule amendments under CAA section 209(b)(1)(C) because the amendments do not incorporate the lead time and stability standards of CAA section 202(a)(3)(C) is incorrect. Under CAA section 209(b)(1)(C) EPA must not grant a waiver if the Administrator finds that the State standards and accompanying enforcement procedures not "consistent" with CAA section 202(a). FCA argues that the proposed amendments do not mirror the lead time and stability requirements of CAA section 202(a)(3)(C) and so are not "consistent." This argument is not supported by applicable case law. In *Motor & Equip. Mfrs. Ass'n v. Nichols* (1998) 142 F.3d 449, the U.S. Court of Appeals addressed the meaning of "consistent" in the context of section 209(b)(1)(C) and found that language does not require consistency with each individual federal requirement in section 202(a).

> [S]ection 209(b)(1) makes clear that section 202(a) does not require, through its cross-referencing [of section 202(a)], consistency with each federal requirement in the act. California's consistency is to be evaluated " in the aggregate," rather than on a one-to-one basis. (*Ibid*. at pp. 463-64.)
>
> Requiring California to meet the standards of each subsection of section 202 would eviscerate much of the flexibility of the waiver program, in contravention of Congress' purpose in creating it, as EPA's traditional interpretation and decisions by this court have recognized. (*Ibid*. at p. 464.)

Based on *Motor & Equip. Mfrs. Ass'n v. Nichols*, the proposed LEV III rule amendments are eligible for a waiver under CAA section 209(b).

Additionally, Since 1970, EPA has typically applied a "2-pronged" test of whether California standards are consistent with CAA section 202(a)

as required by section 209(b)(1)(C). The standards must be: (1) technologically feasible in the lead time provided considering the cost of compliance, and (2) compatible with the federal test procedures so that a single vehicle could be subjected to both tests. No more should be required. This test is in accord with the legislative history of section 209. When the California waiver provisions and the "consistent with section 202(a)" language were first placed in the CAA in 1965, section 202(a) consisted of just one sentence requiring adequate lead time in consideration of technological feasibility and economic costs. In the 1977 CAA amendments, Congress amended section 209 "to afford California the broadest possible discretion in selecting the best means to protect the health of its citizens and the public welfare." (H. R. Rep. No. 294, 95th Cong., 1st Sess. 30 (1977), reprinted in 4 Leg. Hist. at 2768.) At the same time, Congress expanded section 202(a) to add several directives to U.S. EPA regarding its adoption of emission standards, including the 4-year lead time requirement for heavy-duty vehicles. Given Congress's expressed intent to *strengthen* the waiver provisions, it is unlikely Congress intended to apply the specific 4-year requirement to California.

For the foregoing reasons, no modifications are made in response to this comment.

113. Comment: Both the criteria and GHG standards rapidly decline in the 2020-2025 timeframe resulting in substantial risk and uncertainty for automakers. Recognizing this, Tier 3 provides an up-to-8-year life (with some restrictions) for FTP and SFTP NMOG+NOx credits earned in the 2017-2024 model years (MY). This provides automakers flexibility to earn credits in the early years to address market and technology uncertainties in the later years. LEV III does not provide this extension (LEV III allows credits to be carried over for 5 years), and the proposed regulations do not harmonize with Tier 3's extension. The extended carryover would not affect overall emissions since emission reductions would be the same in both cases, only earned earlier if the longer carryover is allowed. We understand the staff's concern regarding technology development and appreciate the staff plans to review this as part of the Mid-Term Review; however, this is an extraordinarily challenging time for both criteria and greenhouse gas emission reductions, and the timing for the Mid-Term Review would not allow automakers sufficient time to both earn credits and use them. We recommend harmonizing LEV III with Tier 3 for this issue. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: These comments request the extension of credit life from five years to eight years, which falls outside the scope of this rulemaking. The reasons that the extension of credit life was not included in this rulemaking were discussed extensively in Staff's Initial

Statement of Reasons (pp. 27-29). Therefore, no changes are made in response to this comment.

114. Comment: The Tier 3 regulations use the pooled 50-state sales to determine compliance with the NMOG+NOx fleet average and the various phase-in requirements in their regulations. The LEV III regulations, however, use the pooled California plus Section 177 State (CA+177 States) sales to determine compliance with the same. The lack of harmonization will result in automakers managing two fleets – a 50-state fleet and a CA+177 State fleet. Admittedly, this difference in the regulations is primarily an administrative burden and pooling the CA+177 States fleets (adopted in LEV III) dramatically reduced the administrative burden (prior to LEV III, automakers were required to track and manage 13 fleets – CA, eleven 177-State fleets, and the federal fleet). Nonetheless, harmonizing with Tier 3 by adopting 50-state pooling is unlikely to have an appreciable environmental impact. In fact, to the extent California's fleet is composed of smaller passenger cars than the national fleet, 50-state pooling could result in a marginal benefit to California emissions. We recommend harmonizing LEV III with Tier 3 for this issue. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment requests that compliance with the LEV III regulations be changed to a 50-state sales basis and falls outside the scope of this rulemaking. In addition, this issue was discussed extensively in the Staff Report for this rulemaking. Therefore, no response is required.

115. Comment: Under Tier 3, the cold (20^{o}F) standards exempt vehicles operating on E85. LEV III does not exempt E85 vehicles. We recommend harmonizing with the Tier 3 requirements explicitly exempting FFVs from cold CO testing on E85. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment requests changes to the cold (20^{o}F) CO requirements and falls outside the scope of this rulemaking. Therefore, no response is required. However, staff would like to note that the cold (20^{o}F) standards have applied to vehicles operating on E85 in California since the 1996 model year. Since we have seen no evidence that indicates that requirement is no longer needed, staff does not believe that it is appropriate to remove this requirement simply to align with Tier 3.

116. Comment: The LEV III regulations require full LEV III certification (E10 fuel and 150,000-mile durability) for any vehicle used to meet the 3 mg/mile PM phase in percentage requirements. Tier 3 allows "interim Tier 3 vehicles" (those certified on E0 with 120,000-mile

durability) to count toward the PM phase in. Regardless of the PM phase in, all vehicles must meet all of the LEV III requirements by 2020. We recommend harmonizing with Tier 3 by allowing LEV II certified vehicles to meet PM Standard. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment requests changes to the phase-in requirements to the primary 3 mg/mi PM standard and falls outside the scope of this rulemaking. Therefore, no response is required. However, in order to ensure the public health benefits of the 3 mg/mi PM standard, staff believes that vehicles should continue to be certified on gasoline that is representative of California commercial gasoline and the 150,000 mile full useful life durability requirement should not be relaxed.

