State of California
AIR RESOURCES BOARD

Notice of Public Availability of Modified Text and Availability of Additional Documents

PROPOSED REVISIONS TO ON-BOARD DIAGNOSTIC SYSTEM REQUIREMENTS FOR HEAVY-DUTY ENGINES, PASSENGER CARS, LIGHT-DUTY TRUCKS, MEDIUM-DUTY VEHICLES AND ENGINES

Public Hearing Date: September 24, 2015
Public Availability Date: March 21, 2016
Deadline for Public Comment: April 6, 2016

At its September 24, 2015 public hearing, the Air Resources Board (ARB or Board) approved for adoption amendments to the California Code of Regulations (CCR), title 13, sections 1900, 1968.2, and 1968.5, as modified by staff's suggested modifications presented to the Board at the September 24, 2015 hearing. The amendments would update the on-board diagnostic (OBD II) system requirements and associated enforcement provisions for passenger cars, light-duty trucks, and medium-duty vehicles and engines to account for Low Emission Vehicle III (LEV III) applications, to update monitoring requirements for gasoline and diesel vehicles and engines, and to clarify the regulation.

At the hearing, staff presented, and the Board approved for adoption, modified regulatory language developed in response to comments received since the Initial Statement of Reasons was released to the public on August 4, 2015. These modifications include changes to the monitoring requirements for gasoline positive crankcase ventilation (PCV) systems, diesel crankcase ventilation (CV) systems, and diesel non-methane hydrocarbon (NMHC) converting catalysts, and changes to the vehicle performance tracking requirements.

The Board directed the Executive Officer to make the modified regulatory language and any additional conforming modifications available for public comment, with any additional supporting documents and information, for a period of at least 15 days as required by Government Code section 11346.8. The Board further directed the Executive Officer to consider written comments submitted during the public review period and make any further modifications that are appropriate available for public comment for at least 15 days, and present the regulation to the Board for further consideration if warranted, or take final action to adopt the regulation after addressing all appropriate modifications.

The resolution and all other regulatory documents for this rulemaking are available online at the following ARB website:

http://www.arb.ca.gov/regact/2015/obdii2015/obdii2015.htm

The text of the modified regulatory language for sections 1968.2 and 1968.5 is shown in Attachment A. The originally proposed regulatory language is shown in ~~strikethrough~~ to indicate deletions and underline to indicate additions. New deletions and additions to the proposed language that are made public with this notice are shown in ~~double strikethrough~~ and double underline format, respectively. The text of the modified regulatory language for sections 1900, 1956.8, 1971.1, 1971.5, and 2485 of title 13, CCR, and sections 95302 and 95662 of title 17, CCR is shown in Attachment B. The new proposed deletions and additions to the language that are made public with this notice are shown in ~~strikethrough~~ to indicate deletions and underline to indicate additions.

In the Final Statement of Reasons, staff will respond to all comments received on the record during the comment periods. The Administrative Procedure Act requires that staff respond to comments received regarding all noticed changes. Therefore, staff will only address comments received during this 15-day comment period that respond to this notice, documents added to the record, or the changes detailed in Attachments A and B.

Summary of Proposed Modifications

The following summary does not include all modifications to correct typographical or grammatical errors, changes in numbering or formatting, nor does it include all of the non-substantive revisions made to improve clarity.

Modifications to OBD II Regulation (section 1968.2)

1. Section 1968.2(c): As part of the 45-day notice, staff proposed a new definition of "active off-cycle credit technology" to complement the new proposed data requirements in section 1968.2(g)(6). Manufacturers have asked for more clarification on the types of technologies that are or are not considered "active off-cycle credit technologies." Staff is proposing to revise the definition to include more examples of what would and would not be considered "active off-cycle credit technologies" for the purposes of these new data parameters.

