California Air Resources Board

Public Hearing to Consider Proposed Revisions to the On-Board Diagnostic System Requirements and Associated Enforcement Provisions for Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles and Engines, and Heavy-Duty Engines

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

Public Hearing Date: July 22, 2021
Agenda Item No.: 21-6-1

Table of Contents

I. General

The Staff Report: Initial Statement of Reasons for Rulemaking (staff report), entitled "Public Hearing to Consider Proposed Revisions to the On-Board Diagnostic System Requirements and Associated Enforcement Provisions for Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles and Engines, and Heavy-Duty Engines," released June 1, 2021, is incorporated by reference herein. The staff report contained a description of the rationale for the proposed amendments. On June 1, 2021, all references relied upon and identified in the staff report were made available to the public.

On July 22, 2021, the California Air Resources Board (CARB or Board) conducted a public hearing to consider staff's proposed amendments. At the conclusion of the hearing, the Board approved Resolution 21-15 approving for adoption the proposed amendments to sections 1968.2, 1968.5, 1971.1, and 1971.5 of title 13, California Code of Regulations (CCR), that were initially proposed by staff and described in the Notice of Public Hearing (45-day notice) and staff report. The resolution directed the Executive Officer to make any additional conforming modifications available for public comment, with any additional supporting documents and information, for a period of at least 15 days and consider written comments submitted during the public comment period, and to make any modifications as may be appropriate in light of the comments received. The Executive Officer was directed to then either adopt the final regulatory amendments or to present the amendments to the Board for further consideration if warranted in light of the comments.

After the June 22, 2021, public hearing, staff proposed modifications to the originally proposed amendments to title 13, CCR sections 1968.2, 1968.5, 1971.1, and 1971.5. The text of the proposed modifications to the originally proposed amendments and additional supporting documents were made available for two supplemental 15-day comment periods through a "Notice of Public Availability of Modified Text and Availability of Additional Documents" (first 15-day notice) and "Second Notice of Public Availability of Modified Text," (second 15-day notice). The 15-day notices and the attachments were distributed on February 15, 2022, and April 22, 2022, respectively, to all stakeholders, interested parties, and to other persons generally interested in CARB's rulemaking requirements applicable to on-board diagnostic (OBD) systems.

Written comment letters were received from 6 individuals or organizations during the 45-day comment period. Oral comments were presented by 3 individuals or organizations. Zero written comments were received on the day of the Hearing. At the conclusion of the hearing, the Board adopted Resolution 21-15, which approved the proposed amendments to the regulation for adoption. Four comments were received during the first 15-day comment period and zero comments during the second 15-day comment period.

The resolution also directed the Executive Officer to finalize the Final Statement of Reasons (FSOR) for the regulatory amendments and to submit the final rulemaking package to the Office of Administrative Law for review. The FSOR updates the staff report by identifying and providing the rationale for the modifications made to the originally proposed regulatory text, including non-substantial modifications and clarifications made after the close of the 15-day comment periods. This FSOR also contains a summary of the comments received by CARB on the proposed amendments during the 45-day and 15-day comment periods and oral comments given at the Board hearing on July 22, 2021, and contains the modifications and CARB's responses to those comments.

A. Mandates and Fiscal Impacts to Local Governments and School Districts

The Board has determined that this regulatory action will have a cumulative $1,005,803 in cost and $976,977 in revenue over the regulatory lifetime through 2034 for local agencies and school districts. The cost accounts for the incremental costs associated with the new vehicles purchased by local agencies during the regulatory lifetime, while the revenue accounts for the share of State sales tax revenue the local government will receive for all affected new vehicles sold in California during the regulatory lifetime. However, the Board finds that that these costs are not reimbursable pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code, because the additional costs associated with the proposed amendments apply generally to all entities that purchase affected engines and vehicles, private fleets, and owners as well as State and local agencies. The proposed amendments do not mandate a new program or higher level of service on any local government.

B. Consideration of Alternatives

For the reasons set forth in the staff report, in staff's comments and responses at the hearing, and in this 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 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.

Staff considered the following two alternatives to the proposed amendments: (1) adopting no amendments, and (2) adopting more stringent amendments.

1. Adopting No Amendments Alternative

Compared to the baseline, this alternative would result in no additional costs to manufacturers or increase in vehicle purchase price for California businesses and individuals who purchase new light-, medium-, and heavy-duty vehicles. Compared to the proposed amendments, this alternative would result in a cost savings to businesses and individuals who purchase new light-, medium-, and heavy-duty vehicles in California of $21.01 million over six years, or $1.10 (when purchasing from large manufacturers) and $19.25 (when purchasing from small manufacturers) per light- or medium-duty vehicle and $29.68 (when purchasing from large manufacturers) and $70.19 (when purchasing from small manufacturers) per heavy-duty vehicle if manufacturers were able to pass on all costs and markup.

However, this alternative could prevent California from realizing all of the emission benefits projected for the light-, medium-, and heavy-duty vehicle programs. This could result in higher than anticipated emissions from malfunctioning vehicles which would lead to adverse health impacts for individuals in California and make it more difficult for the State of California to meet federal ambient air quality standards. Taking no action would also make it more difficult for manufacturers to comply with the existing OBD II and heavy-duty OBD (HD OBD) requirements and more difficult and time consuming for CARB to review and approve the OBD II and HD OBD system design on vehicles. This could require more staff resources

resulting in an additional fiscal impact. Staff rejected the no-action alternative because of the potential for adverse emissions impacts and lack of flexibility and clarity.

2. Adopting More Stringent Amendments Alternative

Staff also rejected the second alternative of more stringent amendments. Originally, CARB proposed adopting more stringent requirements for the OBD II and HD OBD amendments. For the in-use monitor performance ratio (IUMPR) requirements, CARB had proposed to report fault code specific IUMPR data for all OBD monitors. Manufacturers indicated that CARB's original proposal would require them to modify the IUMPR software for all fault codes, which would require excessive work load and cost for software design and implementation such as algorithm design, software engineering, component level software testing, calibration and validation testing.

To estimate the costs of this alternative, the same methodology and assumptions used to quantify costs for the proposed amendments were also applied here. This alternative would be more costly than the proposed amendments primarily due to the wider scope of the IUMPR requirements. For example, staff assumed 800 fault codes would be affected instead of 65 fault codes in the proposed amendments. In addition, the alternative doesn't include the supplemental monitor activity data for all fault codes as in the proposed amendments, which represents a significantly less costly approach to fulfill a similar goal. When considering these changes, the costs result in an incremental cost to consumers of $1.11 (when purchasing from large manufacturers) and $18.55 (when purchasing from small manufacturers) per light- or medium-duty vehicle and $31.10 (when purchasing from large manufacturers) and $71.29 (when purchasing from small manufacturers) per heavy-duty vehicle with all markups applied, and a total of $21.42 million over the 6-year lifetime for the proposed amendments. By comparison, the proposal's incremental cost to consumers is $1.10 (when purchasing from large manufacturers) and $19.25 (when purchasing from small manufacturers) per light- or medium-duty vehicle and $29.68 (when purchasing from large manufacturers) and $70.19 (when purchasing from small manufacturers) per heavy-duty vehicle, and the total incremental cost is $21.01 million. This represents a total savings of $0.41 million over the proposed amendments 6-year lifetime. In addition, this alternative does not have any additional emissions benefits compared to the proposed amendments, especially considering that the supplemental monitor activity data provides similar information to the traditional IUMPR. Therefore, considering its higher cost and perceived no additional benefits, staff rejected this more stringent alternative.

II. Modifications Made to the Original Proposal

A. Modifications Approved at the Board Hearing and Provided for in the 15-Day Comment Periods

Various modifications to the original proposal were made in order to address comments received during the 45-day public comment period, and to clarify the regulatory language. For the first 15-day notice, the substantive modifications include the following changes for both the OBD II and HD OBD regulations:

- Expanding the allowable negative response codes for vehicles/engines meeting the new Unified Diagnostic Services (UDS) requirements;

- Modifying the proposals regarding the cold start emission reduction strategy (CSERS) IUMPR, monitoring, and tracking requirements to clarify and enhance the requirements and address manufacturers' issues;
- Modifying the allowance to waive the proposed data submittal requirements for the diesel catalyst/adsorber aging protocols and monitor malfunction criteria to restrict the data waiver criteria to changes that do not affect the aging mechanism; and
- Requiring more information to be submitted in the testing results for production vehicle/engine evaluation testing and manufacturer self-testing to assist CARB staff in reviewing and addressing OBD system issues.

The substantive amendments in the first 15-day notice also include the following:

- Revising the deficiency provisions in the OBD II regulation to require manufacturers to pay deficiency fines according to a specific schedule and to extend the deadline to issue retroactive deficiencies;
- Revising the non-methane hydrocarbon (NMHC) catalyst and catalyzed particulate matter (PM) filter monitoring requirements for feedgas generation performance in the HD OBD regulation to align with those proposed for the OBD II regulation;
- Including provisions in the HD OBD regulation to allow for certain 2025 and 2026 model year "legacy engines" to meet the 2023 model year OBD requirements to align with recent amendments adopted for the Heavy-Duty Omnibus rulemaking; and
- Revising the OBD II and HD OBD enforcement provisions to exempt vehicles with OBD-related recalls that involve only software changes from the recall labeling requirements and to correct the mailing address where manufacturers are required to send their remedial action information.

Pursuant to the Board direction provided in Resolution 21-15, CARB released the first 15-day notice on February 15, 2022, which placed documents into the regulatory record and presented the additional modifications to the regulatory text.[1] Subsequently, staff made further modifications to add language that were mistakenly left out that would allow manufacturers to use alternate phase-in schedules for the diesel CSERS trackers, correct errors in the regulation language for production vehicle/engine evaluation testing, modify an example in the certification documentation requirements, and clarify the deficiency fines requirements and the definition of "start of production." CARB released the second 15-day notice on April 22, 2022, which presented these additional modifications to the regulatory text.[2] Both 15-day notices described each substantive modification to the original proposal and the rationale for the modifications.

B. Non-Substantial Modifications

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

[1] California Air Resources Board. Notice of Public Availability of Modified Text and Availability of Additional Documents. Posted February 15, 2022. Available online at: *https://ww2.arb.ca.gov/rulemaking/2021/obd2021*.
[2] California Air Resources Board. Second Notice of Public Availability of Modified Text. Posted April 22, 2022. Available online at: *https://ww2.arb.ca.gov/rulemaking/2021/obd2021*.

- Section 1968.2(c): In the definition of "FTP cycle," "Appendix 1" was corrected to "Appendix I" using a roman numeral for the numbering;
- Section 1968.2(e)(3.4.1): The section number for "Confirmed fault codes" was corrected from (A) to (B) to fix a formatting error so that the section number will be consistent with what is currently in the California Code of Regulations;
- Section 1968.2(f): In Table 3 at the beginning of section 1968.2(f), the reference to section (h)(2.1.1) in footnote 5 was corrected to (h)(2.2.1) and the reference to (d)(3.2.1)(F)(vi) was corrected to (d)(3.2.1)(G)(vi), since sections (h)(2.1.1) and (d)(3.2.1)(F)(vi) do not exist. Further, Table 3 and footnote 5, sections 1968.2(d)(3.2.1)(G)(vi), and 1968.2(h)(2.2.1) all refer to requirements specifically related to Option 2 for the PM filter filtering performance monitor, so sections 1968.2(d)(3.2.1)(G)(vi) and 1968.2(h)(2.2.1) are clearly the correct sections to reference;
- Section 1968.2(f)(9.2.4)(B)(ii)b: Deleted a comma at the end of the sentence;
- Sections 1968.2(h)(2.2.1) and (k)(7.3): The references to section (d)(3.2.1)(F)(vi) were corrected to (d)(3.2.1)(G)(vi), since section (d)(3.2.1)(F)(vi) does not exist. Further, sections 1968.2(d)(3.2.1)(G)(vi), 1968.2(h)(2.2.1), and 1968.2(k)(7.3) all refer to requirements specifically related to Option 2 for the PM filter filtering performance monitor, so section 1968.2(d)(3.2.1)(G)(vi) is clearly the correct section to reference;
- Section 1968.5(b)(6)(B)(ii)c.: Corrected the numberings of sections (b)(6)(B)(ii)c.2 through 3 to (b)(6)(B)(ii)c.3 through 4;
- Section 1971.1(e)(9.3.1): Corrected the numberings of sections (e)(9.3.1)(A) and (B) to (e)(9.3.1)(A)(i) and (ii);
- Section 1971.1(e)(11.2.3)(B)(i): Deleted an unnecessary "and";
- Section 1971.1(h)(3.1): Corrected the numberings of sections (h)(3.1.2) and (h)(3.1.3) to (h)(3.1.1) and (h)(3.1.2), respectively, since there previously was no section (h)(3.1.1);
- Section 1971.1(h)(5.9.5)(C): Added a period at the end of the sentence; and
- Section 1971.5(c)(6)(A): Corrected the numberings of sections (c)(6)(A)(ix) through (xiii) to (c)(6)(A)(x) through (xiv).

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 regulation and the incorporated documents adopted by the Executive Officer incorporate by reference the following documents:

- SAE International (SAE) J1979-DA, "Digital Annex of E/E Diagnostic Test Modes," April 2021; sections 1968.2(g)(1.4.1) and 1971.1(h)(1.4.1);
- SAE J1979-2 – "E/E Diagnostic Test Modes: OBDonUDS," April 2021; sections 1968.2(g)(1.14) and 1971.1(h)(1.13);
- Data Record Reporting Procedures for Over-the-Air Reprogrammed Vehicles and Engines Using SAE J1979-2, December 15, 2021; sections 1968.2(g)(8.1.1) and 1971.1(h)(6.1.1);
- 40 Code of Federal Regulations (CFR) 86.082-2, as it existed on January 25, 2018; section 1968.2(c);
- 40 CFR 86.094-2, as it existed on January 25, 2018; section 1968.2(c);

- 40 CFR 86, Appendix I, section (a), as it existed on July 8, 2019; section 1968.2(c);
- 40 CFR 86, Appendix I, section (f)(1), as it existed on January 25, 2018; section 1968.2(c); and
- 40 CFR 86, Appendix I, section (f)(2), as it existed on January 25, 2018; section 1968.2(c).

These documents were incorporated by reference because it would be cumbersome, unduly expensive, and otherwise impractical to publish them in the 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 CARB 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. The documents from SAE are copyrighted and are available only for purchase on the organization's website.[3]

IV. Summary of Comments and Agency Response

Written comments were received during the 45-day comment period in response to the July 22, 2021 public hearing notice, and written and oral comments were presented at the Board Hearing. Written comments were also received during the first 15-day comment period in response to the February 15, 2022 public notice. No written comments were received during the second 15-day comment period in response to the April 22, 2022 public notice.

Listed below are the organizations and individuals that provided comments during the 45-day comment period, at the board hearing, and during the first 15-day comment period:

[3] Copies of SAE documents are available through the SAE at *http://www.sae.org* .