117. Comment: The regulations specify the 50°F standards are 4,000-mile standards for NMOG+NOx and formaldehyde, but CO is not mentioned. We recommend copying this paragraph into §1961 (LEV II regulations). If this cannot be accomplished based on the current regulatory package, we recommend doing so as soon as possible. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Changes to CCR §1961 (LEV II regulations) are outside the scope of this rulemaking. Therefore, no response is required.

118. Comment: The California 50^{o}F test procedure doesn't reference sections like LDTP Subpart II, section D; there is no mention of the highway test and relevant CFR sections. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment concerns the California 50^{o}F test procedure and falls outside the scope of this rulemaking. The proposed changes to the California 50^{o}F test procedure was limited to a re-numbering of its section in the LDTPs. Therefore, no response is required.

119. Comment: *Ethanol retention checks for Sealed Housings for Evaporative Determination (SHEDs):* "As such, staff believes it is still necessary to require SHED retention checks with ethanol regardless of how the ethanol component of the sample is accounted for (adjustment factor or direct measurement)." This requirement is burdensome, not harmonized with EPA. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment requests changes to the ethanol retention checks and falls outside the scope of this rulemaking. Therefore, no response is required. Staff will consider the appropriateness of this change at a future time.

120. Comment: Calibrations:
1.1: "…and methanol retention check…"
1.1.3: "The HC and methanol measurement and retention checks…shall be performed on a monthly basis. (If six consecutive monthly retention checks are successfully completed without corrective action, the following procedure may be determined quarterly thereafter as long as no corrective action is required."
Comment: Burdensome, not harmonized with EPA.
§ 86.117-96 "Ethanol retention checks may be performed instead of methanol retention checks. Alcohol retentions may be omitted if no alcohol - fueled vehicles will be tested in the evaporative enclosure."
§ 86.117-96 (c), "The methanol retention check must be performed only upon initial installation and after major maintenance, consistent with good engineering judgment. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This is outside of the scope of the 45-day notice, but staff may re-evaluate retention check requirements in a future rulemaking.

10. Other Comments

121. Comment: Appendix K – List of proposed changes to Title 13, CCR and Incorporated Test Procedures: Title 13 Changes – section 2.3 says: "This section was deleted, as the calculations therein are now contained in 40 CFR Part 1066 section 1066.935." Comment: Correct typographical error; §1066.935 should be §1066.635. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: No changes to Appendix K are required, since it is simply a list of proposed changes to the regulations and test procedures and has no regulatory impacts.

122. Comment: We would like to recommend that ARB include an additional amendment package in early 2015 to address any remaining issues to harmonize LEV III with Tier 3. In the meantime, we will continue to work with staff to identify additional areas where updates are necessary to ensure harmonization to the fullest extent possible. (Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment requests that ARB hold another LEV III hearing in 2015, which the Board declined to direct staff to do. Therefore, no response is required.

123. Comment: We would like to work with ARB staff in the coming months and bring those additional changes back to the Board for your review and approval in early 2015 to further streamline the test procedures and harmonize LEV III a little bit more with Tier 3. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers)

Agency Response: This comment requests that ARB hold another LEV III hearing in 2015, which the Board declined to direct staff to do. Therefore, no response is required.

B. COMMENTS RECEIVED DURING THE FIRST 15-DAY COMMENT PERIOD

1. Comments Concerning the LEV III Exhaust Emissions Regulations

124. Comment: LEV III PM Emission Data Vehicle Selection: As part of the 15-Day Notice, ARB included the following language: "Within each test group, the vehicle configuration shall be selected which is expected to be worst-case for FTP PM exhaust emission compliance on candidate in-use vehicles." This additional sentence is unnecessary, could add significant testing burden, and should be deleted. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff believes that it is appropriate for a manufacturer to demonstrate compliance with the LEV III PM standards using vehicles that are expected to be worst case for PM emissions. Furthermore, no individual manufacturer has demonstrated to staff that this requirement may create a significant test burden. Therefore staff is not proposing to remove this requirement.

125. Comment: Certification of a Federal Vehicle in California: Although we expect that Federal vehicles certifying to Bin 85/110 will only be Federal vehicles, ARB has added the following sentence in the 15-Day Notice: "A federal vehicle shall not qualify as an alternative to a LEV III vehicle." This additional sentence is confusing. We believe that this statement would only apply to the 3 mg/mile PM phase in (i.e., a Federal vehicle cannot be used to satisfy the PM phase-in requirements). If this is the case, we recommend ARB revise this sentence to read, "A federal vehicle cannot be used to satisfy the PM phase in requirements of Section E.1.1.2.1.1 (Particulate Standards for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles) of these test procedures." (Steven Douglas, Senior Director,

Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This sentence is a clarification of an existing requirement that a federal vehicle cannot be sold in California as an alternative to a LEV III vehicle. This comment demonstrates that the current test procedure is confusing to industry, and is therefore, necessary. Therefore staff is not proposing to modify this language.

126. Comment: Part I, Section D of the LDTPs: (Repeat comment) No NMOG equation for fuels between E0 and E10, recommend following §1066.635 equation. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: No NMOG equation is needed for fuels between E0 and E10, because there are no California certification gasoline blends between E0 and E10.

2. Comments Concerning the Test Procedures for 2018 and Subsequent Model Hybrid Electric Vehicles

127. Comment: One correction alone to the plug-in hybrid electric vehicle (PHEV) test procedures warrants a second 15-Day Notice. The test procedures appear to allow the battery to supplement the internal combustion engine during emissions test cycles, which was not ARB's intent. We believe this should be corrected before finalizing the regulations. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: The commenter is referring to a provision where the manufacturer may set the battery SOC prior to performing the Urban Charge Sustaining emission test when using the criterion in J1711, Appendix C to determine compliance with end of test SOC. Staff agrees and has modified the test procedures accordingly in the second 15-day modifications. Specifically, SOC setting is not allowed after the UDDS precondition cycle and before the emission test if the end of test criteria of Appendix C of SAE J1711 is to be used.

128. Comment: F.10: For HEV (F), 20^{o}F testing, the worst case language needs to mimic the 50^{o}F testing language like "...as determined...". Also (repeat comment) 20^{o}F testing, the worst case being different (CO), may require 2 - 75^{o}F worst case tests (burden). Suggest making worst case criteria NMOG+NOx for 20^{o}F as well or good engineering judgment. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: See response to Comment 88.