   As part of the 45-day notice, staff proposed new definitions for "charge depleting operation," "charge increasing operation," and "charge sustaining operation" to complement the new proposed data requirements in section 1968.2(g)(6) regarding plug-in hybrid electric vehicles. Based on discussions with industry concerning the new requirements in section 1968.2(g)(6), staff has determined that revisions need

to be made to these definitions. First, additional descriptive text and examples were provided in each of the definitions to provide more clarity as to what types of vehicle operation fall into each of these categories. The additional text includes defining the conditions used to determine a transition from one operating condition to another such as the transition from charged depleting to charge sustaining operation. Second, in the additional text for charge increasing, the definition was changed to more explicitly mean "driver-selectable charge increasing operation" and clarify it is the condition where both the driver has selected a mode intended to increase the state of charge of the battery and the current intent of the control system is to increase the state of charge to a higher target value. This definition change will better account for extra greenhouse gas (GHG) emissions from (and fuel consumed by) the vehicle engine to charge the battery in addition or in lieu of the use of grid energy to charge the battery. The definitions also provide examples of typical driver-selectable features such as 'charge now' or 'hold' buttons intended to alter the normal control strategy and provide instruction as to how operation in each should be classified.

Staff has also determined through discussions with industry that new definitions must be added for "grid energy" and "non-grid energy" to ensure consistent implementation of the new data requirements in section 1968.2(g)(6). A proposed definition for "grid energy" is included and defined to encompass all energy put into a battery from off-board charging events (e.g., while plugged into the grid) to allow manufacturers to consistently track total grid energy into the battery. To accommodate tracking grid energy consumed by the vehicle (e.g., out of the battery during driving), a parallel proposed definition for "non-grid energy" was added. This definition includes any energy into the battery during specific driving operation from such events such as regenerative braking or operation of the engine to charge the battery. By defining non-grid energy, a hierarchy can be used by manufacturers to simultaneously keep track of grid and non-grid energy in the battery and assume any battery energy consumed during driving utilizes all available non-grid energy before reporting additional grid energy consumed in the required data parameters. This simplification of classification for energy in and out of the battery provides clear direction to manufacturers on how to account for all energy in a consistent manner. Last, staff has concurrently been working with the SAE J1979 committee to ensure the technical specifications for these new parameters are structured consistently with the proposed regulatory language.

Staff is proposing to delete the definitions for "emission standard," "evaporative emission standard," and "exhaust emission standards" or "tailpipe emission standard." Details about the proposed deletions are provided below in the discussion regarding modifications to the "emission standard" definition in various regulations.

As part of the 45-day notice, staff proposed a new definition of "emissions neutral default action" to complement the amendments applicable to emissions neutral diagnostics. First, the proposed definition includes a criterion related to the activation time of the compensating control action/default mode of operation. This specifically requires the emission-neutral state to remain activated across driving cycles (until the malfunction is no longer present/cleared) where the emissions neutral diagnostic and default action take more than 10 seconds (from engine start or the first effect of the monitored system or component in the driving cycle) to detect the malfunction and completely achieve the emissions-neutral state. Some manufacturers have indicated that 10 seconds is insufficient time to detect a malfunction and activate the emissions neutral default action, and requested that the time be increased to 30 seconds. Staff proposed 10 seconds to minimize the time it takes for the vehicle to activate the emissions neutral default action, but agrees that a longer time is needed. Staff is proposing to increase the time to 30 seconds from engine start or the first effect of the monitored system or component in the driving cycle. Second, the proposed definition includes a criterion indicating that if the default mode of operation prevents vehicle propulsion, it must not be activated by a "non-transmission diagnostic for a component or system that is specifically named" in the comprehensive component monitoring requirements. Manufacturers argue that any default mode of operation that prevents vehicle propulsion should be considered an emissions neutral default action, even those caused by non-transmission diagnostics, and indicated that it is unclear what components/systems are "specifically named" in the comprehensive component monitoring requirements. While staff disagrees that any default mode of operation that prevents propulsion should be included, staff agrees that the wording of "specifically named" is unclear. The intent of the language is to ensure that manufacturers do not use a no-propulsion state to avoid a malfunction indicator light (MIL)-on condition, and by extension emission warranty coverage of high-priced components. Staff is proposing to revise the language to specifically prohibit the use of no propulsion/no start as an emissions neutral default action for components/systems determined to be "high price warranted parts" per CCR , title 13, section 2037, subdivision (c) .