Table 1. Written Comments Received During the 45-Day Comment Period

Commenter, Date	Affiliation
Douglas, Steve (July 19, 2021)	Alliance for Automotive Innovation (AAI)
French, Timothy A. (July 19, 2021)	Truck & Engine Manufacturers Association (EMA)
Lee, Alice (July 19, 2021)	American Honda Motor Co., Inc. (Honda)
Chance, Barbara (July 19, 2021)	Allison Transmission, Inc. (Allison)
Brezny, Rasto (July 19, 2021)	Manufacturers of Emission Controls Association (MECA)
Young, Ventura (July 14, 2021)	Private Citizen

Table 2. Oral Comments Presented at the Board Hearing

Commenter, Date	Affiliation
Sutton, Tia	EMA
Gellar, Mike	MECA
Douglas, Steve	AAI

Listed below are the organizations and individuals that provided comments during the first 15-day comment period:

Table 3. Written Comments Received During the First 15-Day Comment Period

Commenter, Date	Affiliation
Nazareth, Veronica (February 18, 2022)	Private Citizen
Douglas, Steve (March 2, 2022)	AAI
Curley, Kevin (March 2, 2022)	Mazda North America Operations (Mazda)
Sutton Sysounthorn, Tia (March 2, 2022	EMA

Two comments (from private citizens) were not relevant to the publicly noticed amendments for this OBD rulemaking update, and therefore were not summarized below and not responded to

as they were beyond the scope of the rulemaking and therefore, CARB is not required to respond.

As mentioned above, no comments were received during the second 15-day comment period.

A. 45-Day Comments and Public Hearing Oral Comments

i. General Comments

1. Comment: We support the UDS and CSERS amendments and the amendment requiring a standardized function enabling generic scan tools to seal the evaporative system. (MECA)

   Agency Response: CARB staff made no changes based on the received comment. CARB staff appreciates the comment.

2. Comments: EMA strongly supports the comments of the Alliance of Automotive Innovation, including the CSERS regulation changes requested by the United States Council for Automotive Research (USCAR). (EMA)

   Agency Response: CARB staff made no changes based on the received comment. CARB staff acknowledges the comment.

3. Comment: The proposed gasoline engine stall monitor, diesel CSERS catalyst warm-up system monitor, and CSERS tracking requirements (sections 1968.2(e)(15.2.2), 1968.2(f)(12.2.4), 1968.2(g)(6.14.5), 1971.1(g)(3.2.2)(B)c.2., 1971.1(e)(11.2.4), and 1971.1(h)(5.9.7)) allow for alternate phase-in schedules but requires 100 percent in the 2028 model year rather than using the "alternative phase-in" definition in sections 1968.2(c) and 1971.1(c). Using unique phase-ins for each requirement in the regulation unnecessarily increases complexity. While this is done in some cases where inspection and maintenance (I/M) stations could be confused by phase-ins, this does not appear to be the case, so there's no reason for these special phase-ins. The existing definition of "alternative phase-in" should be used instead of these special phase-ins. (AAI)

4. Comment: The proposed phase-in schedules for the requirements in sections 1971.1(e)(11.2.4), 1971.1(g)(3.2.2)(B)(i)c.2., and 1971.1(h)(5.9.7), as well as the allowance to use an alternate phase-in but with 100 percent compliance in the 2028 model year, are not needed since they would cause unnecessary burdens in the final year of production when manufacturers would need to make major changes for a small volume of product. (EMA)

   Agency Response to Comments 3-4: CARB staff made no changes based on the received comments and respectfully disagrees with the commenters. CARB staff believes that 100 percent compliance by the 2028 model year is enough lead time for manufacturers to fully meet these requirements across their product lines. Further, CARB staff had originally proposed the phase-in schedules to start a year earlier (i.e., the 2025 model year) than the noticed proposal, which would result in 100 percent implementation of the requirement by the 2028 model year at the latest and would have been consistent with the amount of lead time provided in previous OBD rulemaking updates for new requirements. CARB believes these requirements should be implemented as soon as technically possible. However, CARB staff delayed the start date of the required phase-in schedules to 2026 at

the request of manufacturers who indicated they needed more time and the 2025 start date was too soon, but staff kept the 100 percent implementation date of 2028 to ensure faster implementation of the requirements, especially considering the later start date. One commenter indicated that other cases in the OBD regulation that use unique phase-in schedules were done to avoid confusion by I/M stations. The other OBD II requirements that provided similar unique phase-in schedules were the initial implementation of IUMPR and new requirements for the diagnostic connectors. The commenter's assertion is not correct. CARB utilizes unique 100 percent implementation phase-in for reasons other than to accommodate I/M stations, such as establishing a known baseline (i.e., a defined start date) for compliance with a requirement for enforcement purposes or because the improvements to OBD system performance or enforceability are needed for a robust OBD program. While diagnostic connectors are important in I/M inspections, the unique phase-in for IUMPR data was not required to assist I/M stations, since IUMPR data are not used by I/M stations at all when determining if vehicles passed or failed inspections; rather, IUMPR data were important for real-world OBD system performance and enforceability of the OBD requirements.

ii. General Requirements

5. Comment: For sections 1968.2(d)(2.2.7) and 1971.1(d)(2.2.1)(D)(ii), the language for the freeze frame requirements for SAE J1979-2 should be revised to use "most recent frame" instead of "second frame" to avoid confusion and more closely align with SAE J1979-2. (AAI)

   Agency Response: CARB staff made no changes based on the received comment. CARB disagrees with the commenter. Since the phrase "first frame" is also used in the regulation, staff believes "second frame" is the more appropriate wording to use even though it may not align with the SAE J1979-2 phrase of "latest occurrence". The reason for not aligning with SAE J1979-2 is that staff believes using "latest occurrence" may cause confusion, especially since both the "first frame" and the "second frame" are stored at the same time in conjunction with storage of the pending fault code.

6. Comment: For the new CSERS system level and feature/component monitors, there are some disconnects in the numerators that should be updated to prevent inaccurate IUMPR. Section 1968.2(d)(4.3.2)(N) should be updated to add feature/component monitors (sections (e)(11.2.4) and (f)(12.2.3)), and existing section 1968.2(d)(4.3.2)(E)(ii) should be updated to point to the correct regulation sections, specifically changing "(e)(11) and (f)(12)" to "(e)(11.2.2) and (f)(12.2.1)." The denominator for the gasoline CSERS warm-up monitor should only be incremented if the CSERS cold start criteria are met AND there is a 10 second idle during the first 30 seconds after engine start (recommend to add as section 1968.2(d)(4.3.2)(O)). (AAI)

   Agency Response: CARB staff made changes based on the received comment. CARB staff agrees with the commenter and proposed these changes in the OBD II regulation as well as similar changes in the HD OBD regulation as part of the first 15-day notice.

7. Comment: Sections 1968.2(d)(5.1.3), 1986.2(d)(5.1.4), 1971.1(d)(5.1.3), and 1971.1(d)(5.1.4) requires reporting of the general denominator and ignition cycle counter

for J1979-2. Discussion is needed in the J1979 meeting about if we should report a short length of F808/F80B parameters with only these two items. (AAI)

Agency Response: CARB staff made no changes based on the received comment. Manufacturers will need to report a short length of F808/F80B parameters with only the general denominator and ignition cycle counter until another solution is determined by CARB and SAE 1979 committee in the future to address this, at which point, CARB may amend the regulations if changes are needed.

8. Comment: Section 1968.2(d)(5.7.1)(B)(ii) and 1968.2(d)(5.7.2)(B)(ii) indicate the mini-numerator and mini-denominator are required to be incremented at the end of the driving cycle, while SAE J1979-DA (April 2021) indicates the mini-numerator increments when the monitor reports a pass and indicates the mini-denominator increments when the general denominator increments. (AAI)

   Agency Response: CARB staff made no changes based on the received comment. CARB staff appreciates this comment. The differences in language between CARB's language and SAE J1979-DA should not cause any difference in how manufacturers implement the monitor activity tracking parameters. As explained by industry in multiple meetings with CARB staff during the development of the monitor activity portion of the SAE J1979-DA, the basic idea is that the diagnostic event manager of the OBD system would wait until the end of a driving cycle when it had a complete view of what transpired during that cycle to determine if the mini-numerator and mini-denominator should be incremented. If a monitor reported that it ran and passed during the driving cycle and no faults were identified, the mini-numerator would be incremented at the end of the cycle. If the general denominator was incremented during the driving cycle and no faults were identified, the mini-denominator would be incremented at the end of the cycle.

   The commenter is correct that the April 2021 version of SAE J1979-DA does not explicitly say that the incrementation must occur at the end of the driving cycle, but it is not logical to do so at any other time, such as mid-cycle, because a fault could still be detected by a monitor after the incrementation occurred. This would violate the requirement (sections 1968.2(d)(5.7.1)(B)(iii) and 1971.1(d)(5.7.1)(B)(iii)), which is strongly supported by industry, that incrementation be paused for driving cycles in which a fault has been identified by the OBD system. As such, manufacturers must increment these parameters consistent with the regulation and the April 2021 version of SAE J1979-DA. Another aspect pointed out by the commenter is that, unlike the regulation, the SAE J1979-DA indicates that the monitor must report a pass decision for the mini-numerator to be incremented. However, this is effectively the same as the regulation's requirement that no incrementation should occur if a fault is detected and a pending fault code is stored, i.e., only a pass decision can result in the incrementation of the mini-numerator. Staff would also like to point out that a draft revision to the SAE J1979-DA, that will be included with the next ballot of the document according to the governing SAE committee, will revise the relevant language to be more clearly consistency with the applicable regulatory language.

9. Comment: The proposal in section 1971.1(d)(5.7) requiring the OBD system to track and report the supplemental monitor activity data (SMAD) "for each diagnostic or emission-critical powertrain control unit" should either exclude transmission control modules (TCM) or be limited to input rationality fault and output functional checks in the TCM (similar to

the readiness requirements). Transmission sensors and actuators are comprehensive component and typically not used in other diagnostics. The vast majority of their diagnostics run continuously, where the enable conditions are designed to run the diagnostics as much as possible during real world driving conditions. Adding SMAD is impractical for a TCM since it adds more software implementation complexity with no air quality or repair effectiveness/efficiency benefits, does not improve diagnostic time/service efficiency for service technicians or vehicle end users debugging issues, and will require new software, calibration development, and validation testing for every transmission diagnostic, when the work could be focused elsewhere in the continuing development of Allison emissions reduction technology. (Allison)

Agency Response: CARB staff made no changes based on the received comment. CARB staff disagrees with the commenter. The proposed SMAD requirements only apply to the fault codes supported by a diagnostic or emission-critical powertrain control unit that can illuminate the malfunction indicator light (MIL), not all diagnostics that the control unit happens to support. Diagnostics that can illuminate the MIL are part of the OBD system that is certified by CARB, and as such, it is valuable to have information on their actual performance in the field regardless of which control unit they are associated with.

iii. Monitoring Requirements

10. Comments: For sections 1968.2(e)(11.1.3), 1971.1(f)(12.1.2), 1971.1(e)(11.1.2), and 1971.1(f)(4.1.2), which require different diagnostics to distinguish CSERS faults, the regulations should be changed to allow manufacturers to use "similar conditions" or unique diagnostic trouble codes (DTC) to cover "different diagnostics." (AAI)(EMA)

    Agency Response: CARB staff made no changes based on the received comment. CARB disagrees with the commenters. A unique fault code for CSERS diagnostics has been required for many years and is designed to clearly identify cold start malfunctions. The proposed regulation does not dictate software logic and would allow manufacturers to use a common monitor with "similar conditions" to meet the requirement of "different monitors." However, the commenter's proposal to allow use of a common fault code, which would rely on freeze frame data to identify if the fault is occurring during cold start, weakens the purpose of the regulation requirements by removing the clear and obvious indication provided by a unique fault code that the fault is a cold start malfunction. CARB staff believes that the proposed regulation language is sufficient to allow manufacturers the freedom they are requesting with "similar conditions," but requiring the use of a unique fault code preserves the purpose of the regulation requirements. Therefore, no change is needed.

11. Comment: For section 1968.2(e)(11.2.3)(A)(i), industry is concerned about false failures related to the constant threshold for the CSERS monitor. Individual companies have held one-on-one discussions with CARB staff about this. (AAI)

12. Comment: There is concern related to varying conditions and uses that customer vehicles encounter which the CSERS system design must account for. The fixed malfunction criteria is likely to result in false failure detections, causing inconvenience to customers and poor perception of the OBD program. To maintain the fixed malfunction criteria and avoid false failures, the CSERS system needs time for significant development. Since more

development is needed than expected, the start date of 2026 model year for 100 percent of vehicles is really challenging, and should be changed to a phase-in of 20 percent for 2026 model year, 50 percent for 2027 model year, and 100 percent for 2028 model year vehicles to match the phase-in period for the engine stall monitor in section 1968.2(e)(15.2.2)(B)(iii). (Honda)

Agency Response to Comments 11-12: CARB staff made changes based on the received comments. CARB understands the commenters' concerns about false failures, and therefore proposed changes as part of the first 15-day notice that would allow manufacturers to use variable malfunction thresholds based on the ambient air temperature. CARB also proposed changes as part of the first 15-day notice that would change the required implementation date for the cold start catalyst heating monitor to a phase-in schedule: 20 percent of 2026, 50 percent of 2027, and 100 percent of 2028 model year vehicles/engines.

13. Comment: Page 41 of the staff report indicated that for the demonstration to be exempt from the cold start catalyst heating monitor requirements, vehicles and engines that use electrically heated catalysts in addition to accelerated catalyst heating based on engine operating conditions would be expected to monitor the electrically heated catalyst as required in the regulation and not disable the electrical heating for the demonstration. This statement has good foresight to envision a possible case where both methods are used, and should be put directly into the regulation. Specifically for section 1968.2(e)(11.2.3)(D), the language "For purposes of meeting the requirements for exemption demonstration in section (e)(11.2.3)(C)(i) above, vehicles and engines that utilize both electrically heated catalysts monitored per the monitoring requirements for electrically heated catalysts in section (e)(2) and accelerated catalyst heating based on engine operating conditions would not be expected to disable the electrical heating for the exemption demonstration." (AAI)

    Agency Response: CARB staff made changes based on the received comment. Though CARB does not agree with the exact language the commenter proposed, since the proposed commenter's wording "would not be expected" is not clear. However, CARB agrees with including language that mention these catalysts and proposed regulation language accordingly in both the OBD II and HD OBD regulations as part of the first 15-day notice. Specifically, CARB added language indicating that on vehicles that utilize both electrically heated catalysts that are monitored and accelerated catalyst heating based on engine operating conditions, the manufacturer is not required to disable the electrically heated catalyst during the testing required for monitoring exemption, but the manufacturer may not increase electric heating beyond the levels of a properly functioning emission control system.

14. Comment: If the proposed amendment in section 1971.1(g)(3.2.2)(B)(i)c.2. is finalized, section 1971.1(g)(3.2.2)(B)(i) should be modified to "when any of the following conditions occur." (EMA)

    Agency Response: CARB staff made changes based on the received comment. Staff agrees that the language in section 1971.1(g)(3.2.2)(B)(i) should be modified to change "either" to "any" and proposed the change as part of the first 15-day notice.

15. Comment: For the engine stall monitor in section 1968.2(e)(15.2.2)(B)(iii), there is currently no exemption from the monitoring requirements for idle stop equipped vehicles that may intentionally shut down the engine to 0 revolutions-per-minute (rpm). (AAI)

    Agency Response: CARB staff made changes based on the received comment. CARB staff agrees that there should be regulation language to exempt these cases from malfunction detection, and proposed changes as part of the first 15-day notice to exclude from the definition of "engine stalls" cases where the vehicle/engine purposely commands the engine to shut off on vehicles that employ engine shutoff strategies (e.g., hybrid vehicles, vehicles with a start-stop system that shut off the engine idle).