129. Comment: G.5.2.8: typographical errors, G.5.4.2 (ii) and G.5.4.2 (iv) should be G.5.4.5 (ii) and G.5.4.5 (iv). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the second 15-day modifications.

130. Comment: G.5.4.5: (Repeat comment) AER/EAER 0.98 ratio too tight. Make 0.95 like originally proposed. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: See response to Comment 76.

131. Comment: G.5.4.5: The word "or" should be replaced by "and" in the sentence "…..may demonstrate compliance with applicable exhaust emission standards using this section G.5.4.5 in lieu of sections G.5.3 ~~or~~ and G.5.4.2." (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the second 15-day modifications. In addition, the word "through" was replaced with "and" in section G.5.4.2.11 as a first 15-day modification since this section amends two subparagraphs and not a series of subparagraphs.

132. Comment: G.5.4.5: Is it really necessary to add the complication and restriction of "Rounding the calculated AER/EAER ratio up to 0.98 is prohibited"? Industry already feels that the 0.98 ratio may be too restrictive, and now it is more restrictive with the elimination of rounding. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff disagree that allowing rounding would simplify the AER/EAER ratio calculation. As mentioned previously, the 0.98 ratio is purposefully restrictive to limit the Alternative Urban Charge-Depleting Emission Test to those PHEVs that have little to no blended operation during charge-depleting operation and thus, minimal opportunity for such operation in-use.

133. Comment: G.5.4.5 (iv): Language is somewhat conflicting with language in the 4th paragraph of section G.5. Section G.5. language states "For example, a charge-increasing driver-selectable mode is not compatible with a charge-depleting test". The title of the alternative test in section G.5.4.5 (iv) indicates it's a "Charge-Depleting" test, but the procedure invokes charge-increasing modes/operation. We

understand the intent and the procedure in G.5.4.5 (iv) is viable, it's just that the language conflicts (charge-increasing operation on a charge-depleting test). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the second 15-day modifications. Specifically, the title of section G.5.4.5(iv) has been modified to read, "Dynamometer run to determine Urban Emissions."

134. Comment: G.5.5.1: Charge-Depleting test mass calculations, what is included in charge-depleting hot start cycles (up until charge-sustaining?). "n" was removed, not sure where the guidance is? May be ok, just covered elsewhere? (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: The "n = hot-start UDDS cycle" was deleted since "n" is not part of the equation. The number of hot-start UDDS cycles that are included in $\sum m_h$ and $\sum D_h$ varies and is governed by the end-of-test options that a manufacturer may choose. No modifications were made in response to this comment.

135. Comment: G.6: Highway Equivalent All-Electric Range Test needs a J1711 3.9 allowance for expanded EOT tolerance, like Charge-Depleting UDDS test. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the second 15-day modifications.

136. Comment: G.8: 20°F testing, the worst case language needs to mimic the 50°F testing language like "...as determined...". Also for 20°F testing, the worst case being different (CO), may require 2 - 75°F worst case tests (burden). Suggest making worst case criteria NMOG+NOx for 20°F as well or good engineering judgment. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: See response to Comment 88.

137. Comment: General Comment: Guidance on Charge-Depleting testing regarding no sampling during AER modes? §1066.501(c) deleted. May be covered elsewhere like in the 45-day notice? (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has modified the test procedures accordingly in the second 15-day modifications. Specifically, guidance was added stating that emission sampling is not required during all-electric range (AER) testing for both Urban and Highway AER testing for those cycles where the engine did not turn on at any time during the test cycle.

138. Comment: General Comment: (Repeat comment) should be no setting of SOC after UDDS prep and using J1711 appendix C. Likewise for multiple prep cycles. May be ok, language appears to limit this setting of SOC and multiple cycles only for meeting F.9 and G.10. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: See response to Comment 127.

139. Comment: General Comment: Charge-increasing testing. In reviewing the detailed test procedures, it appears that some vehicle architectures may not achieve the intended charge-increasing operation. Some suggested test procedure changes attached (draft). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff included charge-increasing operation in the test procedures to address industry's request to provide procedures to test this type of PHEV operation. As such, PHEVs that have charge-increasing operation or a driver-selectable charge-increasing mode will have procedures to measure emissions. For those PHEVs that do not have either charge-increasing operation or a driver-selectable charge-increasing mode, then the PHEV would not be required to perform emissions tests with either charge-increasing operation or driver-selectable charge-increasing mode. To additionally address this comment, changes were made to the procedures to better ensure that the charge-increasing operation was occurring during the emission test. Specifically, some of the procedures now require the vehicle to be operated in default or normal mode for the preconditioning cycle and not operated in charge-increasing mode until the start of the emission test cycle itself.

140. Comment: General Suggestion: ARB should include graphics to help explain the modes of operation (CS, CI, CD). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and has included graphics in the second 15-day modifications.

141. Comment: General Suggestion: Products today could have two CS operating conditions. One “normal” CS, and another CS operation that occurs at the end of a CI operation. Throughout the PHEV procedures there is only a reference to CS (so “which one?”). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: The CS operation in the PHEV procedures is based on a “normal” CS operation or the CS operation that occurs after the batteries have been fully depleted and the engine is sustaining the charge. Any CS operation that occurs after a charge-increasing mode or due to a charge-holding mode is not considered CS operation for emission testing purposes.

3. Comments Outside the Scope of the First 15-Day Notice

142. Comment: I am the owner of older model heavy-duty vehicles that use gasoline engines. The vehicle I am currently repairing is a 1976 model year dump truck, but may have an older model year engine. The vehicle GVWR is 15000 lbs. The intended use of this vehicle is for hauling rock and gravel for driveway maintenance. I am a rural land owner and I maintain my property, including the gravel driveway. I only need to use the vehicle a few times a year, driving a total of 1000 miles or less annually. I think there should be an exemption from smog inspections for gasoline powered vehicles that travel less than 1000 miles annually. Unless the vehicle license plate number is reported to the California Air Resources Control Board, as having visible smoke in the exhaust, the vehicle should not be required to have biennial smog inspections. The mileage could be verified by an electronic devise, or by a California Highway Patrol Officer, or some other means. Having biennial inspections for low use vehicles is difficult and expensive. I cannot even find a reference for exhaust emission standards at the time of engine manufacture. Every reference I have found is for engines manufactured subsequent to 1978. So why do the new regulations require engines manufactured subsequent to 1976 meet certain emission standards? The new emission regulations effectively prohibit the use of vehicles manufactured in 1976 and 1977. This imposes an unfair burden on owners of 1976 and 1977 model year heavy-duty vehicles. (David Lanatti)