As part of the 45-day notice, staff proposed a new definition of "emissions neutral diagnostic" to complement the amendments applicable to these diagnostics throughout the regulation. The proposed definition requires that such diagnostics be located within a diagnostic or emission critical electronic powertrain control unit (DEC ECU) or control unit meeting the automotive safety integrity level (ASIL) C or D specifications of International Organization for Standardization (ISO) 26262-5. A manufacturer had indicated that the diagnostics should also be allowed to be located within control units that do not meet the ASIL C or D specifications or the DEC ECU definition but that are unlikely to be tampered with in-use, such as gateway modules that are critical to normal vehicle operation. Such control units would be considered diagnostic or emission critical powertrain control units starting in the 2019 model year, when field reprogrammable control units with primary control over any

rationality or functional diagnostic of a comprehensive component would be included. One manufacturer requested that its control units not be considered DEC ECUs and requested the DEC ECU definition be modified to exclude control units that are field reprogrammable control units but not likely to be tampered with in-use. Staff believes that including such vague criteria would result in complicated discussions regarding whether or not a control unit can be "tampered with," and given the critical role DEC ECUs play in the vehicle diagnostic system staff proposes to not modify this definition to allow such provisions. However, as an intermediate step to allow manufacturers time to comply with the new DEC ECU requirements and to provide flexibility for emissions neutral diagnostics to be located in a wider range of control modules, staff is proposing to modify the definition of "emissions neutral diagnostic" to allow the diagnostics to be located in control units where "the manufacturer demonstrates to the satisfaction of the Executive Officer that the control unit the diagnostic is located within is not likely to be tampered with in-use." Additionally, staff is proposing changes to the definition of "propulsion system active." The OBD II system is required to keep track of the amount of time a hybrid vehicle is in the state of "propulsion system active" in order to meet the in-use monitor performance requirements of the OBD II regulation. As part of the 45-day notice, staff proposed modifications to clarify that the definition of "propulsion system active" does not include remote start activations that "do not" cause an engine to start. This language was intended to make clear that remote start activations that, by design, do not have the ability to start the engine without additional driver action (e.g., the driver getting into the car and performing actions to drive the car) would not be considered "propulsion system active" time. In such designs, the propulsion system active time would not begin incrementing until the additional driver action occurred. Conversely, for remote start activations that do have the ability to start the engine without additional driver action, the language was intended to clarify that remote start activation would be considered "propulsion system active" time. However, the wording of "do not cause an engine to start" in the initially proposed modifications could have been interpreted to require manufacturers to include or exclude the remote start activation time based on whether the engine actually did or did not start during the activation (and retroactively include time back to the start of the remote activation if an engine start did occur). Staff is proposing to clarify that the distinguishing feature is remote start activations that "cannot" (instead of 'do not') cause an engine to start, and that such designs would exclude all remote start activation time from being considered as "propulsion system active" time.

Also, as part of the 45-day notice, staff proposed a new definition of "safety-only component or system" to complement the amendments exempting safety-only components or systems from certain OBD II requirements, with the definition describing "hybrid high voltage containment systems" as examples of safety-only components/systems. Some manufacturers have indicated confusion about what "hybrid high voltage containment systems" are, indicating that the terminology was not consistently used within industry, and have requested that specific examples of

such systems be listed as part of the definition. Staff is proposing language to include such examples.

Finally, as part of the 45-day notice, staff proposed a new definition of "smart device" to complement the amendments to the monitoring requirements applicable to smart devices. The proposed definition included a sentence indicating that "devices that control transmissions or battery packs are excluded from this definition." Manufacturers expressed concern that the language could exclude sensors/devices that are used by the engine control module, such as engine sensors that have a direct effect on transmission or battery pack control. Staff did not intend to exclude such sensors/devices from the definition of smart devices, and is proposing changes that would limit this exclusion to devices that "provide high level control" (i.e., are the primary controllers) of transmissions or battery packs.