16. Comment: The stall monitor section (section 1968.2(e)(15.2.2)(B)) has ambiguous language about whether fuel level information must be considered for the monitor enablement. We understood from previous discussions with CARB that it is okay to disable the monitor at low fuel levels. To make clear that the fuel level does not have to be monitored for enablement, the section should be revised to delete the language "when fuel level is 15 percent or more of the nominal capacity of the fuel tank" from (e)(15.2.2)(B)(iii) and add section (e)(15.2.2)(B)(iii)c. stating "No monitoring is required when fuel level is 15 percent or more of the nominal capacity of the fuel tank." (AAI)

    Agency Response: CARB staff made changes based on the received comment. The intent of CARB's proposed language matches with the commenter's understanding – the engine stall monitor is not required to run and detect malfunctions when the fuel level is low. Therefore, CARB proposed the changes that the commenter suggested as part of the first 15-day notice. As a note, the 45-day comment had an error - the commenter's proposed language should read "when fuel level is 15 percent or less," not "when fuel level is 15 percent or more."

17. Comment: In Table 3 of section 1968.2(f), the Option 1 of the Passenger Cars row should say "2026-2028: 17.5, 2029+MY: 10.00, and the 2019+MY Chassis Certified MDVs row should say "Up to and including 2018MY: 17:50, 2029+MY: 14.00." (AAI)

    Agency Response: CARB staff made changes based on the received comment. CARB staff agrees with the commenter and made the changes as part of the first 15-day notice.

18. Comment: In the staff report, the text "the proposed PM threshold of 10.00 mg/mi was set based on the capability of improved PM sensor technology" should say "potential" before improved because there is no existing commercialized/industrialized improved PM sensor technology. There is a technology company with intellectual property (IP) and prototypes, but currently no Tier 1 supplier to industrialize. This is a gross overstatement by CARB and a downplaying of the challenge to bring this new technology to market. (AAI)

    Agency Response: CARB staff made no changes based on the received comment. CARB staff disagrees with the comment concerning the staff report text being "a gross overstatement" and "a downplaying of the challenge to bring this new technology to market." CARB staff had reviewed the information, publications, and other data regarding the possible future PM thresholds, and worked closely with manufacturers to fully understand what is feasible. In the staff report, CARB staff had estimated the PM threshold could be low as 4 milligrams per mile (mg/mi) based on the published data.

Balanced on expected PM sensor technical feasibilities and the uncertainties of implementation of new PM sensor technology, CARB staff proposed a reasonable PM threshold of 10 mg/mi. Besides the company with IP and prototypes mentioned in this comment, there is another company that had a new product that could possibly achieve the 10 mg/mi threshold. CARB staff is actively tracking new PM sensor technologies and products.

19. Comment: The introductory text in sections 1971.1(e)(5.2.4)(B)(ii) and 1971.1(e)(6.2.3)(B)(ii) should be modified to start with "Information and data collected on an engine dynamometer or a reactor bench…" (EMA)

    Agency Response: CARB staff made no changes based on the received comment. The purpose of this requirement is to allow CARB staff to review data from field-returned parts and compare their performance with those of laboratory-aged parts. CARB staff did not add the suggested language since the language would limit the comparison to those of laboratory parts versus other laboratory parts, which is not the intent of the requirement.

20. Comment: The amendments to the catalyst malfunction criteria regarding field-returned parts are unworkable as proposed. Though improved understanding of accelerated aging versus real world experience is a highly desired goal, field returns of approximate best performing unacceptable parts likely will not appear before 750,000 miles on heavy-duty vehicles, which would take 5 years (at an average of 150,000 miles per year). Comparing a 5-year-old field returned part with an aged part of the same design will not reliably correlate with an accelerated aged part of a new design, since the new design with will be materially different due to changes in useful life and threshold requirements. (EMA)

    Agency Response: CARB staff made no changes based on the received comment. Staff already proposed language to address these concerns. For example, for diesel NMHC catalysts in section 1971.1(e)(5.2.4)(B)(i), staff included language allowing manufacturers to submit the required data for new emission control system designs after certification of the OBD system if the manufacturer does not have sufficient in-use aging data at the time of OBD certification. Further, for diesel NMHC catalysts in section 1971.1(e)(5.2.4)(B)(iii), staff provided language allowing manufacturers to include additional catalysts if the catalyst in a specific category is not available. The proposed language for diesel oxides of nitrogen (NOx) catalysts and NOx adsorbers have similar language. For new designs or component modifications, the proposed regulation language would allow manufacturers to propose that the component or system is adequately represented by existing aging plans and correlations - new aging correlation data would only be required if the new or modified parts are substantially different from existing designs such that the aging mechanisms have changed. If the new or modified parts are substantially different, manufacturers would be required to propose a new aging and monitoring plan and submit data and information supporting the plan to CARB using the provisions and timelines provided in the proposed regulation. Manufacturers could provide research and fleet data to support their plan and meet certification timelines while in-use aging correlation data can be provided after certification.

21. Comment: For the carryover provisions for the proposed diesel NMHC catalyst, NOx catalyst, and NOx adsorber aging and best performing unacceptable (BPU) correlation

requirements (section1968.2(f)(1.2.4)(C), 1968.2(f)(2.2.4)(C), 1968.2(f)(8.2.6), 1971.1(e)(5.2.4), 1971.1(e)(6.2.3), and 1971.1(e)(7.2.6)), "substantially in strategy or architecture" should be added to the language (e.g., "the calibration and hardware of the NMHC catalyst monitor, the engine, and the emission control system for the current model year have not changed substantially in strategy or architecture from the previous model year." (AAI)

22. Comment: The language in sections 1971.1(e)(5.2.4)(C) and 1971.1(e)(6.2.3)(C) should be modified to state "if the plan and data have been submitted for a previous model year and are substantially similar with respect to catalyst aging mechanisms." (EMA)

23. Comment: It is unlikely that all calibrations and hardware will remain unchanged from model year to model year. Calibration changes and most hardware changes (except for major technology changes) are unlikely to affect catalyst aging mechanisms in the field. The 45-day language disincentivizes continuous improvement/warranty reduction efforts due to the extensive costs of conducting a correlation effort. (AAI)(EMA)

    Agency Response to Comments 21-23: S CARB staff made changes based on the received comments. Staff agrees that changes should be made to the regulation language to address this, and proposed changes as part of the first 15-day notice that would allow manufacturers to be exempt from the requirements of the sections cited, if, among other things, the calibrations and hardware have not changed to the extent aging mechanisms are affected from the previous model year.

24. Comment: Section 1968.2(f)(8.2.6) should be moved to 1968.2(f)(8.2.5)(C) like the NMHC catalyst and NOx catalyst sections. (AAI)

    Agency Response: CARB staff made changes based on the received comment. CARB staff proposed changes in the first 15-day notice to restructure the NOx adsorber section in 1968.2(f)(8.2.4) to be more like the comparable requirements in the NMHC catalyst and NOx catalyst sections. This included renumbering section 1968.2(f)(8.2.6) to 1968.2(f)(8.2.4)(C).

25. Comment: For the NOx sensor "gap" monitoring requirements, the statement "(except the data point at the sensor monitor malfunction threshold)" needs to be added to sections 1968.2(f)(5.2.2)(D)(i)c. and 1971.1(e)(9.2.2)(D)(i)c. (AAI)(EMA)

    Agency Response: CARB staff made changes based on the received comment. CARB staff agrees with the commenter and made the changes as part of the first 15-day notice.

26. Comment: The staff report does not include an acknowledgment of the relief for dual selective catalytic reduction (SCR) NOx sensors for the NOx sensor "gap" monitor data submission requirements (sections 1968.2(f)(5.2.2)(D) and 1971.1(e)(9.2.2)), which CARB agreed to include. (AAI)

27. Comment: In previous discussions and workshops, CARB indicated that relief for dual SCR NOx sensors 2 and 3 would be proposed in the staff report, but this provision does not appear in either section 1968.2 or 1971.1. (EMA)

Agency Response to Comment 26-27: CARB staff made changes to the ISOR based on the received comment. Staff mistakenly did not include this discussion in the staff report, and therefore added such language in Attachment D, "Addendum to the Initial Statement of Reasons for the Public Hearing to Consider the Proposed Revisions to the On-Board Diagnostic System Requirements and Associated Enforcement Provisions for Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles and Engines, and Heavy-Duty Engines," of the first 15-day notice. Staff, however, did not propose language in sections 1968.2 and 1971.1 accounting for this relief since the requirement includes the current language that already states monitoring is required "to the extent feasible," meaning manufacturers are required to comply with the requirement to the full extent that the current technology allows, which should take into account dual SCR systems.

28. Comment: Update the HD OBD regulation (sections 1971.1(e)(5.2.3)(B) and 1971.1(e)(8.2.4)(B)) to align the diesel oxidation catalyst (DOC) and PM filter feedgas generation requirements with those in the OBD II regulation (sections 1968.2(f)(1.2.3)(B) and 1968.2(f)(9.2.4)(B)). (AAI)(EMA)

    Agency Response: CARB staff made changes based on the received comment. CARB staff agrees with the commenters and made the changes as part of the first 15-day notice.

29. Comment: The staff report should replace "complete deterioration" with "net zero feedgas" (what's coming into versus coming out of) in the feedgas monitoring discussion. (AAI)

    Agency Response: CARB staff made changes based on the received comment. CARB staff agrees with the commenter, and made changes to the staff report language (which was included as an attachment to the first 15-day notice) to replace the phrase "complete deterioration" with "net zero feedgas."

30. Comment: CARB should revise the PM filter monitor IUMPR and threshold provisions by maintaining the current IUMPR standards and including future increases in the PM threshold stringency. CARB should also work with original equipment manufacturers (OEM) that have challenges meeting these requirements through the already available process of granting deficiencies during certification, which will allow OEMs three years to fix any monitor deficiencies and provide time for sensor suppliers to work with their customers to meet their monitoring needs.

    Staff's proposal to lower the threshold from 17.5 to 10 mg/mi for 2028 model year light-duty vehicles will effectively result in a decrease in threshold stringency because the PM standard fully phases in from 3 to 1 mg/mi by 2028, so the ratio of the threshold to the standard will increase from 5.8 to 10.

    Sensor technology commercialization has a long cycle, including testing, design and real world deployment across many trucks in the field to ensure sensors are reliable and durable, which is why stringent and predictable standards are an important signal to industry to make investments today for technologies that will be needed in the future. Subsequently reversing adopted standards leaves technology and investments stranded and creates a level of uncertainty in the need for technology innovation. Several advancements of PM sensor technology have been demonstrated since the last OBD regulatory update, with some work completed (unpublished data) as part of the ongoing

Particle Sensor Performance and Durability Consortium being managed by Southwest Research Institute. A 2020 study highlights the potential of PM sensors to yield more data and greater sensitivity measurement as low as 1 mg/meter^3. At the current IUMPR and thresholds being proposed, these technologies are not likely to be needed for compliance. (MECA)

Agency Response: CARB staff made no changes based on the received comment. Staff provided rationale for the proposed thresholds and IUMPR requirements in the staff report. Staff believes the original assessment and proposal still provide the appropriate balance and therefore, staff did not make changes based on the comments. However, CARB staff intends to revisit these requirements in the future, and if data show that PM sensors have improved such that more stringent PM thresholds are feasible, CARB will propose amendments to lower the PM thresholds and/or revise the IUMPR at a future OBD rulemaking update.

31. Comment: The proposed CSERS catalyst warm-up strategy (CWS) monitor in section 1971.1(e)(11.2.2) seems to not take into account the alternate malfunction criteria that changed as part of the HD Omnibus rulemaking. CARB staff should review the changes to ensure there are no regulatory conflicts. (EMA)

    Agency Response: CARB staff made no changes based on the received comment. Section 1971.1(e)(11.2.2)(B) exempts monitoring of the CWS if no malfunction can cause emissions to exceed 1.5 times the applicable NMHC and carbon monoxide (CO) standards, 0.3 grams per brake horsepower-hour (g/bhp-hr) NOx, or 0.03 g/bhp-hr PM. The HD Omnibus provisions the commenter is referring to (sections 1971.1(g)(5.2.4)(C) and (D)) would allow monitoring exemption if no malfunction causes NOx and PM emissions to exceed certain levels based on the currently required "test-out" criteria. For example, if the currently required "test-out" criteria allow monitoring exemption if no malfunction causes NOx and PM emissions to exceed the applicable standards, the newly adopted HD Omnibus provisions allow manufacturers to be exempt from monitoring if no malfunction causes NOx emissions to exceed 0.20 g/bhp-hr and PM emissions to exceed 0.01 g/bhp-hr. Considering the NOx and PM emissions criteria in section 1971.1(e)(11.2.2)(B) are greater than those of the HD Omnibus provisions, meaning it would be harder for manufacturers to be exempt from CWS monitoring if similar "test-out" criteria as the HD Omnibus provisions were used, staff believes that no changes are needed to the "test-out" criteria in section 1971.1(e)(11.2.2) or the Omnibus provisions in sections 1971.1(g)(5.2.4)(C) and (D). Staff believes the proposed CWS monitor test-out criteria are appropriate for all emission standards, including engines certified to the Omnibus emission standards.

32. Comment: As previously recommended (see EPA-HQ-OAR-2011-0135-0437), the OBD leak detection should be reduced for pressurized sealed fuel systems (NIRCOS), and OBD staff should consider developing additional data necessary to support a proposed revision to a lower and technically feasible threshold that provides equivalent emissions from sealed tanks to those from conventional fuel tanks. Pressurized sealed tanks are being increasingly adopted on hybrids and plug-in hybrids, with all plug-in hybrids and 77 percent of hybrids using sealed tank systems (NIRCOS) based on U.S. national 2019 certification. Further, the number of hybrids and plug-in hybrids are expected to increase out to 2035. Data show any leak size greater than 0.002 inches in a sealed system will

generate emissions higher than an open system with a 0.02 inch leak, vented through the evaporative emission canister. Emissions are totally uncontrolled on sealed systems with leaks greater than 0.005 inches in diameter. It will be easier to pressurize the tank and find a 0.005 inch leak than a 0.02 inch leak at ambient pressure. So there is no technical reason that a 0.005 inch leak cannot be identified and repaired on a pressurized fuel system. (MECA)

Agency Response: CARB staff made no changes based on the received comment. At this time, staff has not received or reviewed sufficient data or information to reach a decision on whether or not the evaporative system leak thresholds should be modified. Staff intends to revisit this issue in a future OBD II rulemaking update.

iv. Standardization Requirements

33. Comment: SAE J1979 and SAE J1979-2 are "peers" and mutually exclusive for a given vehicle/engine. The regulation language should be changed to make section 1971.1(h)(1.4) indicate "SAE J1979 as defined in," and sections 1971.1(h)(1.4.1) listing the SAE J1979 standard, 1971.1(h)(1.4.2) listing the SAE J1979-DA, and 1971.1(h)(1.4.3) listing the SAE J1979-2 standard. (EMA)

    Agency Response: CARB staff made changes based on the received comment. Though CARB staff agrees with the commenter that changes are needed to distinguish the SAE standards, CARB believes the commenter's changes would be confusing since the phrase "SAE J1979 as defined in" does not distinguish SAE J1979 from SAE J1979-2. Therefore, staff proposed changes as part of the first 15-day notice that would move SAE J1979-2 to its own section (sections 1968.2(g)(1.14) and 1971.1(h)(1.13)) separate from SAE J1979.