Agency Response: Smog inspections for heavy-duty vehicles are outside the scope of this rulemaking. Therefore, the comment is outside the scope of the first 15-day notice and no further response is needed. However, a link to the California Bureau of Automotive Repair Smog Referee program, which allows customers to get more detailed info, and special circumstance assistance, for the smog check requirements of a specific vehicle (one of the issues the commenter indicated he could not find for his 1976 truck) is:

http://www.foundationccc.org/WhatWeDo/BARSmogCheckRefereeProgram/ServicesforConsumers/tabid/895/Default.aspx

143. Comment: Any divergences between LEV III and Tier 3 can create unforeseen hardships at a later time. Consequently, we strongly recommend ARB align those items described in Attachment 1, during this rulemaking, or if for some reason they cannot be included at this time, then they should be addressed in the next rulemaking opportunity. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: California has its own unique air quality needs that require our own motor vehicle regulations. As stated in Resolution 14-34 for this rulemaking, ARB believes "It is not appropriate for California's air quality needs to relax the stringency of the LEV III program solely for the purpose of harmonizing with federal Tier 3 requirements." This is a general statement that is outside the scope of the first 15-day notice. Specific comments in Attachment 1 are addressed elsewhere in this document.

144. Comment: In our previous comments on the proposed regulation, we requested that ARB adopt the provision that excludes the 105,000-mile extra high mileage vehicle, in addition to the 75% extra-high mileage vehicle, from the in-use compliance program (IUCP) computation. When EPA adopted Tier 3, they excluded the 75% (which is 112,500 miles for a vehicle certified to 150,000 mile durability); however, the extra-high mileage vehicle is actually defined as "75% of useful life or 105,000 miles, whichever is lower." Thus, EPA inadvertently left off the "105,000 miles" in the Tier 3 regulation. We understand that EPA intends to correct this in a soon-to-be-released Direct Final Rule. We recommended making the correction in this update to LEV III. We would have preferred ARB to make the corrections in the current rulemaking to maintain alignment with EPA (once EPA's change is adopted in the upcoming Direct Final Rule) and consistency with the original intent of the IUVP/IUCP program, we understand that this is now beyond the scope of this rulemaking. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment does not pertain to the proposed first 15-day changes and is, therefore outside the scope of the first 15-day notice. (See response to Comment 4.)

145. Comment: Another topic that we believe should be aligned, but did not appear in the 15-Day Notice, is the terminology used to define the vehicle selection of PM test data vehicles. We strongly recommend that ARB change the terminology in order to more fully align with EPA's requirements. (Steven Douglas, Senior Director, Environmental

Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment does not pertain to the proposed first 15-day changes and is, therefore outside the scope of the first 15-day notice.

146. Comment: Subpart H of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines": E0 fuel reference in two places, don't reference 1065.710(c), instead part 86.113… (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment does not pertain to the proposed first 15-day changes and is, therefore outside the scope of the first 15-day notice. However, the applicable certification gasoline specifications for heavy-duty vehicles and engines are contained in CFR §1065.710(c). Therefore, this is the correct citation.

4. Comments Requested to be Addressed in the Final Statement of Reasons for this Rulemaking

147. Comment: Bin 85/110: ARB did not address our request to include language that explicitly states that Bin 85/110 vehicles will be certified to 120k (FTP, SFTP, and highway NOx/NMOG+NOx). In discussions with ARB staff, staff stated their understanding that federal vehicles certified to Bins 85/110 will be 120,000 mile durability vehicles, and additional language clarifying this point is unnecessary. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: See response to Comment 14.

148. Comment: Bin 85/110: Per our previous comments, we also request that ARB clarify in the FSOR that our understanding is correct that Bins 85/110 vehicles will be certified as "Federal Bin 85 (110, 3, 4, etc.)" and should be labeled as such on the emission certification label in the FSOR. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: See response to Comment 15.

149. Comment: In our previous comments, we recommended that ARB harmonize with the Tier 3 requirements for Cold CO, including an explicit exemption for FFVs from the Cold CO testing on E85. We understand, and support, that ARB is simply referencing the EPA Cold CO requirements, and there is no intent or requirement to conduct

Cold CO testing on FFVs using E85. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: See response to Comment 115.

150. Comment: We previously recommended that ARB allow federal vehicles certifying in California to be tested (for the purposes of SFTP) at LVW rather than ALVW for 6,001-8,500 GVWR light-duty trucks. ARB agreed to accept certification data using SFTP at LVW, with an attestation that the vehicle would meet the standards at ALVW, for federally certified vehicles (Bins 3, 4, 85, and 110). ARB would reserve the right to test vehicles at ALVW. We believe these allowances to accept LVW and reserve the right to test at ALVW should be included in the FSOR. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: See response to Comment 7.

C. COMMENTS RECEIVED DURING THE SECOND 15-DAY COMMENT PERIOD

1. General Comments

151. Comment: Industry requests the Executive Officer grant interim approval to optionally use the LEV III/Tier 3 harmonized emission standards, test procedures, and equipment in this LEV III package (i.e., the draft regulatory text contained in the Initial Statement of Reasons released 2-Sep-2014 as modified by the 1st and 2nd 15-Day Notice) prior to the effective date of these regulations. Additionally, we request a similar allowance for the current 2009-2017 HEV & PHEV test procedures, as these still require LEV II & Tier 2 test procedures to be utilized (for example, PM measurements). (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: ARB is aware of the situation the commenter describes, and will continue to work with industry to accommodate and to address the expressed concerns.

2. Comments Concerning the LEV III Exhaust Emissions Regulations

152. Comment: LDTP Part II, A, section 100.3.1.2 (page A-10): First sentence typo “may shall” needs to be just “may”
(Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: In the original 45-day notice version of the proposed changes to the LDTPs, Part II, A, section 100.3.1.2, the word "shall" was struck out and replaced with the word "may." The word "shall" was not reinserted as part of either the first 15-day changes or the second 15-day changes. However, through an apparent glitch in the word processing program that was used to write the regulatory documents, the strikeout disappeared from the word "shall" at the time the first 15-day notice was issued. Since this word was struck out as part of the regulatory process, but it was not reinserted as part of the regulatory process, it has been struck out in the final version of the LDTPs.

153. Comment: LDTP Part II, A, section 100.3.4.3 (page A-11): Typo, "…40 CFR §1065.710 15(b)…"
(Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees that this CFR citation contains a typographical error and it has been fixed in the final version of the LDTPs. (See Part II, Section C of this document, which explains non-substantial modifications to the test procedures.)