2. Section 1968.2(d)(2.2.3): As part of the 45-day notice, staff proposed language requiring the OBD II system illuminate the MIL in the event of a malfunction of a smart device that can affect the performance of the OBD II system. Manufacturers have argued that this new language was not needed since the monitoring of the smart device was already covered under the proposed language in the comprehensive component monitoring requirements (sections 1968.2(e)(15) and (f)(15)). Thus, staff is consequently proposing to delete mention of "smart device" in this section.

3. Section 1968.2(d)(2.4): As part of the 45-day notice, staff proposed language indicating when OBD II systems are required to erase confirmed fault codes based on the number of warm-up cycles in which the malfunction has not been detected and requiring that the "MIL is not presently illuminated" for a malfunction. Manufacturers have indicated that the language was not clear, specifically about which warm-up cycle(s) the MIL was required to be off (e.g., MIL off for the specific malfunction during all the 40 required warm-up cycles). Staff intended for the MIL to be off during all the required warm-up cycles, and is proposing language to clarify this in this section.

4. Section 1968.2(d)(2.5.2)(F): As part of the 45-day notice, staff proposed language requiring permanent fault codes for certain engine cooling system malfunctions to be erased under the criteria in section 1968.2(d)(2.5.2)(A) instead of 1968.2(d)(2.5.2)(B) starting in the 2019 model year. This amendment was proposed to correct an oversight, since the criteria under section 1968.2(d)(2.5.2)(B) are generally applicable to monitors that run continuously while the engine cooling system monitors of concern are not required to run continuously. Manufacturers have requested that they be given the option to use either set of criteria for these monitors for easier implementation of the requirements. Staff is proposing to allow manufacturers to use either set of criteria for these engine cooling system monitors, and also propose to delete the 2019 model year start date since this is now an

optional requirement.

5. Section 1968.2(d)(2.6): As part of the 45-day notice, staff proposed language to allow for exceptions to the MIL illumination and fault code storage requirements to prevent unnecessary illumination of the MIL and storage of fault codes. These include default strategies that meet certain criteria, such as auxiliary emission control devices (AECDs) that are properly activated, in section 1968.2(d)(2.6.1). Manufacturers have indicated that "default strategies" are only activated due to the occurrence of a fault, and thus, AECDs should not be mentioned in this section considering they are not activated due to a fault but rather due to the occurrence of specific operating conditions. Staff's intention was to prevent manufacturers from illuminating the MIL when an AECD is activated. Thus, staff is proposing to move the reference to AECDs to a separate section, new section 1968.2(d)(2.6.3).

6. Sections 1968.2(d)(3.2.1) and (d)(4.3.2)(M): As part of the 45-day notice, staff proposed language addressing gasoline evaporative system high-load purge monitors. These included clarifying language in section 1968.2(d)(3.2.1) indicating that these monitors were required to meet minimum in-use monitor performance ratios of 0.520 and new requirements in section 1968.2(d)(4.3.2)(M) for incrementing the evaporative system high-load purge monitor denominator to address concerns about low monitoring frequency (and thus low in-use monitor performance ratios) due to high-load purging requiring extreme conditions to execute. Specifically, section 1968.2(d)(4.3.2)(M) included criteria requiring high-load purging conditions to occur on two or more occasions for greater than two seconds or for a cumulative time greater than or equal to ten seconds, which were intended to more accurately depict conditions under which high-load purging occurs. First, there has been confusion about what driving conditions the 40-degree-Fahrenheit criterion would apply to. Staff is proposing language clarifying that the 40-degree-Fahrenheit condition applies to the 600-second "cumulative time since engine start" criterion. Second, manufacturers have indicated that the proposed denominator incrementing criteria are still too stringent, indicating that high-load purge monitoring requires sustained vehicle operation during high load conditions, and are concerned that the proposed criteria may cause low in-use monitor performance ratios. Manufacturers have proposed conditions to increment the denominator that would ensure their monitors would run and complete. Staff would like to reiterate that the denominator is a measure of vehicle activity, not a measure of "monitoring opportunities." While staff did not change the language to reflect conditions under which the manufacturers' monitors would run and complete, staff clarified the high-load purging conditions under which the denominator would increment. Specifically, staff is proposing that, among other conditions, "high-load purging conditions" occur when the engine manifold pressure is greater than or equal to 7 kilopascals (kPa) above atmospheric pressure. This would help to exclude lower load conditions where small amounts of purging may briefly occur through the high-load line, but include most conditions in which purging occurs through these lines during high-load conditions.