34. Comment: SAE J1979-2 says "which DTC classes are applicable for a specific market, is a function of the market regulation." We understand that the U.S. will have class #1 definition, but we could not find anything in the 45-day language. We need to know which class is required in U.S. OBD. (AAI)

    Agency Response: CARB staff made no changes based on the received comment. The SAE J1979-DA indicates that class #1 is required for vehicles designed to meet sections 1968.2 and 1971.1.

35. Comment: Section 1968.2(g)(3.4.1)(A) states that "The OBD II system may respond to physical Service $14... request messages from a scan tool." It's not clear if "may" means it is optional or mandatory. For clarify, the language should be changed to add "At the manufacturer's discretion" to the beginning of the sentence. (AAI)

    Agency Response: CARB staff made no changes based on the received comment. Consistent with the plain meaning of the word "may," and as explained in the Staff Report, "may" means it is optional.

36. Comment: The 45-day regulation language (section 1968.2(g)(3.4.2)) does not allow negative response codes (NRC) except for Service $14 and Service $22 ITID$F8xx. Table 12 "Proper response from server/ecu on functional or physical requests for OBDonUDS ECUs" in SAE J1979-2 (April 2021) lists additional NRCs that are needed and should be allowed in the regulation. (AAI)

Agency Response: CARB staff made changes based on the received comment. Staff agreed with the commenter that more allowances for NRCs should be made, and proposed changes as part of the first 15-day notice that allowed for NRCs as listed in the SAE J1979-2 document with exceptions and/or clarifications noted.

37. Comment: Sections 1968.2(g)(4.1.2)(B)(xii) and (xxx) require readiness status for gasoline and diesel air conditioning (A/C) system component, but SAE J1979-2 (April 2021) does not define a readiness group identifier for these components, while Service $22 does not provide a readiness bit for these components. (AAI)

    Agency Response: CARB staff made changes based on the received comment. CARB mistakenly proposed these readiness requirements for the A/C system components, and therefore deleted these requirements as part of the first 15-day notice.

38. Comment: In the data stream requirements in sections 1968.2(g)(4.2.2)(F) and 1971.1(h)(4.2.4) for J1979-2, the data stream for "(iv) OBDonUDS Protocol Identification" (aka parameter identifier (PID) F810) needs to be added. (AAI)

    Agency Response: CARB staff made no changes based on the received comment. The SAE J1979-2 standard, which is incorporated by reference within, already defines the OBDonUDS protocol detection sequence and SAE J1979-DA already assigns the value $01 for PID $F810 to identify emissions-related engine control units that support SAE J1979-2 (i.e., OBDonUDS) services.

39. Comment: The regulation citation in section 1968.2(g)(4.3.2)(B) looks incorrect – "(g)(4.3.3)" should be "(g)(4.3.2)(C)." (AAI)

    Agency Response: CARB staff made changes based on the received comment. CARB proposed language to correct the error as part of the first 15-day notice.

40. Comment: Regarding evap system sealing, is 4.4.2(F)(iii) just intended to require support of the service $31 Routine response or is an additional PID being requested (which does not exist in J1979-DA)? (AAI)

    Agency Response: CARB staff made no changes based on the received comment. CARB is assuming the commenter is referring to section 1968.2(g)(4.2.2)(F)(iii) instead of 1968.2(g)(4.4.2)(F)(iii), since section 1968.2(g)(4.4.2)(F)(iii) does not exist. CARB's intent is to require an additional PID that identifies EVAP sealing status, as well as the EVAP sealing routine, which is documented in section 1968.2(g)(4.11.1).

41. Comment: Sections 1968.2(g)(4.4.6)(D)(ii) and 1968.2(g)(4.8.2)(B) should be modified to indicate "for J1979 Implementations." Also, for J1979-2, comprehensive component monitor readiness will no longer show always ready (similar to coordinated code clear). So the condition "other than the comprehensive components readiness bits" is not needed anymore (e.g., "in all control modules that reported supported readiness for a readiness bit 'other than the comprehensive components readiness bit'...") for sections 1968.2(g)(4.4.6)(D) and (g)(4.8.2)(B) for SAE J1979-2. (AAI)

    Agency Response: CARB staff made changes based on the received comment. CARB staff agrees with the commenter for the most part and made changes as part of the first 15-

day notice to reflect the suggested regulation changes. However, for vehicles using SAE J1979-2, staff proposed regulation language in the first 15-day notice that would further restrict the control modules required to reset to "not complete." Specifically, the regulation currently requires that when a control module is reprogrammed, any stored permanent fault code can be erased if the readiness bits are set to "not complete" in all modules except those supporting only the comprehensive component readiness bits. While staff generally agrees that control modules that support only comprehensive component readiness bits should no longer be excluded, staff determined that requiring the readiness bits in all control modules to set to "not complete" is not needed anymore. Instead, staff added section 1968.2(g)(4.4.6)(D)(iii) that would require the readiness bits for all monitored components and systems to set to "not complete" in only the module containing the permanent fault code.

42. Comment: For section 1968.2(g)(4.5.1), which specifies the display of test results in J1979-2 service $19 subfunction $06, it should say AND service $22 (or refer to the specifications). (AAI)

    Agency Response: CARB staff made no changes based on the received comment. CARB staff believes the suggested change is not needed since misfire counts in service $22 is already covered in the data stream requirements, so they are not needed in the test results. The reporting of misfire counts in the data stream using service $22 fulfill the new data stream reporting requirements in section 1968.2(g)(4.2.2)(F)(ii), while other test results will continue to be reported using service $19 subfunction $06.

43. Comment: The staff report (page 58) mentions modifications in section 1968.2(g)(6.6.3), which does not exist in the proposed regulatory language in Appendix A. This section should be related to the new requirements. This segment should be in relation to the new requirements in section 1968.2(g)(6.14) and state the information should be available via a generic scan tool, but the language should be clarified by adding something like "For each parameter specified in section (6.14.2), the parameters shall be made available to a generic scan tool in accordance with the SAE J1979 or SAE J1979-2 specifications, whichever is applicable." (AAI)

    Agency Response: CARB staff made changes based on the received comment. Section 1968.2(g)(6.6.3) was supposed to contain numerical value specifications for parameters specified in section 1968.2(g)(6.14) (i.e. the CSERS tracking parameters), which included requirements about when the data would be stored and when the data would be required to reset to zero if a scan tool command to clear fault codes is received, a non-volatile random access memory (NVRAM) reset occurs, or, if stored in keep alive memory, when keep alive memory is lost. While the staff report described these proposed requirements and the HD OBD regulation (section 1971.1(h)(5.9.5)) included these requirements as part of the 45-day notice, staff mistakenly did not include these requirements in the OBD II regulation. Therefore, staff proposed to include this section in the OBD II regulation as part of the first 15-day notice.

44. Comment: In section 1968.2(g)(6.12.3)(F), the regulation does not specify the start date for the change regarding requiring chassis certified medium-duty vehicles to output zero all the time for NOx tracking bin 15. The NOx tracking requirements in section

1968.2(g)(6.12.1) start in the 2022 model year, but this is a change and the 2022 model is already complete/certified. (AAI)

Agency Response: CARB staff made changes based on the received comment. CARB staff agrees that this amendment needs a later start date, and therefore proposed to start this new change for chassis certified medium-duty vehicles with the 2026 model year as part of the first 15-day notice.

45. Comment: Regarding section 1968.2(g)(6.12.4), which indicates that negative concentrations reported by the NOx sensor must be set to zero when calculating NOx mass data, this was discussed at length in the SAE J3349 Sensor Accuracy taskforce. The ultimate concern from industry is that exclusion of negative NOx sensor concentrations can have a significant impact on accuracy of cumulative NOx emissions for ultra-low NOx emissions systems (2024+ model year). (AAI)(EMA)

46. Comment: CARB should reconsider the amendment and allow for inclusion of negative NOx sensor concentrations. Investigations of negative NOx sensor readings have shown that such readings are meaningful, are an important contribution to measurement accuracy, are not artifacts, and are no more biased than any corollary positive readings. (EMA)

47. Comment: The Center for Alternative Fuels, Engines and Emissions (CAFEE) determined that discarding negative readings on some applications, line haul in particular, resulted in 10 percent higher perceived emissions with common modes of operation being the most effected. Phase 1 and 2 experiments by Cummins showed that one sensor type demonstrated close to nominal performance while the others tended to over-report when negative values were not truncated with the negative truncation making things worse in two thirds of the cases while being of minimal impact in the third case. Sensor to sensor variabilities explored in phase 1 laboratory investigations demonstrated how different data binning strategies can induce bias by excluding negatives. The magnitude of discrepancy between data processed by truncating negative values versus data in which the negatives were left intact in CAFEE's real world study was well within the discrepancies observed in the analogous Phase 1 laboratory investigations conducted by Cummins. (EMA)

Agency Response to Comments 45-47: CARB staff made no changes based on the received comments. Managing negative NOx concentration readings from NOx sensors may merit further consideration in future OBD updates. CARB staff will continue to look at additional relevant data as they become available. As stated in the staff report, staff agrees that setting all negative readings to zero could introduce a small positive bias in the NOx mass calculations, but includes this proposed method for now because of the lack of a strategy for managing negative NOx sensor readings that are not associated with symmetric positive deviations. Staff has observed that there are still poorly understood NOx sensor behaviors such as sustained periods of negative values which are neither associated with balanced positive deviations nor are they consistent offsets of the signal. Such behaviors could become more significant for future engines that have extremely low NOx emissions. Staff looks forward to furthering the common understanding of this topic with industry in the future.

48. Comment: Regarding the diesel CSERS trackers (sections 1968.2(g)(6.14) and 1971.1(h)(5.9)), NOx sensors (especially SCR downstream sensors) are not ready by the time catalyst light-off temperature is achieved, so the only way to determine NOx conversion efficiency and therefore 50 percent catalyst light-off temperature is to use FTIR analysis (i.e., during the Federal Test Procedure (FTP)). For the regulation language, the SCR light-off temperature ("catalyst light-off temperature") definition should refer to a "substantially warmed" SCR catalyst and use emission analyzers on the FTP cycle only, so it should specifically state the NOx conversion efficiency reaches 50 percent "first time measured by FTIR analyzers on an FTP75 cycle." "Engine output energy" should also be based on the FTP cycle for the same reason. Section 1968.2 should use "FTP75" and section 1971.1 should use "HD FTP" instead of "FTP" cycles.

    "Post-DOC" heat energy should be replaced with "pre-SCR" heat energy to accommodate potential future aftertreatment architecture with engine close coupled SCR AT element in exhaust. The definition of "pre-SCR heat energy" should be modified to change reference to the heat energy flow "through the DOC" to "prior to the SCR," and "DOC outlet" should be changed to "SCR inlet."

    As a note, for dual SCR applications, only the first SCR catalyst is considered.

    Full useful life AT vehicle is used for the above data collection. All three tracker stop triggers above are constant values per diesel application and will be used for each of these: heat energy release, engine output energy, exhaust gas recirculation (EGR) mass flow, and timer.

    References to "on-road catalyst light-off temperature" in sections 1968.2(g)(6.14.2)(C), (E), and (H) should be changed to "FTP catalyst light-off temperature," and references to "FTP catalyst light-off temperature" in section 1968.2(g)(6.14.2) should include the phrase "as defined in (g)(6.14.1)(A) above." Further, references to "FTP catalyst light-off time" in section 1968.2(g)(6.14.2) should include the phrase "as defined in (g)(6.14.1)(B) above," and references to "specified FTP engine output energy" should include the phrase "as defined in (g)(6.14.1)(D)." Reference to "catalyst light-off temperature" in section 1968.2(g)(6.14.2)(J) should be changed to "FTP catalyst light-off temperature."

    The phrase "the malfunction indicator light (MIL) is commanded on" should be deleted from subsection 1968.2(g)(6.14.3) for pause tracking, since the phrase eliminates pausing for a pending malfunction detection. (AAI)

    Agency Response: CARB staff made some changes based on the received comment. While CARB staff agrees to make some modifications to address manufacturers' concerns, staff also disagrees with some of the comments. Regarding the comment about the method to determine NOx conversion efficiency and 50 percent catalyst light-off temperature, the original proposed regulation language defined the catalyst light-off temperature in general terminologies and did not specify any method to determine this temperature. After discussion with manufacturers, CARB staff proposed first 15-day changes to modify "catalyst light-off temperature" to "catalyst cold start tracking temperature threshold" and to modify the definition such that the temperature threshold refers to when the SCR catalyst temperature that is directly measured or estimated for purposes of enabling diesel exhaust fluid (DEF) dosing reaches 180 degrees Celsius. The

purpose of applying diesel CSERSs is to heat up key aftertreatment elements (e.g., SCR catalyst) quickly. For a diesel system, to make the SCR system work properly for NOx reduction, dosing of the precise amount of urea is necessary. In current system designs, urea injection may begin at SCR catalyst temperatures as low as about 180 degrees Celsius. This reference urea dosing enable temperature may be used as the target temperature to evaluate how quickly the SCR temperature rises. Therefore, this newly defined temperature would appropriately accomplish the purpose of the diesel CSERS trackers and provide a clear and more specific target for diesel CSERS tracking parameters.

Regarding the comment requesting the "catalyst light-off temperature" definition to be modified to refer to "a substantially warmed" SCR catalyst and emission analyzers on the FTP cycle, as described above, CARB staff modified the name and definition of "catalyst light-off temperature" as part of the first 15-day notice. While the changes are not the same as those suggested by the commenter, CARB staff believes the changes will satisfy both CARB staff and manufacturers.

Regarding the comments requesting "engine output energy" to be based on the FTP cycle, CARB staff disagrees and did not make the changes. The "engine output energy" definition provides the calculation method or equation for the engine output energy trackers, which does not take into account the vehicle operation or driving cycle, so mentioning FTP in the definition is not needed. Further, engine output energy tracker #1 does take into account the FTP, since it measures the accumulated energy until the FTP catalyst cold start tracking time is achieved. In addition, the regulation has already accounted for the energy on the FTP with the definition for "specified FTP engine output energy." Regarding the comments requesting that section 1968.2 using FTP75 and section 1971.1 using HD FTP instead of "FTP" cycle, staff also disagrees with the comment. Both regulations already have specific definitions for "FTP cycle" that refer to the specific cycle CARB staff wants to use for these trackers.

Regarding the comment requesting "post-diesel oxidation catalyst (DOC) heat energy" be changed to "pre-SCR heat energy," CARB staff agreed with the comment and made the changes as part of the first 15-day notice. Staff's original purpose for this requirement was to track the heat energy after the engine-out exhaust and entering the NOx catalyst (i.e., SCR catalyst). The change of "post-DOC" to "pre-SCR" would provide clarification and better fitting tracking parameters. Staff agree that for dual SCR applications, "pre-SCR heat energy" means prior to the first SCR catalyst.

Regarding the comment about full useful life aftertreatment vehicles being used for the data collection and the three tracker stop triggers being constant values per diesel application, CARB staff believes the comment is mostly correct about how the tracking parameters work. Each tracking parameter has a different ending point based on parameters such as the "FTP catalyst cold start tracking time" and "specified FTP engine output energy." However, the comment about the data being collected from full useful life aftertreatment vehicles is not entirely accurate - the data collected with this requirement would not only be from full useful life aftertreatment vehicles, but from all diesel vehicles in-use.