154. Comment: LDTP Part III: (Page A-17): Typo, "…VHEHICLES…" is misspelled in the title.
(Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: The language in question is not actually part of the LDTPs. Rather, it is part of the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles." As with Comment 152, the word "VEHICLES" was spelled correctly in the original 45-day notice version of the proposed changes to these test procedures. Also, as with Comment 152, the additional "H" was not added as either a first 15-day change or a second 15-day change. Since the additional "H" was not added as part of the regulatory process, it has been removed in the final version of these test procedures.

3. Comments Concerning the Test Procedures for 2018 and Subsequent Model Hybrid Electric Vehicles

General Comments on Parts F & G

155. Comment: In multiple locations in parts F & G, the regulations require OEMs to determine the worst case NMOG+NOx emissions individually for each test schedule, which is burdensome (potentially dual or multiple tests required per cycle). There is a provision in G.5 (only) to minimize this testing by allowing "…a manufacturer may

determine the worst case operating mode by using non-certification emission data and/or an engineering evaluation." This is an important flexibility but only applies to a very limited number of vehicles and test types, namely only for UDDS testing and only for PHEV's. Again, this worst case requirement applies to all hybrid testing (plug-in and non-plug-in vehicles) on all cycles, which is a significant test burden. To minimize this testing burden in general, the regulations should allow the same engineering analysis like G.5 for all hybrid testing. We suggest putting this same allowance in the introductory section of both F & G. so that it could be used for all testing. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: The provision that allows a manufacturer to determine worst case operating mode by using non-certification emission data and/or an engineering evaluation is provide in sections G.5 Urban Emission Test Provisions, G.6 Highway Emission Test Provisions, and G.7 SFTP Emission Test Provisions. All these sections are associated with emission testing off-vehicle charge capable hybrid electric vehicles or PHEVs. HEVs that are not off-vehicle charge capable hybrid electric vehicles are emission tested similar to conventional vehicles that feature various driver-selectable modes such as "sport" and "economy." Conventional vehicles are not allowed the provision of determining worst case emissions by using non-certification emission data and/or an engineering evaluation. HEVs, likewise, were not provided this provision. No modifications were made in response to this comment.

156. Comment: "Additional End-of-Test Criterion" is an important and appreciated provision in the regulations which will streamline testing for both OEMs and agencies alike. The regulation requires "…approval from the Executive Officer…" in order to use these flexibilities. The ability to use these alternative end-of-test criteria needs to be approved either early in the vehicle development / certification process, or quickly during certification testing. It is unclear how this approval process will work so as not to adversely impact the certification process. We suggest allowing a more global approval process per OEM to alleviate these concerns. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: The requirement to obtain approval from the Executive Officer to use end-of-test options was added to be consistent with 40 CFR §1066.501(a)(2)(ii) where Administrator approval is required to use "alternate End-of-Test criterion." No modifications were made in response to this comment.

157. Comment: "Appendix C of SAE J1711 may not be used to correct measured values for any emissions." This should be allowed for CO_2 (FE). We believe this was a typographical mistake since it was in the

previous 15-Day Notice and is an important provision in the use of Appendix C. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: CO_2 emissions for PHEVs are measured over defined test cycles like they are for any other pollutant. For the purpose of calculating fuel economy, Appendix C of SAE J1711 allows measured CO_2 emissions to be "corrected" to account for battery state of charge. However, for the purpose of complying with the GHG regulations, CO_2 emissions for all vehicles are the measured value over the applicable test cycles.

Comments on Part F

158. Comment: F.1 (page A-36): The test procedures for 2018 MY and later Zero-Emission Vehicles, states that "ZEVs and HEVs must be tested using an electric dynamometer meeting the requirements of 40 CFR Part 1066 Subpart C." (emphasis added) However, recognizing the resources involved with changing dynamometers, the EPA Tier 3 regulations do not require testing on an electric dynamometer meeting the requirements of 40 CFR Part 1066 Subpart C ("1066-compliant dyno") until the 2022 MY. ARB incorporates the EPA Tier 3 migration (i.e., no requirement for a 1066-compliant dyno until 2022 MY) in the preceding two paragraphs regarding migration. Based on discussions with ARB staff, we understand that it is not ARB's intent to require testing on a 1066-compliant dyno prior to the 2022 MY. We request that ARB staff clarify this in the FSOR. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff did not intend that chassis dynamometers meet 40 CFR Part 1066 Subpart C (1066-compliant dynamometer) requirements when these test procedures become effective with the 2018 model year. Staff's intent was to ensure that 1066-compliant chassis dynamometers were ultimately used for certification as opposed to using non-1066-compliant chassis dynamometers. Staff agrees with harmonizing with the EPA Tier 3 regulations where 40 CFR Part 1066 Subpart C chassis dynamometers would not be fully phased-in until the 2022 model year. No modifications were made in response to this comment.

159. Comment: F.3 (page A-36): This section contains the zero-emission vehicle range testing. However, it does not mention SAE J1634 or provide an option for multi cycle test method. Will manufacturers be required to run a full city and highway deplete test? These tests are a substantial burden on test labs with respect to both site and personnel time. The multi cycle test method significantly reduces this burden and EPA has allowed at least one OEM to use this method. To put the burden in perspective, the multi cycle test method can normally be

completed within one shift. In contrast, a full city delete may take three full shifts or more to complete and the highway depletion has similar time requirements. This 83 percent reduction in workload (six shifts vs one shift) is very significant. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Section F.3.1.1 allows manufacturers the option to use SAE J1634 and states, "As an option, a manufacturer may elect to determine the urban all-electric range for a battery electric vehicle in accordance with SAE J1634." No modifications were made in response to this comment.

160. Comment: F.8.2.5 (page A-46): Typo, "G.10" should be "F.9" (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Staff agrees and will pursue a correction to this typographical error.

Comments on Part G

161. Comment: G.5.2.8.3 (page A-52): The regulatory language doesn't mention resetting the SOC to lowest level after the prep for non-selectable charge increasing vehicles as shown in section I. figure 7. This seems inconsistent with G.5.2.8.1 and G.5.2.8.2 where after prep setting of SOC guidance is provided. This resetting the SOC for non-selectable charge increasing vehicles may be mentioned elsewhere, but don't see where? (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Figure 7 in Section I correctly shows the SOC being reset to the lowest level after preconditioning a vehicle that drives in charge-increasing operation. The language in G.5.2.8.3 should have included guidance to set the SOC to the lowest level after vehicle preconditioning. However, since this type of PHEV is not yet available, the proper method for testing charge-increasing operation is uncertain. Admittedly, this type of PHEV may revert to all-electric operation at the start of the cold-start UDDS cycle if the SOC is not reset to the lowest level after the preconditioning drive. However, by the end of the test, this vehicle would be required to experience a cold-start in order to satisfy any of the end-of-test conditions and be considered a valid test. As such, the resetting of the SOC to the lowest level may not be necessary. The agency will continue to work with industry to develop proper test procedures for PHEVs with charge-increasing operation.