Further, staff is also proposing to change the minimum in-use monitor performance ratio requirement for these monitors in section 1968.2(d)(3.2.1), now requiring them to meet a ratio of 0.100 through the 2020 model year, and a ratio of 0.336 starting in the 2021 model year. Third, staff added language clarifying the denominator incrementing requirements for high-load purge monitors on hybrid vehicles, since this was not sufficiently addressed. The language in section 1968.2(d)(4.3.2)(M) proposed as part of the 45-day changes indicated that the requirements of section 1968.2(d)(4.3.2)(B) have to be met, even though hybrid vehicles must use the criteria of 1968.2(d)(4.3.2)(K) in lieu of the criteria in 1968.2(d)(4.3.2)(B). Staff is proposing amendments that would clarify this.

7. Section 1968.2(d)(4.3.2)(L): This section describes the requirements for incrementing the evaporative system monitor denominators (including the denominator for the purge flow monitor under section 1968.2(e)(4.2.2)(A)) for plug-in hybrid electric vehicles. The requirements include the criteria under sections 1968.2(d)(4.3.2)(K)(i) through (iii), which do not require any fueled engine operation to increment the denominator. Manufacturers have indicated that purging, and thus purge flow monitoring, requires the engine to run. To be consistent with other monitors that require the engine to run, staff is proposing that the evaporative system purge flow monitor increment the denominator when the criteria under sections 1968.2(d)(4.3.2)(K)(i) through (iv) (which include the fueled engine operation condition) are met in addition to the criteria under section 1968.2(d)(4.3.2)(L).

8. Section 1968.2(d)(7.2): As part of the 45-day notice, staff proposed new language clarifying that manufacturers of vehicles that "are equipped with components/systems defined by any of the monitoring requirements in section (e) and components/systems defined by any of the monitoring requirements in section (f)" are required to submit a plan for meeting the OBD II requirements, since they may not cleanly fit under just the gasoline requirements or just the diesel requirements. The language was intended to give manufacturers more details on what is required for technologies used on a certain vehicle but not detailed under the requirements for such vehicles (e.g., a gasoline vehicle using a selective catalytic reduction (SCR) system traditionally used on diesel vehicles and with specific detailed requirements in the diesel monitoring requirements). Without the proposed language, such monitoring requirements would need to be proposed by the manufacturer under the gasoline "other emission control or source system" monitoring requirements with no guidelines as to what kind of plan is acceptable. Further, the vehicle may neglect to output the necessary standardized parameters needed to troubleshoot failures of the technology since they are not required for such vehicles in the regulation (e.g., section 1968.2(g)(4.2) requires data stream parameters related specifically to diesel technologies such as SCR systems and particulate matter (PM) filters to be made available only on diesel vehicles, not gasoline vehicles). Manufacturers, however, have expressed confusion about the

language, specifically about what diesel requirements would be applied to a gasoline vehicle and vice versa, and are concerned that certain requirements would be inappropriately required on certain vehicles (e.g., requiring air-fuel ratio cylinder imbalance monitoring on diesel vehicles). There was also confusion about what requirements would apply for technologies traditionally present on both gasoline and diesel vehicles but with different monitoring requirements in each section of the regulation (e.g., exhaust gas recirculation (EGR) systems). Staff is proposing to modify the language clarifying which requirements should be considered for gasoline and diesel vehicles respectively. Staff would also like to note that while the intent was not to impose new monitoring requirements on current gasoline and diesel vehicles, the expectation is that section 1968.2(d)(7.2) will provide guidance to manufacturers on the elements required in the monitoring plan if current technology becomes OBD relevant in the future because the technology has become an important part of the emission control solution. For example, components or systems that exceed the thresholds for other required monitors would clearly be OBD relevant and need to be included in a monitoring plan.