Regarding the comments requesting "on-road catalyst light-off temperature" be changed to "FTP catalyst light-off temperature," CARB staff agreed to remove the words "on-road" since it was mistakenly included in the original proposed language. CARB staff revised the phrase "on-road catalyst light off temperature" to "catalyst cold start tracking temperature threshold" for the heat energy release tracker #3, engine output energy tracker #2, and EGR mass flow tracker #3 (sections 1968.2(g)(6.14.2)(C), (E), and (H)) as part of the first 15-day notice. While the commenter wanted these trackers to be based on the conditions of the FTP cycle, CARB staff disagrees since there are already trackers (e.g., heat energy release tracker #1, engine output energy tracker #1, EGR mass flow tracker #1) that account for FTP cycle conditions. Regarding the comments requesting "as defined in (g)(6.14.1)(A)" and similar phrases be included, CARB disagrees and did not make these changes. Section 1968.2(g)(6.14.1) already specifically indicates that the terms in that section are defined "for purposes of section (g)(6.14)." Therefore, CARB staff believes the phrases requested are redundant and not needed. Regarding the comment requesting "catalyst light-off temperature" be changed to "FTP catalyst light-off temperature" for the timer #2 catalyst cold start tracking accumulated time (section 1968.2(g)(6.14.2)(J)), staff did not make this change since the comment is now moot with the revisions to the "catalyst cold start tracking temperature threshold" (formerly "catalyst light-off temperature") definition, which now is defined as a fixed temperature (180 degrees Celsius).

Finally, regarding the comment requesting to remove the phrase "the MIL is commanded on" from section 1968.2(g)(6.14.3), CARB staff disagrees and did not make the changes. CARB staff purposely proposed the requirements for pausing the diesel CSERS trackers to be the same as those for other trackers (e.g., NOx emission trackers in section 1968.2(g)(6.12)) required for OBD systems, which provides for consistent requirements and therefore convenient software implementation.

49. Comment: Section 1968.2(g)(8.1.1) states a 75-day requirement for the over-the-air reprogramming requirements, but Appendix E of the staff report indicates a 60-day requirement. (AAI)

    Agency Response: CARB staff made changes based on the received comment. CARB mistakenly stated "60 days" in the Appendix E of the staff report, and corrected the text to "75 days" in the Attachment C "Updates to Appendix E: Data Record Reporting Procedures for Over-the-Air Reprogrammed Vehicles and Engines Using SAE J1979-2" of the first 15-day notice. "75 days" was chosen to be consistent with the existing regulation requirement in 1968.2(g)(8.1.1), as pointed out by the commenter.

50. Comment: Sections 1971.1(h)(4.3.2) (freeze frame), 1971.1(h)(5.9) CSERS trackers), and 19971.1(d)(5.7) ("IUMPR-lite") are estimated to require 29,760 bytes of NVRAM. This is calculated from: 5 freeze frame fault codes x 2 instances x 256 bytes of data x 2 spare locations per fault code = 5,120 bytes; 10 CSERS tracker accumulators x 2 arrays x 4 bytes x 8 spare locations = 640 bytes; 3 bytes for supplemental monitor activity data (monitor activity ratio, mini-numerator, mini-denominator) x 1000 fault codes x 8 spare locations = 24,000 bytes. Spare locations compensate for flash memory wear-out phenomena. This comes on top of the increases required of 2022 model year engines for NOx binning and greenhouse gas tracking. NVRAM additions are at risk given the uncertainty with the current worldwide semiconductor/chip supply chain shortage. EMA Letter (dated May 28,

2021) to Senate Majority Leader Chuck Schumer, Senate Minority Leader Mitch McConnell, House Speaker Nancy Pelosi, and House Minority Leader Kevin McCarthy, which expresses support for the U.S. Innovation and Competition Act, emphasizes the importance of keeping commercial trucks running without interruption during the COVID-19 pandemic and for post-pandemic economic recovery. The letter indicates the severe semiconductor shortage for electronic devices used in heavy-duty truck engines, transmissions, safety systems, and emissions control device, which is forcing heavy truck, powertrain, and component production slowdowns, resulting in furloughs of workers and causing significant delays in delivering the needed trucks and service parts to fleets. (EMA)

Agency Response: CARB staff made no changes based on the received comment. CARB staff appreciates the comment but points out that 81 percent of the additional memory needs estimated by the commenter to support SMAD or "IUMPR-lite" requirements would only apply for those manufacturers that choose to use the J1979-2 communication protocol. If a manufacturer does not wish to use the SAE J1979-2 protocol, they can always choose the SAE J1939 protocol which is the most commonly used protocol among heavy-duty trucks on the road today. If a manufacturer currently uses the SAE J1979 protocol and does not want to use SAE J1939, they have until 2027 model year to implement SAE J1979-2 which gives ample time for the semiconductor shortage to be resolved and any needed increases in controller memory to be implemented. Further, CARB staff disagrees with the commenter's calculation that 24,000 bytes of NVRAM are required to support SMAD memory requirements. The commenter assumes one byte is required for the mini-denominator for each fault code. The requirement is actually that each diagnostic or emission critical electronic control units (DEC-ECU) store a single one-byte mini-denominator, not each fault code. This reduces the commenter's estimate by about 7,960 bytes down to 16,040 bytes assuming that a vehicle has 5 DEC-ECUs. CARB staff acknowledges that the proposal adds several more kilobytes of data than manufacturers may be used to supporting in memory today, but California's path to clean air has historically required gradual changes in technology in many sectors. Adding a modest amount of memory to an engine controller should not be a difficult technological barrier to overcome considering there are engine ECUs on the market today that include 1 gigabyte of memory for data logging purposes.

Staff have been working with manufacturers to address issues that have developed due to the COVID-19 pandemic and subsequent semiconductor shortage. Again, manufacturers have until the 2027 model year to comply with the proposed amendments. Also, using available flexibilities in the regulation, CARB and industry have reached agreements to keep certification timing on track and avoid production shutdowns. For these reasons, no changes are proposed.

v. Monitoring System Demonstration Requirements for Certification

51. Comment: MIL-on DTC should not be reported as auxiliary emission control devices (AECD). The statement in the staff report that the United States Environmental Protection Agency (U.S. EPA) AECD review includes the determination the auxiliary emission control device (AECD) activation is limited to only the conditions necessary and the modulation of the emission control system is limited to the minimum necessary to achieve the stated purpose, and that the proposal would ensure default strategies are listed in the

application for emissions certification is misleading. The U.S. EPA's AECD review has never included MIL-on DTCs. The difference between AECDs and MIL-on default actions is the very clear indication to the driver and I/M of a fault on the vehicle.

Engine or component protection is not the sole reason manufacturers employ OBD default action software features. Not all OBD default actions increase emissions, and they are taken only when a relevant OBD component has malfunctioned, often to overcome or mitigate inferior or unsafe driving conditions, or preserve the functioning of the OBD system. CARB's statement that it approves the AECD by determining "that AECD activation is limited to only conditions necessary and the modulation of the emission control system is limited to the minimum necessary to achieve the stated purpose" does not support an overbroad requirement that is not related to CARB's stated concern of manufacturers not fully disclosing their default action software features. This is an effort to promote and memorialize in regulations and regulatory justification the position CARB purportedly maintained for some time but only recently disclosed, with a statement in the staff report that "manufacturers have not readily disclosed or justified the default actions as an AECD within the application for emissions certification." Further, CARB first formally stated to industry in Mail-Out #ECC 2020-06 "Alert: Self-Disclosure of Non-Compliant Software and Other Violations by December 31, 2020" (October 14, 2020) that original equipment manufacturers must report MIL-relevant default actions as AECDs. This is not consistent with decades of industry and agency practice. It is not appropriate for an agency to issue a communication announcing a new regulatory interpretation imposing more obligations on the regulated community, especially in cases where it claims the regulated community's past and present failure to comply with the new interpretation represents a systemic violation potentially resulting in significant sanctions – this is especially the case where manufacturers have relied on the agency's previous, longstanding practice to the contrary (see Butts v. Bd. of Trs. Of the Cal. State Univ. (2014) 225 Cal. App. 4th 825, 840). CARB's test procedures for light-duty vehicles currently do not require default actions to be disclosed as AECDs, with "default actions" referring to direct actions taken in response to a malfunction (including those that store pending or confirmed MIL-illuminating fault codes) identified in a manufacturer's OBD certification application. Auto Innovators provided a response to the letter in a November 25, 2020 letter to CARB.

The definitions and disclosure requirements for AECDs and defeat devices dates back 48 years when U.S. EPA issued Mobile Source Pollution Control (MSPC) Circular A/C No. 24 (December 11, 1972), which requires all AECDs to be described in the manufacturer's certification application. 40 CFR section 1803-01 defines AECD as "any element of design which senses temperature, vehicle speed, engine RPM, transmission gear, manifold vacuum, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system," and defines default device as "an AECD that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal vehicle operation and use, unless: (1) such conditions are substantially included in the Federal emission test procedure, (2) the need for the AECD is justified in terms of protecting the vehicle against damage or accident, (3) the AECD does not go beyond the requirements of engine starting..." These definitions, which have been adopted by CARB (e.g., "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," in title 13, CCR section 1961.2(d) and last amended December 19, 2018), have not changed from the original 1972 definition in any way relevant to this rulemaking.

CARB, EPA, and industry have implemented the above-referenced AECD provisions for nearly 50 years, with CARB and industry implementing OBD systems and associated default actions for more than 20 of those years. In that time, CARB and EPA have routinely certified vehicles that take default actions with MIL-relevant fault without requiring those default actions to be disclosed as AECDs. Regulatory agencies and industry have not found this disclosure necessary presumably because MIL-relevant default actions cannot be a defeat device (which has never been understood to encompass default actions since "normal vehicle operation and use" does not include vehicles operating with a fault), the fault condition is known and disclosed (the MIL is illuminated, fault code set, or fault code fault criteria maturing), and the default action sometimes improves emissions and/or diagnostic performance. This long-standing understanding has served as the basis for manufacturer compliance planning.

Manufacturers have been largely reporting some default actions (monitor disablement, emissions neutral default actions, etc.) in OBD applications per the regulation requirements. AECDs and default actions should not be treated the same. AECDs are software features that sense inputs and, as a result of accurate information under normal, non-malfunctioning operating conditions, command some part of the emission control to achieve a purposeful emission control or vehicle protection action, among other things. Default actions are taken after the OBD system detects a fault, stores a fault code or is maturing to set a fault code, notifies the vehicle operator and technician of the fault with the illuminated MIL, and may take action to start the process of addressing the fault. There was never an industry-wide understanding that these portions of the OBD applications needed to be separately duplicated and/or augmented in the AECD section of the of the certification application as the Mail-Out now seems to suggest. Even if the definition of AECD was interpreted broadly to include default actions, there has not been transparent or consistent messaging from CARB or EPA requiring disclosing default actions as AECDs. CARB can adopt a new interpretation of a regulatory requirement so long as it "explains and rationally justifies the change" (Spanish Speaking Citizens' Foundation, Inc. v. Low (2000) 85 Cal. App. 4th 1179, 1215 (quoting Asimow, The Score of Judicial Review of Decisions of California Administrative Agencies (1995) 42 UCLA L. Rev. 1157, 1196-1198), and manufacturers need reasonable lead time to implement a new requirement that may flow from a revised interpretation, so this new requirement must be phased in to allow manufacturers time to analyze and generate the documentation CARB may want. CARB should also clarify the specific model years to which clear guidance would apply.

Therefore, it is premature to incorporate language into section 1968.2(h)(6.4.1) concluding what, if any, requirements apply to fault active default actions. CARB should work with manufacturers to develop standardized means, including defining scope and content, for reporting these default actions. An obligation to report default actions as AECDs should be fully legally justified and outlined so that manufacturers have clear guidance on how this reporting should be done in terms of form and scope, then automakers could potentially support providing additional information to help better understand and evaluate default actions. Discussions should continue between industry

and CARB, and a change of this magnitude should be given proper, separate regulatory development instead of being incorporated as a minor point in a broader regulatory revision. (AAI)

Agency Response: CARB staff made no changes based on the received comment. CARB staff disagrees with the commenter's assertion that all MIL-on default actions are not AECDs. As the commenter mentioned, 40 CFR section 1803-01 defines AECD as "any element of design which senses temperature, vehicle speed, engine RPM, transmission gear, manifold vacuum, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system," and defines defeat devices as "an AECD that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal vehicle operation and use, unless: (1) such conditions are substantially included in the Federal emission test procedure, (2) the need for the AECD is justified in terms of protecting the vehicle against damage or accident, (3) the AECD does not go beyond the requirements of engine starting.." As such, any default strategy that changes the operation of the emission control system, regardless of whether or not there is an associated fault code stored or the MIL is illuminated, meets the definition of an AECD. Furthermore, in 40 CFR section 86.1844 01(d)(11), which requires manufacturers to list all AECDs in the emissions certification application, (and is incorporated in Part I, section H.4. of the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" as incorporated by reference in section 1961.2, title 13, CCR), there are no provisions that exempt manufacturers from listing an AECD, justifying an AECD, and providing a rationale for why that AECD is not a defeat device if the MIL is illuminated.

CARB staff also disagrees with the commenter's assertion that default actions should only be listed in the OBD applications and not the AECD descriptions included with the emissions certification application. The OBD regulations do not address approving or rejecting AECDs, including AECDs that are default strategies. Instead, the OBD regulations include provisions pertaining to default strategies in the durability demonstration vehicle/engine (DDV/DDE) testing sections, specifically related to cases where the OBD system cannot properly illuminate the MIL when the emission malfunction criteria for a particular major monitor is exceeded due to a default strategy being activated or the resulting emissions from the default action are not representative of the emission levels with a malfunctioning component because the default action reduces emissions. In these cases, the OBD regulations provide manufacturers the ability to retest and collect emission data with a worst acceptable limit part or a best performing unacceptable part with the default strategy deactivated to demonstrate compliance with the OBD emission malfunction criteria, so long as those default actions are also listed as an AECD in the certification application.

CARB staff also disagrees with the commenter's assertion that lead time is needed to meet this "new requirement." Regarding the amended language in the DDV/DDE sections (sections 1968.2(h)(6.4.1), 1971.1(i)(5.1.2)(A), and 1971.1(i)(5.1.3)(A)) that any default strategy that is activated when an OBD emission threshold monitor detects a fault is also an AECD disclosed in the application for emissions certification, as outlined above, this is a flexibility for testing, not a new requirement. Further, the language is limited to just default actions that have an impact on determining compliance with the DDV/DDE testing requirements. Therefore, CARB is not required to provide additional lead time to implement these provisions, which would apply as soon as the regulation is effective.