162. Comment: G.5.3.18.2 (page A-55): Additional EOT Criterion Clarification "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." Instead of using "End SOC ≥ Start SOC," we plan to optionally use "(Amp-hr_{final}) ≥ (Amp-$hr_{initial}$)," since Amp-hours can be read from Hioki meter. We propose this interpretation of G.5.3.18.2. (Note: We do not think this is a new request or "out of scope," since it is a clarification of the requirement, but request confirmation in the FSOR.) (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Comment: G.5.3.18.2: Additional End-of-Test Criterion. The text of the additional criterion states: "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." We propose that this also be interpreted to mean that the net energy change of the battery (in Amp-hr) is positive; in other words, more energy has gone into the battery during the test than has come out. The other instances of this additional criterion occurring in the document should be interpreted in the same way. (Kevin D. Webber, General Manager, Vehicle Regulation & Certification Engineering, Toyota Motor Engineering & Manufacturing North America, Inc.)

Agency Response: Staff agrees with the interpretation that (Amp-hr_{final}) ≥ (Amp-$hr_{initial}$) is an accurate interpretation of G.5.3.18.2 where it states, "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." Therefore, a test can be declared valid if (Amp-hr_{final}) ≥ (Amp-$hr_{initial}$) for a PHEV that uses a battery as an energy storage device.

163. Comment: G.5.4.2: Urban Charge-Depleting Test "Warm-Up" Extra Cycle: G.5.4.2 states: "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...." We feel that conducting two hot-start UDDS cycles is essential for accurate emission testing. Also, since the term "fully warm" is not defined in this document, there is no clear way to determine whether or not a third cycle may be run. Therefore, we recommend that this "fully warm" requirement be removed, and a third cycle be allowed according to the manufacturer's discretion. (Kevin D. Webber, General Manager, Vehicle Regulation & Certification Engineering, Toyota Motor Engineering & Manufacturing North America, Inc.)

Agency Response: Staff provided manufacturers the option to perform an additional hot-start cycle so the effects of an engine starting near the end of a cold-start UDDS cycle could be mitigated. Under these

circumstances, the emissions from the subsequent hot-start UDDS may be elevated due to the engine not achieving full warm-up conditions. However, if the engine started near the beginning of the cold-start UDDS, the engine would most likely be able to achieve fully warm conditions. Therefore, staff did not want to require a second hot-start UDDS cycle because of the added test burden. The term "fully warm" was purposely not defined leaving this determination to each individual manufacturer for added flexibility. However, for confirmatory testing and in-use compliance testing, the agency would be required to perform two hot-start UDDS cycle to assess the vehicle's compliance with emission standards. In addition, Wwith the allowance of multiple end-of-test options, manufacturers should understand that the Urban Charge-Depleting Emission Test is not strictly limited to two hot-start UDDS cycles during following the cold-start UDDS cycle. No modifications were made in response to this comment..

164. Comment: G.5.4.2.1: 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 that may cause a less than hot engine start for 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…." We recommend removing the "fully-warm" requirement to conduct an additional hot-start cycle. Two Hot Start cycles are essential for emission test under the stable warmed up condition, so the manufacturer should be allowed to conduct 3 cycles by choice at any time, without restriction. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: See response to Comment 163.

165. Comment: G.5.4.2.17 (page A-57) Primary EOT Criterion. We believe the definition of Initial and Final Amp-hour in the text is a mistake, because it conflicts with p. A-50 paragraph 8, p. A-52 5.2.8, and p. A-73 Figure 4. Paragraph 5.4.2.17 lists the primary EOT criterion as ≤ 1% NEC from the beginning of the first cycle to the end of the second cycle. However, this ignores any additional hot-start cycles driven after the first 2 cycles and cannot possibly be satisfied for a charge-depleting test. Paragraph G.5.4.3.1 lists additional EOT criterion as SAE J1711 section 3.9 with permission of Executive Officer. SAE J1711 section 3.9 is the same as paragraph G.5.4.2.17 but considers the NEC over the last cycle or set of cycles, not the first 2 cycles. This additional EOT criterion (not the primary criterion) is what is shown in Figure 4. We recommend changing the paragraph G.5.4.2.17 definition of beginning and end SOC to match SAE J1711 section 3.9. Since this is primary EOT criterion, it does not require permission of Executive Officer. Then the Additional EOT criteria (which need permission) can be 1) SAE J1711 3.9.1, and 2) Final SOC > Initial SOC. (Steven Douglas, Senior Director, Environmental Affairs,

Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Comment: G.5.4.2.17: Primary End-of-Test Criterion. G.5.4.2.17 describes the primary end-of-test criterion as ≤1% Net Energy Change from the beginning of the first cycle to the end of the second cycle.

5.4.2.17 Amend subparagraph (d)(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, ($Amp\text{-}hr_{initial}$) is the stored charge at the beginning of the cold-start UDDS cycle, and ($Amp\text{-}hr_{final}$) 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, ($Amp\text{-}hr_{final}$), shall not exceed either $(Amp\text{-}hr_{final})_{max}$ or $(Amp\text{-}hr_{final})_{min}$ for a valid test.....

This start and end point is a carryover from HEV testing and cannot possibly be fulfilled in a charge-depleting test unless the engine turns on immediately at the beginning of the first cycle.

As shown by the two arrows indicating initial and final Amp-hr, even the example test shown in Section I Figure 4 does not fulfill this primary criterion. Additionally, the end point being identified as "$NEC_{Tolerances}$", as opposed to "$NEC_{options}$", indicates that no additional end-of-test criteria may be used to validate this test.