9. Section 1968.2(e)(4.2.8)(A)(ii): As part of the 45-day notice, staff proposed amendments in section 1968.2(e)(4) that addressed high-load purge flow monitoring, including language allowing manufacturers to be exempt from monitoring purge flow through the high-load purge line if the purge mass flow through this line is 0 percent of the total purge mass flow to the engine on the Unified cycle and less than 1 percent of the total purge mass flow to the engine on the US06 cycle. Manufacturers have argued that the 0 percent and 1 percent criteria were too low and should be higher, and that the Federal Test Procedure (FTP) cycle is more appropriate to use than the Unified cycle since total purge masses are not typically measured on the Unified cycle. When manufacturers first brought up this issue during the regulatory development process, staff asked manufacturers to propose new percentage criteria and provide data supporting the proposal, but manufacturers have not provided such a proposal or data. Considering high-load purging will more likely occur during conditions encountered on the US06 cycle instead of the FTP or Unified cycles, staff believes that only the criterion tied to the US06 cycle is necessary. Staff is proposing to delete the criterion tied to the Unified cycle and to allow exemption from monitoring if the purge mass flow through the high-load line is less than 1 percent of the total purge mass flow to the engine on the US06 cycle.

10. Section 1968.2(e)(6.2): As part of the 45-day notice, staff proposed new language in section 1968.2(e)(6.2.6) requiring OBD II systems to indicate a fault when the fuel system fails to enter closed-loop operation within a certain time for vehicles that employ engine shutoff strategies that do not require the vehicle operator to restart the engine to continue driving. Manufacturers have expressed confusion about the difference between this new requirement and the requirement in section 1968.2(e)(6.2.4), which also requires manufacturers to indicate a fault when the fuel system fails to enter closed-loop operation within a certain time. Staff agrees that

the requirements in sections 1968.2(e)(6.2.4) and (6.2.6) are similar, though section 1968.2(e)(6.2.6) was intended to specifically ensure that vehicles that can restart the engine multiple times during a driving cycle monitor for this fault after every engine restart. Staff is proposing to clarify the requirements by moving the language in section 1968.2(e)(6.2.6) to 1968.2(e)(6.2.4). Further, manufacturers expressed concern that the requirements in section 1968.2(e)(6.2.4) were not reflective of the current certification allowances, specifically the ability to demonstrate compliance using a component-level monitoring strategy that is as timely in detecting faults as an overall system-level monitor. Staff agrees that the language should reflect the current flexibilities in monitoring strategies and is proposing to clarify the requirements in section 1968.2(e)(6.2.4). Staff is also proposing to clarify this section is related to failure to enter "stoichiometric" closed-loop operation, and is proposing to require this to be phased-in during the 2019 through 2021 model years.

As part of the 45-day notice, staff deleted section 1968.2(e)(6.2.5), which allowed manufacturers to adjust the malfunction criteria or limits during conditions that will not provide for robust detection of faults, since staff believed it was unnecessary anymore considering staff also adopted new language in section 1968.2(e)(6.3.5) allowing for disablement of the fuel system monitor during conditions such as those described in section 1968.2(e)(6.2.5). A manufacturer, however, indicated that it did use the requirement to adjust their malfunction criteria for the fuel system monitor and requested that the language not be deleted. Thus, staff is proposing to reinsert the preexisting text into section 1968.2(e)(6.2.5).

11. Section 1968.2(e)(8.2.4): As part of the 45-day notice, staff added language requiring manufacturers to detect a functional "too high flow" fault of the EGR system if a fault that causes an increase in flow does not cause emissions to exceed a specific threshold. Manufacturers have requested that they be exempt from monitoring this fault in the event that such an EGR fault causes the vehicle to stall. Staff agrees that where the EGR failure or deterioration cannot be detected because the vehicle has immediately stalled during idle conditions, monitoring is not required. However, manufacturers must demonstrate that the failure or deterioration would be detected under all other driving conditions, or provide data indicating why the failure or deterioration can only be detected under idle conditions. Staff is proposing language to allow for Executive Officer approval to not detect these EGR faults because the vehicle stalls at idle.