Regarding the comment related to Mail-Out #ECC 2020-06 "Alert: Self-Disclosure of Non-Compliant Software and Other Violations by December 31, 2020" (October 14, 2020) where commenter incorrectly asserts CARB was providing a new regulatory interpretation, CARB also disagrees. The commenter misrepresents the facts. As indicated above, default actions are AECDs so manufacturers were always required to report MIL-relevant default actions. This is not a new reading of the regulatory intent but rather a consistent reading with what the law always required. The Mail-Out was intended to get manufacturers to voluntarily disclose non-compliance because a majority of manufacturers did not come forth and disclose violations of the law. The Mail-Out merely states what the law is and asks manufacturers to voluntarily disclose and come into compliance, which they should have already been doing. It was also meant to inform manufacturers of the potential penalties they could be responsible for (which are outlined in statute) in the event the manufacturers failed to come into compliance. Please see Mail-Out at: *https://ww2.arb.ca.gov/sites/default/files/2020-10/Mailout ECC 2020-06 - Self Disclosure of Violations_R.pdf*. There was never any longstanding practice to the contrary. Because this was not a situation where CARB changed its interpretation, lead time is not needed.

vi. Production Vehicle/Engine Evaluation Requirements

52. Comment: Section 1968.2(j)(1.3) should be changed to delete mention of www.sourceforge.net and to instead read "conduct testing according to SAE J1699-3 using software developed and maintained specifically for SAE J1699-3 testing..." SAE J1699-3 software will no longer be maintained on sourceforge, and instead will be on the Auto Innovators website. The current version will cost an annual license fee, but older versions will be free. SAE J1699-5 should also not be tied to Sourceforge. (AAI)

    Agency Response: CARB staff made changes based on the received comment. CARB staff proposed changes in both the OBD II and HD OBD regulations to remove mention of sourceforge as part of the first 15-day notice. However, CARB did not include language describing SAE J1699-5, since that standard had not been officially published.

53. Comment: For the language in section 1968.2(j)(2.3.1)(B)(ii), which requires testing of 400 "diagnostics" that are not described in section 1968.2(j)(2.3.1)(B)(i), does the term "diagnostic" mean "DTC"? (AAI)

    Agency Response: CARB staff made no changes based on the received comment. The term "diagnostic" refers to a monitor, not DTC. CARB is requiring the manufacturer to test 400 diagnostic monitors, not 400 DTCs since more than one monitor may store the same DTC.

54. Comment: For the production vehicle evaluation (PVE) requirements for in-use monitor performance verification (sections 1968.2(j)(3.2.2)(A) through (C) and 1971.1(l)(3.2.4)(A)), #MSC 06-23 is specified even though it does not include the additional data (e.g., 1968.2(d)(5.7)+D20, (g)(4.1) through (g)(4.9), and (g)(6)). (AAI)

    Agency Response: CARB staff made no changes based on the received comment. CARB staff is aware that the additional data referenced are not specified in CARB Mail-Out #MSC 06-23. The language proposed as part of the 45-day notice did not stipulate that the data be presented in the standardized format described in the Mail-Out. Instead, CARB proposed language indicating that the data be submitted with the other required data. Therefore, manufacturers are allowed to submit the additional data in any format they want (e.g., in tables or designed by the manufacturer). In the future, CARB staff plans to send out a Mail-Out that will describe an optional format that manufacturer may use to submit the additional data—but this is not a requirement, merely an option to make things easier on manufacturers. The Mail-Out is expected to be published around the time the regulation amendments are officially approved and made effective.

55. Comment: For sections 1968.2(j)(3.2.2)(A) through (C) and 1971.1(l)(3.2.4)(A) regarding the PVE (j)(3) submission along with the typical IUMPR spreadsheet, the additional submission requirement to include 1968.2(g)(4.1) through (g)(4.5) and (g)(6), it is not clear what data should be provided under 1968.2(g)(4.2) for data stream, which shows current powertrain data (e.g., engine speed, throttle position, vehicle speed). (AAI)

    Agency Response: CARB staff made no changes based on the received comment. This data submission proposal is requiring manufacturers to provide the current powertrain data for the data stream under section 1968.2(g)(4.2), as the commenter indicated above. The proposed language does not specify any exceptions on the data to be submitted, so manufacturers would be required to submit all the data required under section 1968.2(g)(4.2) (e.g., engine speed, throttle position, vehicle speed). Other requirements of 1968.2(g)(4.2) are vehicle specific, i.e., only applicable if the vehicle is so equipped. Therefore, CARB staff believes the proposed regulation language is clear and no additional changes are needed to the language.

56. Comment: The additional data (1968.2(g)(4.1) through (4.9) and (g)(6)) required to be reported under 1968.2(j)(3.2.2)(B) should be removed. There is no clear rationale to include these data, which are vehicle status/value and not related to IUMPR, which is an average performance of OBD monitors. The additional data are inappropriate for IUMPR reporting. If the data are not removed, clarification of the necessity and value of the data under IUMPR reporting should be given. (Honda)

    Agency Response: CARB staff made no changes based on the received comment. The rationale for requiring the data to be provided has already been described in the staff report. Specifically, these data, which include the standardized data, vehicle operation tracking data and the newly proposed supplemental in-use monitor performance data, are necessary to assist staff in verifying compliance with CARB regulations. The tracking data described in subsection 1968.2(g)(6) would assist CARB staff in other CARB programs to determine if the requirements of those programs are being met, while the other standardized data (e.g., readiness data, test results, data stream parameters) would assist OBD staff in determining if the vehicles/engines are meeting the requirements of the

OBD regulations in-use. Currently, the section for the PVE IUMPR data reporting requirements is the only section in the OBD regulations that require manufacturers to submit data from in-use vehicles, so the placement of the additional data submission requirements in this section is convenient and requires only a few amendments. Therefore, the additional data submission requirements were added to this section. Technically, CARB could have either proposed an entirely new section to house the submission requirements for data other than the IUMPR data, or rename section 1968.2(j)(3) to include mention of any data, not just the IUMPR data. CARB staff will consider such changes in a future rulemaking update.

57. Comment: For the PVE requirements for in-use monitor performance verification (sections 1968.2(j)(3.2.2)(A) through (C) and 1971.1(l)(3.2.4)(A)), the >300 denominator requirement will make an already challenging assignment virtually impossible. The supplemental monitor activity ratio data will provide a lot of additional data not previously available to CARB. Discussions with CARB should continue. (AAI)(EMA)

58. Comment: The 300 general denominator requirement in section 1971.1(l)(3.2.4)(A) should not be adopted. The supplemental monitor activity ratio data can be used for CARB's stated purpose of identifying potentially disabled fault codes or monitors with low monitoring frequency to begin investigations and discussion with manufacturers. Note that SMAD has design limitations where it may not accurately represent in-use monitor performance ratio for some monitors (e.g., diesel exhaust fluid heaters may not execute year-round in California by design/lack of actuator usage). Step changes in monitor performance are more likely to occur early in life, not with increased vehicle mileage/age, due to software/calibration updates by manufacturers (such updates occur less as vehicles age matures).

    The 300 denominator requirement is not practicable given calibration running changes and vocational vehicle considerations. 50 work weeks x 6 working days per week x 1 general denominator per day, 2 trips per day may result in 600 general denominator events. It defines that vehicles are in use, without change for a year, to qualify the data for collection. Service calibration updates, which are reported as running changes in section 1971.1(m), can dramatically reduce the number of general denominator events. Even 2 calibration updates per year reduces the likely number of general denominator events that may be captured below the 300 threshold. For example, for 300 events per year, the events per calibration range from 300 for 0 calibration updates to 2 calibration updates result in 100 events per calibration to 4 calibration updates result in 60 events per calibration. For 600 events per year, events per calibration range from 600 for 0 calibration updates to 120 for 4 calibration updates. The timing of the calibration updates are not considered, where data collection shortly after the update is distributed are challenged to meet the 300 threshold. Manufacturers are not permitted to wait until a year of experience with the most recent calibration update.

    Several vehicle vocations will unlikely meet the 300 general denominator requirement especially with the calibration updates considered. A 5-day work week consists of 50 weeks x 5 days x 1 trip x 1 general denominator per trip = 250 possible events. With 2 trips, it's 500 possible events per year. School busses are used 40 weeks or less per year, 5 days a week, 2 or 4 trips per day, for about 30 minutes to 1 hour per trip, resulting in 400 to 800 possible general denominator events per year. Package delivery, which

minimizes vehicle idling by turning the vehicle off at every stop, has about 600 seconds of qualified operation per trip with 8-hour shifts. The number of stops must be considered. If the number of stops exceeds 50, the number of trips above 600 seconds may be minimal. For 25 stops, it's 1152 seconds per stop, 50 stops is 576 second per stop, and the time per stop further decreases as the number of stops increase (e.g., 100 stops is 288 seconds per stop). (EMA)

Agency Response to Comments 57-58: CARB staff made changes based on the received comment. CARB staff agrees with commenters that the minimum required 300 general denominator criterion may make it more difficult to procure vehicles and therefore deleted the minimum 300 general denominator criterion as part of the first 15-day notice.

59. Comment: It's unclear if the alternate identifier provisions proposed in section 1968.2(j)(3.2.3)(C) were also supposed to be proposed in section 1971.1 or not. This provision should also be proposed in section 1971.1. (EMA)

60. Comment: For the PVE requirements for in-use monitor performance verification (sections 1968.2(j)(3.2.3)(C) and 1971.(l)(3)), the purpose of the proposed alternate identifier in place of the verification identification number (VIN) is to allow manufacturers to get data from a larger group of vehicles when collecting IUMPR data electronically. The VIN is personally identifiable information, so the current regulation allows data collection from only customers who have opted into the highest level of information sharing. The proposal that manufacturers retain the information that matches the alternate identifier to the VIN would still only allow for data collection from customers who opt into this highest level of sharing. Data can be obtained from more California vehicles while ensuring no vehicle is counted more than once if the alternate identifier is not matched to the original VIN (e.g., using a "VIN hash" derived from applying an irreversible mathematical operation to the VIN). The proposal should be revised to still allow alternate identifiers but to oblige manufacturers to collect additional VIN-inclusive data upon request of the Executive Officer if needed for specific investigations or to better understand issues with the data (e.g., bimodal distribution, large data sets with zero or non-compliant IUMPRs) – the language should include the statement "If issues are identified, the EO may require collection of additional data which may include VIN." For the HD OBD regulation, manufacturer data collection may become moot if the data are also collected as part of the upcoming Heavy-Duty I/M requirements. (AAI)(EMA)

Agency Response to Comments 59-60: CARB staff made changes based on the received comments. Regarding the comment about the lack of alternate identifier provisions in section 1971.1, the alternate identifier amendments were requested by manufacturers specifically for the OBD II regulation. However, seeing that such provisions would also be appropriate in the HD OBD regulation, staff proposed the alternate identifier provisions in section 1971.1 as part of the first 15-day notice. Regarding the comments about the provision requiring manufacturers to retain the information matching the alternate identifier to the VIN, CARB staff does not agree with the commenter and did not make any changes based on the comments. Since data from PVE testing are essential tools for determining compliance with the OBD regulations, it is critical that information be provided that allows both manufacturers and CARB to identify these vehicles. This enables CARB to verify data submitted by the manufacturers from specific vehicles. Additionally, should problems or concerns occur with the data and investigations need to

be launched, the procurement of these vehicles can more readily be conducted and issues can be addressed quickly. The proposal by the commenter to procure additional vehicles with the VIN provided was rejected because that would cause delays in investigating the problematic vehicles and resolving the problem and potential air quality impacts.

61. Comment: The new amendment in section 1971.1(l)(3.4.2)(C) requiring manufacturers to provide "a summary of any problems identified in the data" is onerous. The IUMPR spreadsheet is simply a data spreadsheet and is not designed to identify or summarize problems. This summary seems like an evaluation that CARB staff currently performs as part of its review of manufacturer OBD submissions. (EMA)

    Agency Response: CARB staff made no changes based on the received comment. This specific data submission requirement for "a summary of any problems identified in the data" is not new - it is currently required for all PVE (l)(3) reports in the HD OBD regulation (specifically in section 1971.1(l)(3.4)). HD engine manufacturers should already be providing this summary for their in-use engines. The summary is needed to highlight to CARB staff any IUMPR problems to ensure that such problems are not overlooked by staff and are quickly addressed. Considering the enormous amount of data that staff reviews every year, staff may miss such problems if they are not specifically pointed out in the summary, and therefore necessary.

62. Comment: The data and validation requirements of the upcoming Heavy-Duty I/M program would have duplicate requirements, and thus duplicate data submission, with the existing OBD reporting requirements. CARB staff should streamline or consolidate the overlapping data to better align the two programs, and EMA would discuss potential options for such consolidation with CARB staff. (EMA)

    Agency Response: CARB staff made no changes based on the received comment. The Heavy-Duty I/M program requirements had not been finalized at the time these OBD regulation updates were being proposed so staff does not know the exact details of the what the final proposal will entail. Further, the OBD regulation updates will be officially approved and adopted before the proposed Heavy-Duty I/M program requirements. As such, staff believes that it is best to leave the OBD reporting requirements unchanged until CARB OBD staff can determine what information will be required. Additionally, since the OBD-related data reporting for the Heavy-Duty I/M program will be collected by CARB and will not require any data collection by manufacturers, that requirement should not impact manufacturers. However, CARB OBD staff will continue to follow the OBD data collection that will be required by the CARB Heavy-Duty I/M group and will propose appropriate changes to the OBD reporting requirements if necessary.

vii. Deficiencies

63. Comment: Manufacturers were assessed deficiency fines related to the PM filter monitor IUMPR for 2022 model year diesel products, whereas the proposed regulation provides relief starting in the 2022 model year (sections 1968.2(f)(9.2.1) and 1971.1(d)(3.2.1)(C)). CARB should credit these fine payments for any fines paid for deficiencies assessed during the 2022 through 2025 model year, when the proposed regulations provide temporary relief. (AAI)

Agency Response: CARB staff made no changes based on the received comment. Regarding the suggestion to credit previously paid deficiency fines, CARB does not have a system to credit such payments, so CARB cannot credit deficiency fine payments as the commenter suggested. Considering the proposed amendments (including the PM filter monitor IUMPR relief) are expected to be approved and effective in the 2022 calendar year, staff believes this issue should not affect most 2023 through 2025 model year vehicles. Further, CARB does not deem it appropriate to retroactively provide credit for deficiency fines assessed under prior regulations effective at the time.

viii. Comments about Costs

64. Comment: The staff report and the Economic Analysis Support in Appendix F grossly underestimates the regulatory cost impact to manufacturers. (AAI)(EMA)

65. Comment: CARB staff typically use more optimistic assumptions, resulting in lower costs than those projected by automotive engineers. The Board should recognize that the costs of developing, testing documenting, and certifying vehicles to the OBD regulations are far from trivial. (AAI)