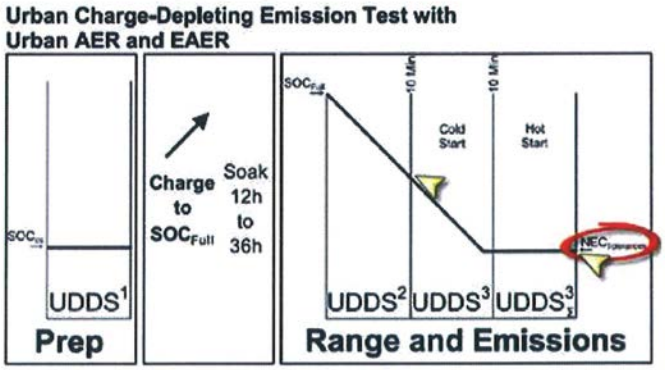

Figure 4

$NEC_{Tolerances}$: Net Energy Change Tolerances required
NEC_{option}: NEC Tolerances apply; however, option available to validate test when SOC final > SOC initial.

Given that this test allows more than two cycles, the primary end-of-test criterion also ignores any cycles driven after the first two.

We propose that the primary end-of-test criterion be changed to apply over the last cycle or set of cycles, as described in p. A-50 paragraph 8 for compliance and in-use testing. This also follows the spirit of the end-of-test criteria described for charge-depleting tests in SAE J1711 sections 3.9 and 3.9.1, shown here:

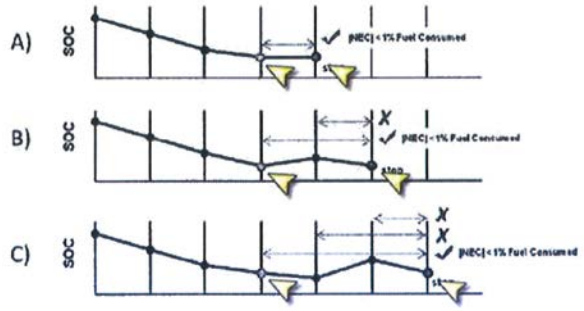

FIGURE 4 - SEVERAL SCENARIOS OF EOT CRITERION

SAE J1711 3.9 EOT

(Kevin D. Webber, General Manager, Vehicle Regulation & Certification Engineering, Toyota Motor Engineering & Manufacturing North America, Inc.)

Agency Response: As the comments state, section G.5.4.2.17 lists primary end-of-test (EOT) criteria that require the net energy change in a battery, for instance, to be equal to or less than 1% of fuel energy consumed during a test. These EOT criteria have been used to validate HEV (as opposed to PHEV) emission testing where, admittedly, the vehicle can only be tested in charge-sustaining operation. Staff have found, however, that these primary EOT criteria are still applicable to PHEV emission testing even when testing charge-depleting operation. Certain types of PHEVs with no blended operation can satisfy the primary EOT criteria if the engine begins operating early in the cold-start UDDS cycle. Staff agrees that Figure 4 in Section I on page A-73 could be improved; however, the figures are for illustrative purposes and the language in the preceding sections A through H would take precedents. Regarding the language, in section G.5.2.8 on page A-52, the "±1% SOC Net Energy Change Tolerances in section G.10" are referenced which does not conflict but aligns with the primary EOT criteria listed in section G.5.4.2.17. And finally, the language in paragraph 8 of section G.5 on page A-50 provides ARB's protocol for confirmatory and in-use compliance testing. The agency is required to always perform two hot-start UDDS cycles following the cold-start UDDS cycle during an Urban Charge-Depleting Emission Test. This double hot-start requirement eliminates emissions being measured from a single hot-start where the engine may not have achieved full warm-up conditions following a cold-start near the end of the cycle. No modifications were made in response to this comment.

166. Comment: G.6. (HWY, page A-60), 7. (SFTP, page A-64) and section I, figure 6 (CI w/ button, page A-75) & figure 8 (CI w/o button, page A-76): For the HWY and SFTP test cycles, the two types of vehicles (w/ & w/o CI button) are being treated differently. Figure 6 shows testing with a CI button, and is technically correct, run the preps in CS then just before the emissions test switch to CI mode. However for vehicles w/o a CI button (figure 9), both the prep and the emissions

test are operated in CI mode, which allows the vehicle to charge up the battery during the prep cycle, then potentially use this battery energy during the emissions cycle. Doing so provides an unfair benefit for CO_2 emissions (fuel economy) and potentially other emissions. SAE J1711 has some algorithms which would mimic figure 6 (w/ button) for figure 8 (w/o button) by setting the initial SOC before the prep to a level to achieve minimal stored battery energy after the prep and just before the emissions cycle. We request that the regulations require that the SOC be reset to the lowest level after the prep but before the emission test or if that is not practical from a timing standpoint to provide for an approach like that used in J1711. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: Regardless of how much a battery is charged up during the preconditioning drive in a PHEV with charge-increasing operation, a valid test would require that the battery net energy change (NEC) not exceed a ±5% tolerance (as permitted by the SAE J1711 Appendix C end-of-test option) or have a higher SOC at the end of the test relative to the beginning of the test. These end-of-test options, let alone the narrower ±1% NEC tolerance, would limit any unfair advantage that this type of PHEV would gain. If these end-of-test operations prove insufficient for validating a test, the manufacturer would be able to request an alternative test procedure such as the SAE J1711 procedure to perform emission testing. The agency will continue to work with industry to further refine testing of PHEVs with charge-increasing operation.

4. Comments Outside the Scope of the Second 15-Day Notice

167. Comment: The current LEV regulations require manufacturers to conduct Cold CO tests on FFVs using E85 fuel. This is burdensome since it requires additional tests with a fuel that is not readily available. Moreover, this testing is unnecessary… We ask that this requirement be eliminated. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment does not pertain to the proposed second 15-day changes and is, therefore outside the scope of the second 15-day notice. (See response to Comment 115.)

168. Comment: Part I, Section D of the LDTPs: No NMOG equation for fuels between E0 & E10, recommend following §1066.635 equation (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment does not pertain to the proposed second 15-day changes and is, therefore outside the scope of the second 15-day notice. (See response to Comment 126.)

169. Comment: For the past several decades automakers have conducted an ethanol retention calibration of the Sealed Housing for Evaporative Determination (SHED). This is unnecessarily burdensome for manufacturers. Consequently, EPA eliminated the periodic ethanol retention calibrations but retained the requirement for SHED commissioning and major maintenance. We request that ARB also eliminate the requirement. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment does not pertain to the proposed second 15-day changes and is, therefore outside the scope of the second 15-day notice. (See response to Comment 119.)