12. Sections 1968.2(e)(9) and (f)(10): As part of the 45-day notice, staff modified the requirements for gasoline PCV and diesel CV system monitoring to address several issues with the current requirements, to reduce staff review of PCV and CV systems by streamlining the requirements, and to ensure the integrity of the overall PCV and CV system. Based on comments from manufacturers indicating several issues with the proposed language, staff is proposing additional changes to these sections. First, staff is proposing to change the reference of "normally aspirated engines" in

section 1968.2(e)(9.2.1) to "naturally aspirated engine," which is the more common terminology used within industry. Second, staff is proposing to change the word "leak" in sections 1968.2(e)(9.2.3)(A) and (B) and (f)(10.2.3)(A) and (B) to "disconnection" and "break," since manufacturers claim that the word "leak" is inappropriate to use when referencing hoses and lines in PCV and CV systems. Third, manufacturers argued that the fresh air line on naturally aspirated engines contains crankcase vapors under high engine air flows and manifold pressures, and that they should not be required to monitor hoses like these that are not designed to transport crankcase vapors. Staff is proposing to delete language in section 1968.2(e)(9.2.3)(A) related to monitoring of PCV system hoses, tubes and lines that do not transport crankcase vapors. Lastly, manufacturers have pointed out that the language appears to require monitoring of any hose, tube or line that transports crankcase vapors, including hoses located downstream from where the crankcase vapors enter the fresh air intake system. Staff intended for the language to state that any hose, tube or line that transports crankcase vapors will be monitored up to where it connects to the fresh air intake air system. Staff is proposing to change the language in sections 1968.2(e)(9.2.3)(B) and (f)(10.2.3)(B) to clarify this.

13. Sections 1968.2(e)(10.1.4) and (f)(11.1.4): As part of the 45-day notice, staff added language requiring manufacturers to propose a monitoring plan for vehicles equipped with a "system other than the cooling system and engine coolant temperature (ECT) sensor" to indicate engine operating temperatures for emission control purposes. Manufacturers have indicated that the language was unclear whether or not this included systems that use other temperature sensors besides the ECT sensor for these purposes. Staff intended the language to include these cases, and revised the language in these sections to clarify that manufacturers of vehicles that use sensors/systems "in addition to" or "in lieu of" the cooling system and ECT sensor are required to propose a monitoring plan for Executive Officer approval. Further, for vehicles that use sensors/systems "in addition to" the cooling system and ECT sensor, staff is proposing that manufacturers phase in these monitors during the 2019 through 2021 model years. Staff also modified the language to clarify that this only involves engine and/or engine component temperature sensors so temperature sensors such as ambient air temperature sensors are not included.

14. Sections 1968.2(e)(10.2.1)(D) and (f)(11.2.1)(D): As part of the 45-day notice, staff added section 1968.2(e)(10.2.1)(B) requiring OBD II systems on gasoline vehicles to detect a fault if the coolant temperature drops below the thermostat monitor threshold temperature after reaching it (with this requirement to be phased in starting in the 2019 model year), while diesel vehicles are currently required to meet this monitoring requirement under section 1968.2(f)(11.2.1)(B). Staff mistakenly forgot to modify sections 1968.2(e)(10.2.1)(D) and (f)(11.2.1)(D) to allow these monitors to use alternate malfunction criteria and/or monitoring conditions that are a function of engine start temperature on vehicles that do not reach the thermostat monitor threshold temperatures even when the thermostat is functioning properly. Staff is

proposing to modify the language in these sections to address this.

15. Sections 1968.2(e)(10.2.2)(B): As part of the 45-day notice, staff made revisions to the engine cooling system monitoring requirements of section 1968.2(e)(10) to account for vehicle designs that use components other than a thermostat for regulation of ECT. However, manufacturers noted there remained confusion regarding the requirements surrounding the time to reach closed-loop enable temperatures in section 1968.2(e)(10.2.2)(B). Specifically, manufacturers noted there could be two conditions under which closed-loop operation is achieved (stoichiometric versus non-stoichiometric), and multiple ECT temperatures for achieving closed-loop depending on engine speed and load. Staff agrees that clarification is needed and is proposing language to clarify that the minimum ECT should be based on achieving "stoichiometric" closed-loop operation across the range of engine loads observed on the FTP cycle. Staff is proposing to require this to be phased-in during the 2019 through 2021 model years.