66. Agency Response to Comments 64-65: CARB staff made changes based on the received comments. Staff recalculated the costs as part of the first 15-day notice to address some of the industry's comments. CARB staff originally calculated the incremental cost to the California consumer to be $0.67 (when purchasing from large manufacturers) and $7.37 (when purchasing from small manufacturers) for light- or medium-duty vehicles and $14.34 (when purchasing from large manufacturers) and $25.87 (when purchasing from small manufacturers) for heavy-duty vehicles. When staff recalculated the costs, the incremental costs were updated to $1.10 (when purchasing from large manufacturers) and $19.25 (when purchasing from small manufacturers) for light- or medium-duty vehicles and $29.68 (when purchasing from large manufacturers) and $70.19 (when purchasing from small manufacturers) for heavy-duty vehicles. Further details about the updated cost analysis can be found in Attachment D "Addendum to the Initial Statement of Reasons for the Public Hearing to Consider the Proposed Revisions to the On-Board Diagnostic System Requirements and Associated Enforcement Provisions for Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles and Engines, and Heavy-Duty Engine" to the first 15-day notice ("Addendum to the Initial Statement of Reasons (ISOR)"). The final per-vehicle cost estimates presented in this FSOR are slightly different from those presented in the first 15-day notice due to further minor adjustments to the costs. Comment: As an example, regarding the PM filter monitor and IUMPR requirements in sections 1968.2(f)(9.2.1) and (d)(3.2.1)(C), the cost of implementing new electrostatic PM sensor that are not yet available commercially is grossly underestimated. The technology is still under development by a technology company, but no sensor supplier has opted to commercialize the sensor. The USCAR PM sensor task force projects USCAR members will need to invest nearly $1 million just to further the sensor development to make it attractive to suppliers for commercialization. Many sensor suppliers have abandoned diesel internal combustion engine technology development since the industry is shifting towards zero emission vehicles. The Economic Analysis has not represented this upfront technology and supplier development cost at all. The $200/vehicle cost and volume reduction to $125/vehicle cost that CARB estimated for the sensor is unobtainable without commercially available sensors. Additional considerations should be given to

whether multiple sensor suppliers choose to commercialize the technology or not, since the cost will go up if only one supplier commercializes due to lack of competition. AAI questions the source of CARB's estimate that 25 percent of the diesel volume will use the technology, since at least one manufacturer expects 100 percent of its diesel volume will need to implement the new sensor to meet the regulation. The cost to develop the new monitoring algorithm is not adequately represented. In Table F-1 of Appendix F, CARB estimates algorithm development costs to be $4,613 while one manufacturer estimates the cost to be $165,781 (for 2153 hours of development using CARB's hourly rate of $77 for software development), which is 35 times higher. CARB estimates $814 for calibration development, while one manufacturer estimates the calibration, development, and validation of a monitor to cost $118,530 for 2634 hours of development, which is 145 times higher. Sensor suppliers, in cooperation with industry, are also developing an advanced resistive sensor, and similar discussions and analysis exist for this technology. CARB's cost analysis also does not discuss optical sensor technology, though costs to develop this technology are expected to be similar to the electrostatic sensor (with the difference being the existence of at least one sensor supplier for commercialization). Though CARB provided some short-term relief for the PM filter IUMPR, the increased stringency after the relief is thoroughly underestimated. (AAI)

Agency Response: CARB staff made changes based on the received comment. The commenter claimed that USCAR members need to spend nearly $1 million to further develop the electrostatic PM sensor technology prior to commercialization. Due to the intangible nature of future benefits and the uncertainty associated with research and development (R&D) and the fact that manufacturers are always spending on R&D due to continuous technological development to keep up with competitors and customer demand, usually many years ahead of implementation, this category usually has not been included in the cost analysis unless it is clearly driven by the proposed regulatory change. While staff believes that the original sensor hardware cost estimates already include some R&D costs that are directly driven by the proposed requirements, staff acknowledges that the R&D cost specifically raised in this comment was mostly not considered in the original analysis and thus adjusted the testing costs in the first 15-day notice to add specific costs associated with the R&D in electrostatic sensor technology.

The commenter also questioned staff's estimated per-vehicle cost of $125 for the electrostatic PM sensor hardware and the assumption that 25 percent of the diesel vehicles would use this technology. While staff understands that uncommercialized technology will have higher price tags, the $125 per-vehicle cost for electrostatic sensors was based on the assumption that this technology will receive sufficient sales volume to be commercialized. If it is not successfully commercialized, staff assumes that manufacturers will use the other technology discussed in the staff report which represents lower costs. While staff understands that a manufacturer who decides to implement the electrostatic sensor technology is most likely to use it on 100 percent of its diesel volume, staff's assumption of 25 percent sales volume for a "typical" manufacturer was based on the entire sector of the industry that makes diesel vehicles and the assumption that 75 percent of the sales volume would go to diesel vehicles equipped with advanced resistive PM sensors and 25 percent would go to vehicles equipped with electrostatic PM sensors.

The commenter indicated that one manufacturer estimated its algorithm development cost to be 35 times higher than staff's estimates. The gap between the manufacturer's

estimate and staff's estimate is not as high as suggested in this comment because staff applied two factors into the per-manufacturer costs for a "typical" large manufacturer. Specifically, staff assumed 75 percent of diesel volume will use advanced resistive sensor technology, which requires lower number of hours of development compared to electrostatic sensor technology, and staff also applied a 40 percent factor to algorithm development costs associated with diesel requirements according to the assumption that only 6 out of 15 large manufacturers offer diesel vehicles in California (see page 112 of the staff report – OBD II Cost Analysis Assumptions section). Nevertheless, staff has considered the comment and adjusted the hours needed to develop algorithms to meet the proposed PM filter requirements for manufacturers electing to use electrostatic sensor technology from 200 to 2,000. This change only applied to a small portion of the algorithm development cost for a "typical" large manufacturer because, as previously discussed, only 40 percent of the large manufacturers are assumed to offer diesel vehicles and only 25 percent of the diesel volume is assumed to use electrostatic sensor technology. As a result, the algorithm development cost was adjusted upward from $4,613 to $15,376 for a "typical" large manufacturer (see the Addendum to the ISOR). With that, staff is confident the revised cost estimates are reasonable and that the comment regarding algorithm development cost is addressed.

The commenter also indicated that one manufacturer estimated its calibration cost to be 145 times higher than staff's estimate. First, the commenter lumped calibration, development, and validation costs together and estimated 2,634 hours, while staff used the calibration category for calibration related costs and the testing category for validation testing related costs. Second, staff applied a 30 percent discount factor to account for the similarity of engine/vehicle designs relative to the base engine/vehicle used to develop the software algorithm (see page 118 of the staff report which discussed the factor but did not specify the 30 percent figure). Third, similar to the algorithm development category, staff also applied a 40 percent factor to the calibration/testing costs associated with diesel requirements for a "typical" large manufacturer (see page 112 of the staff report – OBD II Cost Analysis Assumptions section). Nevertheless, after reviewing the comment, staff has adjusted estimates upward for the hours needed by a "typical" large manufacturer to calibrate and validate vehicles equipped with different PM sensor technologies, resulting in an increased calibration cost estimate from $814 to $5,740 and an increased testing cost estimate from $587 to $19,408 (see the Addendum to the ISOR).

Regarding the comment about advanced resistive sensor technology, staff did consider this in the original cost analysis. As previously discussed, staff assumed 75 percent of the diesel vehicles will use this technology. For hardware, staff assumed the price will be similar to the current technology, and for software development, staff assumed it will not require as much as the electrostatic sensor because most of the monitoring strategies will be similar to the current strategies.

Finally, regarding the comment about optical sensor technology, staff did review this technology but deemed it not as viable as the other two technologies, which is why staff did not include it in the cost analysis.

67. Comment: Regarding the diesel catalyst/adsorber malfunction criteria determination requirements (sections 1968.2(f)(1.2.4), 1968.2(f)(2.2.4), 1968.2(f)(8.2.5), 1971.1(e)(5.2.4),

1971.1(e)(6.2.3), and (e)(7.2.6)), the costs are also underestimated. One manufacturer estimated the costs to obtain and test 5 high-mileage and 5 field returned catalysts at $750,000 (AAI estimate) or $350,000 (EMA estimate) per engine, which includes about 50 hours of labor and emissions testing per catalyst. The best performing unacceptable (BPU) per catalyst type are also to be tested. So about 1,000 hours of test preparation and testing are required. Additional costs are incurred for field part replacement, shipping, and reactor testing to generate required data for the correlation, and the costs will increase if multiple catalysts are used and diagnosed independently. So CARB grossly underestimated manufacturers' total testing costs. (AAI)(EMA)

68. Comment: For the diesel catalyst/adsorber malfunction criteria determination requirements, CARB grossly underestimated manufacturers' total testing cost of $880, since emissions testing on chassis dynamometers can be more than $1,000 per hour. (AAI)

69. Comment: For the diesel catalyst/adsorber malfunction criteria determination requirements, CARB grossly underestimated manufacturers' total testing cost of $8,555/$4,155, since emissions testing on engine dynamometers can be more than $500 per hour. (EMA)

Agency Response to Comments 67-69: CARB staff made changes based on the received comments. After review of the comments and further analysis, staff revisited the assumptions for per-hour testing costs and recalculated the per-hour testing costs as explained in the Addendum to the ISOR and summarized below. CARB staff originally estimated the per-hour testing rate for light-, medium-, and heavy-duty manufacturers to be $41 based on the technician labor costs, and accounted for the other costs (e.g., equipment, maintenance, overhead) by increasing the number of hours needed to comply with each proposed requirement. After considering the comments, staff decided to revise the cost analysis to a more straightforward method and updated the per-hour testing rate to $308, which includes labor costs to conduct the tests and data analyses, overhead costs for test cell management, equipment acquisition and installation costs, test cell maintenance costs, and utility costs. While the updated hourly rate is lower than the commenters' estimates, staff believes they are appropriate. The increased hourly testing rate resulted in increased cost estimates for all the proposed amendments that have a testing category. In addition, staff would like to point out a few reasons why commenters' estimates appear to be much larger than staff's original estimates. Staff assumed a typical large light- and medium-duty manufacturer has 3 diesel vehicles to calibrate/validate but only 1 vehicle to be tested for this requirement per year, and a typical large heavy-duty manufacturer has 34 diesel engines to calibrate/validate but only 3 engines to be tested for this requirement. Staff applied a 40 percent factor to testing costs associated with diesel requirements for a "typical" large manufacturer (see page 112 of the staff report – OBD II Cost Analysis Assumptions section). Staff assumed four parts are tested (the BPU part and three field returned parts), which is different from the commenter's assumption. One manufacturer assumed 50 hours of testing per part, while staff assumed 18 hours which are believed to be sufficient for this type of testing. Lastly, staff has revised the number of types of component/system to be tested from one to two (one for SCR and one for DOC/absorber, instead of one type assumed originally), resulting in increased cost estimates. With all these factors considered, the per-manufacturer testing costs for meeting this proposed requirement were increased from $880 to $17,763 for a typical

large light- and medium-duty vehicle manufacturer, and from $6,600 to $133,223 for a typical large heavy-duty engine manufacturer (see the Addendum to the ISOR).

70. Comment: Regarding the diesel NOx sensor monitor (section 1968.2(f)(5.2.2)), the cost of the data is again underestimated. Manufacturers have estimated 23 engineering hours for testing per SCR catalyst on a single application, which is $1,725 using CARB's $45/hour rate for calibration engineers, underestimated by 40 percent. The cost analysis does not comprehend more advanced diesel aftertreatment architectures which implement multiple SCRs on one application. (AAI)

    Agency Response: CARB staff made changes based on the received comment. The difference in cost estimates could mostly be explained by the fact that staff applied a 40 percent factor to testing costs associated with diesel requirements for a "typical" large manufacturer (see page 112 of the staff report – OBD II Cost Analysis Assumptions section). In addition, staff adjusted the cost estimate for this requirement to consider dual-SCR systems that are used on a fraction of diesel vehicles but were not considered in the original analysis. With the updated per-hour testing costs discussed in the previous response, the per-manufacturer testing costs for meeting the new diesel NOx sensor monitoring requirements were increased from $1,043 to $8,947 for a typical large light- and medium-duty vehicle manufacturer, and from $26,074 to $223,683 for a typical large heavy-duty engine manufacturer. Note that the final testing cost estimates presented here are slightly different from those presented in the Addendum to the ISOR because the dual-SCR system consideration was added after the first 15-day notice was published.

71. Comment: CARB's estimate of $45 per hour for a calibrator and $77 per hour for a software developer is not aligned with manufacturer pay scale practice, which doesn't differentiate software developer versus calibration engineer. $77 per hour is aligned with industry's cost estimates that were submitted to CARB prior to the 45-day package. (AAI)

    Agency Response: CARB staff made changes based on the received comment. As described in Addendum to the ISOR, staff has adjusted the labor cost for calibrators to be the same as software developers ($77 per hour). This change has resulted in increased estimates for all proposed requirements with calibration costs.

72. Comment: The OBD costs should consider consumer costs associated with vehicle repair including the "repairability" of the malfunction. It provides no value if a malfunction is detected but the cause of the malfunction is not known, the repair is not possible, or the repair is cost-prohibitive. (AAI)

    Agency Response: CARB staff made no changes based on the received comment. Staff does not agree with the comment that the vehicle repair costs should be included in the cost analysis. In general, the OBD regulations encourage manufacturers to build more reliable emissions control systems and also generally improve the efficiency of vehicle repairs by identifying and pinpointing malfunctioning emission components and systems, which has a tendency to reduce repair costs for consumers and not increase repair costs as the commenter has suggested. Considering manufacturers are designing durable robust controls and robust OBD monitors, a malfunction truly exists when the OBD system detects a malfunction, so a repair can be made.

73. Comment: The proposed program should have included a comprehensive technical review, including a thorough cumulative and aggregate cost assessment of the HD OBD regulatory program. CARB noted in the Final Statement of Reasons and Board Resolution 18-53 for the 2018 HD OBD revisions that CARB staff will report back in approximately three years (i.e., the 2021 calendar year) with this review and an updated economic analysis of the OBD program costs and benefits. Accordingly, in the context of this rulemaking, CARB staff needs to specify their plans to implement, document, and solicit comments on this review and cost assessment and how the results will be utilized to reevaluate the overall cost-benefit ratios and efficacy of the existing HD OBD program, especially since the review was not performed in advance of (or in conjunction with) the issuance of the proposed amendments. These analyses are critically important to the ongoing feasibility of the HD OBD program, since, as CARB staff well know, the HD OBD regulations are the most expensive heavy-duty on-highway regulations by more than an order of magnitude (many millions of dollars per year per manufacturer). Significant streamlining of those regulations is necessary to preserve the viability of the heavy-duty market in California. Staff is not justified in ignoring that important directive. Perpetual OBD revisions and additions without any cumulative accounting for costs should not continue. Staff should be redirected to comply with the Board's directive by the end of the year and a separate informational hearing should be held as soon as practicable so the Board can fully and fairly consider the manner in which the OBD program and its costs continue to expand. (EMA)

    Agency Response: CARB staff made no changes based on the received comment. This comment is beyond the scope of the regulation, irrelevant, and ambiguous, and therefore, CARB is not required to respond. Nonetheless, regarding the comment suggesting that staff has been making OBD revisions and additions without any cumulative accounting costs, staff disagrees with this comment. For each HD OBD regulatory change beginning with its initial adoption in 2005, OBD staff conducted comprehensive cost analyses for the regulatory proposals. These cost analyses were described and detailed in the staff report documents for each of the regulatory updates, including the proposed amendments here.

ix. Other Comments

74. Comment: Amendments were recently proposed in title 13, CCR section 1956.8(a)(2)(C)3.a.iv. to provide HD OBD exemption for legacy engines ("Heavy-Duty Engine and Vehicle Omnibus Regulation and Associated Amendments; Second Notice of Public Availability of Modified Text and Availability of Additional Documents"). The amendments, including any exceptions to the OBD provisions, should be clearly stated or referenced in sections 1971.1 and 1971.5 to ensure all applicable HD OBD certification and enforcement requirements are considered and applied appropriately to legacy engine families. (EMA)

    Agency Response: CARB staff made changes based on the received comment. CARB staff proposed changes in sections 1971.1 and 1971.5 as part of the first 15-day notice to acknowledge the legacy engines. The proposed language would allow for 2025 and 2026 model year engines certified to these "legacy engine" provisions in section 1956.8 to meet the 2023 model year OBD requirements and to exempt them from associated phase-in schedules.