170. Comment: Section A-8 of the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," (page A-23): This section requires E10 refueling test fuel for 2017 MY and beyond vehicles that certify on E10 test fuel for evaporative emissions. This aligns with the EPA Tier 3 requirements. Some OEMs may have optionally certified early to the CARB LEV III requirements. At that time, EPA Tier 3 was not officially adopted yet and the specified refueling test fuel was E0 (either Phase 2 or Tier 2). Some carryover provisions should be granted for these evaporative emission families that optionally certified to LEV III requirements earlier than required. One possible way to handle this is to revise Table 2 to indicate that this requirement is applicable to 2017 and subsequent new certification programs. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment does not pertain to the proposed second 15-day changes and is, therefore outside the scope of the second 15-day notice. However, staff will work with industry to evaluate the appropriateness of this request and, if need be, will address this concern in a future rulemaking.

171. Comment: Great care was taken to develop the additional end-of-test criteria for charge-sustaining PHEV tests. We propose that these additional criteria also be applied to hybrid emissions tests in Section F. (Kevin D. Webber, General Manager, Vehicle Regulation & Certification Engineering, Toyota Motor Engineering & Manufacturing North America, Inc.)

Agency Response: This comment does not pertain to the proposed second 15-day changes and is, therefore outside the scope of the second 15-day notice. However, the commenter should realize that

additional end-of-test criterion was previously added to section F for hybrid electric vehicle testing as part of the first 15-day modifications. Specifically, additional end-of-test criterion was added in sections F.6.3.17 Urban Emission Test, F.7.1.4 Highway Emission Test, F.8.1.2 US06 Emission Test, and F.8.2.7 SC03 Emission Test. No modifications were made in response to this comment.

172. Comment: F.10 of the HEV TPs: For HEV (F), 20°F testing, the worst case language needs to mimic the 50°F testing language like "...as determined...". Also (repeat comment) 20°F testing, the worst case being different (CO), may require two 75°F worst case tests (burden). Suggest making worst case criteria NMOG+NOx for 20°F as well or good engineering judgement. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Comment: F.10 (page A-48): For both 20 & 50°F testing, since we're following F.6, it implies we need to determine worst case NMOG+NOx at these lower temperatures (burden). PHEVs (per G.8) have the allowance to use the same worst case "as determined" at 75°F. (Note the previous Alliance and Global Automakers comments for G.8, 20°F testing, regarding using the same language "…as determined…" like the 50°F testing, plus for 20°F testing using the same NMOG+NOx criteria for worst case in lieu of CO avoids the burden of dual worst case testing). We request that the regulations be clarified to allow the worst-case determination at 75°F to be used for 20°F and 50°F testing for HEVs, like is being done for PHEVs to keep the test burden to a reasonable level. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment does not pertain to the proposed second 15-day changes and is, therefore outside the scope of the second 15-day notice. (See response to Comment 88.)

173. Comment: G.5.4.5 (page A-59): "0.98" criteria is too tight. The Alliance recommended a 0.95 criteria for the ratio of AER/EAER to provide some margin for errors. Also the rounding provisions on the ratio of AER/EAER seem unwarranted. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment does not pertain to the proposed second 15-day changes and is, therefore outside the scope of the second 15-day notice. (See response to Comments 76 and 132.)

174. Comment: G.8 of the HEV TPs: 20°F testing, the worst case language needs to mimic the 50°F testing language like "...as determined...". Also for 20°F testing, the worst case being different (CO), may require two - 75°F worst case tests (burden). Suggest

making worst case criteria NMOG+NOx for 20°F as well or good engineering judgement. (Steven Douglas, Senior Director, Environmental Affairs, Alliance of Automobile Manufacturers and Julia Rege, Director, Environment & Energy, Global Automakers)

Agency Response: This comment does not pertain to the proposed second 15-day changes and is, therefore outside the scope of the second 15-day notice. (See response to Comment 88.)

V. PEER REVIEW

Health and Safety Code Section 57004 sets forth requirements for peer review of identified portions of rulemakings proposed by entities within the California Environmental Protection Agency, including ARB. Specifically, the scientific basis or scientific portion of a proposed rule may be subject to this peer review process. Here, ARB determined that the rulemaking at issue does not contain a scientific basis or scientific portion subject to peer review, and thus no peer review as set forth in Section 57004 was or needed to be performed.

VI. LIST OF ACRONYMS AND ABBREVIATIONS

177 States:	All states, including the District of Columbia if applicable, that adopt California's LEV III program pursuant to section 177 of the federal Clean Air Act (42 U.S.C. § 7507)
AER:	All-electric range
ALVW:	Adjusted loaded vehicle weight
ARB:	California Air Resources Board
ASTM:	ASTM International (formerly called the American Society for Testing and Materials)
CARB:	California Air Resources Board
CCR:	California Code of Regulations
CD:	Charge-depleting
CFR:	Code of Federal Regulations
CH_4:	Methane
CI:	Charge-increasing
CO:	Carbon monoxide
CS:	Charge-sustaining
E0:	Gasoline that does not contain ethanol
E85:	Fuel blend of 85% ethanol and 15% petroleum fuel
EAER:	Equivalent all-electric range
EAEREC:	Equivalent all-electric range energy consumption
EOT:	End-of-Test
EPA:	United States Environmental Protection Agency
FE:	Fuel economy
FFV:	Fuel-Flexible Vehicle
FID:	Flame ionization detector
FSOR:	Final Statement of Reasons
FTP:	Federal Test Procedure
GC:	Gas chromatograph
GHG:	Greenhouse gas

GVWR:	Gross vehicle weight rating
HC:	Hydrocarbon
HEV:	Hybrid electric vehicle
HEV TPs:	“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 §1962.2, title 13, CCR)
HFEDS:	Highway Fuel Economy Driving Schedule
HWFET:	Highway Fuel Economy Test
HWY:	Highway
IUCP:	In-use compliance program
IUVP:	In-use verification program
LDT:	Light-duty truck
LDTPs:	"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, title 13, CCR)
LEV:	Low-emission vehicle
LVW:	Loaded vehicle weight
MDV:	Medium-duty vehicle
Mg/mi:	Milligram per mile
NEC:	Net energy change
NIST:	National Institute of Standards and Technology
NMHC:	Non-methane hydrocarbons
NMOG:	Non-methane organic gas
NOx:	Oxides of nitrogen
OBD:	On-board diagnostics
OEM:	Original equipment manufacturer
PC:	Passenger car
PHEV:	Plug-in hybrid electric vehicle
PM:	Particulate matter
ppbC:	Parts per billion carbon
ppmC:	Parts per million carbon
RAF:	Reactivity adjustment factor
SAE:	SAE International (formerly called the Society of Automotive Engineers)
SFTP:	Supplemental Federal Test Procedure
SOC:	State-of-charge
UDDS:	Urban dynamometer driving schedule
VEC:	Vehicle emission credit
ZEV:	Zero-emission vehicle