75. Comment: The Board should take note of the multiple pending and overlapping programs affecting engines, vehicles, and equipment manufactured by EMA members (e.g., Advanced Clean Trucks rule, Heavy-Duty Omnibus program, Heavy-Duty I/M program), especially where regulatory changes conflict or are duplicated, which will be the case with the OBD rulemaking update. It should be ensured that changes to OBD requirements in other regulations are clearly stated, or at a minimum clearly referenced, in the OBD regulations. The Board should also consider the burden (including compounding costs) that multiple regulations will increasingly impose on the regulated industry. (EMA)

    Agency Response: CARB staff made changes based on the received comment. CARB staff is aware of the other heavy-duty programs and have taken steps to ensure the proposed amendments are consistent and nonduplicative among the other programs. For example, staff proposed changes to the OBD regulations to account for the provisions adopted with the Heavy-Duty Omnibus program. As for the Heavy-Duty I/M program, staff is following the regulation development of that program to ensure the requirements do not conflict with the OBD requirements. For each rulemaking that includes changes to the OBD regulations that affect costs, staff includes a cost analysis of these OBD changes.

76. Comment: CARB should continue exploring the potential concepts for future comprehensive I/M programs that OBD data would enhance. MECA supports the use of on-board monitoring, potentially telematics, to screen vehicles that were manufactured with the applicable OBD sensors. Future programs may use downloaded information (e.g., malfunction code) from the OBD module as part of a thorough I/M program to analyze vehicle operation and diagnose current and potential issues. (MECA)

    Agency Response: CARB staff made no changes based on the received comment. This comment is beyond the scope of the proposed amendments and therefore, CARB is not required to respond. However, CARB and its partner agencies (e.g., Bureau of Automotive Repair (BAR)) are always looking for ways to improve the existing I/M programs by making them more effective and efficient at finding and fixing vehicles with malfunctioning emission control systems. For example, CARB is currently working on a new I/M program for heavy-duty vehicles that is expected to utilize telematics to download OBD data to conduct a remote smog check inspection. Similarly, BAR, who is in charge of the I/M program for light-duty vehicles in California, currently has a pilot program named "Continuous Testing Program Pilot" that is evaluating the use of telematics for Smog Check inspections on government fleet vehicles. As suggested by the commenter, CARB plans to continue to explore ways to continually improve California's I/M programs for on-road vehicles.

B. First 15-Day Comments

77. Comment: We do not support the proposed addition of "issues found during production vehicle evaluation (PVE) testing under section (j) from a previous model year" to the cover letter in sections 1968.2(i)(2.14) and 1971.1(j)(2.16). Though manufacturers currently do and will continue to report any issues identified during PVE testing, the language is overly broad and could result in multiple updates to the cover letter and delay the issue of an Executive Order. There seems little reason to report "resolved" issues found during PVE testing. (AAI)

78. Comment: We propose changing the language to "unresolved issues identified during production vehicle evaluation testing under section (j) (for section 1968.2)/(l) (for section 1971.1) from the previous model year that are known at the time of the current OBD certification application submission." (AAI)(EMA)

    Agency Response to Comments 77-78: CARB staff made changes based on the received comments. CARB staff agreed to clarify the language and proposed to change the language to "unresolved issues" identified during PVE testing as part of the second 15-day notice. However, CARB staff disagreed with the rest of the commenters' proposed changes and did not make these changes. This proposed language was placed in the list of examples that follows the phrase "all other known issues that apply to the current model year vehicle/engine," which is the language in the current regulation. Therefore, the proposed language is an example of these types of "known issues" that must be included in the cover letter of the OBD application and are not meant to be inclusive of all examples of information that are required to be included in the cover letter. Additionally, regarding the commenter's proposal to change "a previous model year" to "the previous model year," CARB staff believes that example is meant to restrict the types of issues found, while CARB's staff use of "a previous model year" is meant to include any issues found in model years other than the one immediately preceding the current model year, which staff believes is important to include. Further, CARB disagrees with the comment that only issues known at the time of the current OBD certification application submission should be included in the cover letter. As stated in the second 15-day notice, manufacturers are expected to update the cover letter any time a new issue is found after the original submission of the OBD application and up until the Executive Order is granted, since it is important that such issues are documented in the actual application to make clear this issue exists for the test group/engine family of concern. The manufacturer should be updating the cover letter only to include a description of the new issue, and therefore, CARB staff believes this update will not delay the issue of an Executive Order.

79. Comment: The proposed language in sections 1968.2(i)(3.2.3)(C) and 1971.1 (l)(3.4.3)(C) should be changed from "The manufacturer shall provide the VIN for a specific alternate vehicle identifier upon request from the Executive Officer" to "The manufacturer shall provide additional VIN specific data upon request from the Executive Officer." (AAI)

80. Comment: Section 1971.1(l)(3.4.3)(C) should either be deleted or revised. The proposed paragraph was added to be consistent with section 1968.2(i)(3.2.3)(C), so further amendments to this paragraph should be identical in both sections. (EMA)

81. Comment: The allowance to use alternative vehicle identifiers instead of VINs provides for completely anonymized data to maintain customer privacy, since the VIN is personably identifiable information (PII) and not associated with any data shared by the manufacturer. The intent of the provision is to provide a richer data set. (AAI)(EMA)

82. Comment: Since paragraph (C) requires manufacturers to maintain VINs and associate them with the data shared, the benefits of alternative vehicle identifiers are negated. We agree that if a problem is identified, manufacturers could obtain and provide data relatively quickly from vehicles where appropriate customer permission has been obtained. (AAI)

Agency Response to Comments 79-82: CARB staff made no changes based on the received comments. CARB staff already provided a response to similar comments that were submitted during the 45-day notice comment period (see agency response to comments 59-60) and that response is also applicable here. As a note, though the commenters mention section 1968.2(i)(3.2.3)(C), the correct section number is actually 1968.2(j)(3.2.3)(C).

83. Comment: The language in section 1968.2(k)(3) should be changed from "produced for sale in California" to "produced and delivered for sale in California," which is standard terminology used for many years in other CARB regulations (e.g., section 1962.2, ZEV regulations). We understand this language differs from the heavy-duty OBD regulation (section 1971.1), but those regulations apply to a wide variety of engine and chassis (which contains the OBD system), which may be several steps from the completed vehicle delivery and sale. The overwhelming majority of vehicles covered in section 1968.2 are complete vehicles, and this terminology is fully known and understood. (AAI)

    Agency Response: CARB staff made changes based on the received comment. CARB staff agreed and made this change as part of the second 15-day notice.

84. Comment: There is a typo in section 1968.2(j)(1.4.2)(E). It incorrectly reads "Service $22, PID $01 for SAE J1979-2," which refers to the old/current SAE J1979. The correct PID for SAE J1979-2 is PID $F501. (AAI)

    Agency Response: CARB staff made changes based on the received comment. CARB staff agreed and made this correction as part of the second 15-day notice.

85. Comment: The new requirement for communications to a scan tool in section 1968.2(g)(3.4.2)(A) through (E), which includes some prohibitions of the proper response specified in SAE J1979-2, should be removed. Traditionally, we develop communications to a scan tool in accordance with the standard. If the requirements will not be removed, we request clarifications of the necessity of this requirement. (Mazda)

86. Comment: The following language should be added to address missing monitors (e.g., EI-AECD, CSERS) and any new monitors in section 1971.1(h)(3.1.3): "The OBD system may respond with NRC $78 for any data that is not ready or available." We question the necessity of the added language in this section, since this was already adjudicated and defined in SAE J1979-2. In some cases, the proposed additions directly conflict with SAE J1979-2. Further, during development of SAE J1979-2, it was noted that it is not technically feasible to have an immediate response for these monitors. (EMA)

    Agency Response to Comments 85-86: CARB staff made no changes based on the received comments. CARB had concerns with certain SAE J1979-2 NRCs after the April 2021 SAE J1979-2 standard was published. CARB is concerned that excessive use of NRCs can negatively affect the performance of the OBD system by slowing OBD communication to the generic scan tool. CARB subsequently negotiated with the SAE J1979 committee to revise specific NRC behavior. The revised NRC behavior was documented in sections 1968.2(g)(3.4.2)(A) through (E) in the regulation language made available as part of the first 15-day notice and will be documented in the next publication of the SAE J1979-2 standard.

The current SAE J1979-2 standard and future revision allow for NRC $78 when the generic scan tool requests the calibration verification number, NOx emission tracking data, and various other vehicle/engine operation tracking data. However, the CSERS tracking data were not included in the proposed amendments regarding NRCs because the regulations did not require these trackers initially. Concerning the EI-AECD tracking data, manufacturers had not come to CARB with supporting information showing that these data needed longer response times. The regulation does not allow for a blanket exemption to allow engine control units to respond with NRC $78, and CARB is concerned that NRCs can negatively affect the performance of the OBD system.

87. Comment: The 15-day notice failed to include an alternate phase-in allowance for the new CSERS tracking requirements in sections 1971.1(h)(5.9.2). The definition of "alternate phase-in" in section 1971.1(c) should be revised to include mention of section (h), so that it reads "based on the manufacturer's projected sales volume of all engines unless specifically stated otherwise in section (e), (f), (g), or (h))." Additionally, sections 1971.1(g)(5.8) and (g)(5.8.1) should be revised to include reference to section (h) and section (h)(5.9.2) for the CSERS tracker phase-in. (EMA)

    Agency Response: CARB staff made changes based on the received comment. CARB staff agrees that the proposed regulation language mistakenly did not include language allowing manufacturers to use alternate phase-ins for the newly proposed CSERS tracking requirements, and proposed changes to the definition of "alternate phase-in" in section 1971.1(c) as well as section 1971.1(h)(7) to address this as part of the second 15-day notice. CARB staff proposed changes to section 1971.1(h)(7) instead of (g)(5.8), since section 1971.1(g)(5) is specifically only for monitoring requirements, not standardization requirements.

88. Comment: CARB should include an explanation in the Statement of Reasons explaining why the 0.500 value was chosen for heavy-duty vehicles in section 1971.1(d)(3.2.2)(B)(ii) to clarify that this higher value only applies in this specific circumstance. (EMA)

    Agency Response: CARB staff made no changes based on the received comment. Staff already included an explanation about why the minimum IUMPR for the gasoline CSERS catalyst heating monitor was increased from 0.300 (which was proposed as part of the 45-day notice) to 0.500 (which was proposed in the first 15-day notice) in the first 15-day notice. CARB staff proposed new denominator incrementing criteria for this monitor (see section 1971.1(d)(4.3.2)(N)). Since the new denominator incrementing criteria essentially match the conditions in which monitoring is required to occur in sections 1971.1(f)(4.2.3), which effectively will result in the numerator incrementing almost every time the denominator increments (i.e., result in an expected ratio near 1.000), staff believes a higher minimum required ratio is needed. As indicated in section 1971.1(d)(3.2.2)(B), the minimum ratio of 0.500 only applies to the catalyst heating monitor required by section 1971.1(f)(4.2.3) and does not apply to any other monitor. Please see pages 3 to 4 in the first 15-day notice.

89. Comment: In section 1971.1(f)(4.2.3), an alternate schedule for the cold start catalyst heating monitor should be provided. (EMA)

Agency Response: CARB staff made no changes based on the received comment. CARB staff is unsure what the commenter is requesting as this comment is ambiguous. If the commenter is asking that a phase-in schedule be provided for the monitor, CARB already proposed this as part of the first 15-day notice. If the commenter is asking that manufacturers be allowed to use an alternate phase-in schedule in lieu of the proposed required phase-in schedule, the regulation already has language allowing for this (section 1971.1(g)(5.8)).

90. Comment: We recommend deleting the language "in park or neutral" in section 1971.1(f)(4.2.3). For heavy-duty spark-ignition products, catalyst warm-up strategy is not necessarily dependent on the gear selector input from the transmission control unit as this would bring the transmission into the OBD boundary. The proposed language creates an improper and unnecessary connection between the vehicle and engine, as it would require OBD monitoring for the gear selector inputs that are not controlled by the engine manufacturer. (EMA)

    Agency Response: CARB staff made changes based on the received comment. Staff agrees that such heavy-duty engines should not be required to monitor when the transmission is in park or neutral, and proposed language that would allow manufacturers to request Executive Officer approval to enable the monitor without regard to the transmission gear position provided the manufacturer submits data or engineering evaluation showing that the transmission gear position has no effect on the catalyst heating strategy. These changes were proposed as part of the second 15-day notice.

91. Comment: The proposed requirement to provide a report as one single file in section 1971.1(l)(1.5.1) will make the report unwieldy for some manufacturer or given file submissions due to the amount of data required. Also, the summary report in section 1971.1(l)(2.4.2) should be an independent submission from the section 1971.1(l)(2.4.1) report(s). So section 1971.1(l)(2.4.1) should be revised to indicate "a report or reports" or "report(s)" instead of "report," while section 1971.1(l)(2.4.2) should be revised to mention "a summary report" instead of "the summary report." (EMA)

    Agency Response: CARB staff made changes based on the received comment. Concerning section 1971.1(l)(1.5.1), CARB staff does not believe the single file will be unwieldy and that the amount of data required in this report is enough to cause issues with manufacturers. However, CARB staff did find that the regulation language proposed as part of the first 15-day notice mistakenly included the test log files in this report, which was not intended, and therefore proposed changes to have the test log files submitted separately from the report as part of the second 15-day notice.

    Concerning sections 1971.1(l)(2.4.1) and (l)(2.4.2), CARB staff disagreed with the comments and did not make changes to address them. Having all of the information in one report for each verification of monitoring test conducted would facilitate staff's review since the data, information, and explanations would all conveniently be located in one file. Furthermore, if the information was distributed across multiple files for the same test, then staff's review time would be unnecessarily protracted and is susceptible to review mistakes. Currently, manufacturers submit one report for each verification of monitoring test conducted and the report is required to identify the method used to induce a malfunction in each diagnostic, the MIL illumination status, the fault code(s)

stored, and a summary of any problems identified during testing. The additional information proposed to be included in the report as described in section 1971.1(l)(2.4.2) would be a very small fraction of the total amount of data and information already required to be included in the report. CARB expects that only a few pages or tabs added to the existing required reports will be needed to sufficiently address the new proposed requirements. Additionally, in case there was any confusion by the commenter, the proposed changes to section 1971.1(l)(2.4) are not requiring one single file for the whole model year, but instead maintain the existing requirements in that a single report is needed for each testing conducted pursuant to section 1971.1(l)(2), resulting in up to three different reports per model year depending on the number of engine families certified.

92. Comment: The language in section 1971.1(l)(2.1) should be revised to clarify that the 6-month clock begins at the start of vehicle or engine production "for the engine family and rating selected for section (l)(2.2.1)." The completion of PVE (l)(2) testing depends on the production of the rating selected for durability demonstration engine testing, which could occur much later than the "start of production" as defined in section 1971.1(c). (EMA)

    Agency Response: CARB staff made changes based on the received comment. CARB staff agreed that the start of the clock should depend on the start of the production of the engine rating or engine rating and chassis application combination, not the engine family, and proposed changes to the definitions of "start of engine production" and "start of vehicle production" in section 1971.1(c) to address this as part of the second 15-day notice.

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 CARB. Specifically, the scientific basis or scientific portion of a proposed rule may be subject to this peer review process. Here, CARB 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.