16. Sections 1968.2(e)(10.3.1)(D) and (E) and 1968.2(f)(11.3.1)(D) and (E): As part of the 45-day notice, staff proposed amendments to these sections to clarify under what conditions the thermostat monitor can be disabled. Staff intended for the new language to apply to only the thermostat monitor for malfunctions under sections 1968.2(e)(10.2.1)(A) and (f)(11.2.1)(A), not the monitor for malfunctions under sections 1968.2(e)(10.2.1)(B) and (f)(11.2.1)(B). Staff is proposing changes to clarify the monitoring condition requirements applicable for each thermostat monitor.

17. Sections 1968.2(e)(15.1.1) and (f)(15.1.1): As part of the 45-day notice, staff proposed new language indicating that for vehicles compensating or adjusting for deterioration or malfunction of the component/system, manufacturers would have to meet the default action requirements specified elsewhere in the regulation. Manufacturers have expressed confusion about the intent of the language. Staff intended for the language to clarify that if the vehicle control system takes a direct action to compensate or adjust in response to detecting a deteriorated or malfunctioning component/system, then this type of response would be considered a default action subject to the requirements of either section 1968.2(d)(2.2.3) or (e)(15.4.4) or (f)(15.4.5) as applicable. Because direct action is being taken in response to the detection of deterioration or malfunction of a component/system, the emission impact of such a component or system cannot be determined using the "test-out" criteria in section 1968.2(e)(15.1.2) or (f)(15.1.2). Thus, staff is proposing to modify the language to indicate that such vehicles are not allowed to use the test-out criteria specified under sections 1968.2(e)(15.1.2) and (f)(15.1.2).

18. Sections 1968.2(e)(15.1.2), (e)(15.4.2), (f)(15.1.2), and (f)(15.4.2): As part of the 45-day notice, staff adopted new criteria (sections 1968.2(e)(15.1.2) and (f)(15.1.2)) that would be used to determine the emission impact of a comprehensive component and whether or not the component needs to be monitored. Staff also proposed

modifications to sections 1968.2(e)(15.4.2) and (f)(15.4.2), which describes the emission impact-based criteria under which a comprehensive component monitor is exempt from illuminating the MIL, with the proposal prohibiting usage of these criteria for LEV III applications. Manufacturers have requested the ability to conduct an engineering evaluation in lieu of providing actual vehicle test data to meet sections 1968.2(e)(15.1.2) and (f)(15.1.2) to reduce the testing burden. Staff agrees that the test burden could become large and is proposing to allow manufacturers to conduct an engineering evaluation demonstrating that no malfunction of the component or system in question could cause an increase in vehicle emissions under any reasonable in-use driving conditions. Manufacturers have also requested the option to use the new criteria under sections 1968.2(e)(15.1.2) and (f)(15.1.2) in lieu of the criteria under sections 1968.2(e)(15.4.2) and (f)(15.4.2) on non-LEV III applications (e.g., LEV II applications). They also requested that vehicles with components/systems determined not to affect emissions (i.e., for which manufacturers provided emission data showing malfunctions of the component/system will not cause a measurable increase in emissions) in a previous model year and carried over to a later model year be allowed to carry over their emission test-out data and be waived from meeting the new criteria of sections 1968.2(e)(15.1.2) and (f)(15.1.2) for the later model years. Considering the timing of this rulemaking update, staff agrees and is proposing language to include these allowances. For the former request, staff is proposing changes to sections 1968.2(e)(15.4.2) and (f)(15.4.2) applying these sections to vehicles not using the criteria of sections 1968.2(e)(15.1.2)(A) through (E) and (f)(15.1.2)(A) through (E) to determine if a component/system can affect emissions. For the latter request, staff is proposing new sections 1968.2(e)(15.1.2)(F) and (f)(15.1.2)(F) allowing manufacturers of vehicles certified in the 2017 or earlier model year and carried over to the 2018 through 2019 model year to carry over any emission test-out determinations from the 2017 and earlier model years. Further, considering the timing of this regulatory update, staff is also proposing new sections 1968.2(e)(15.1.2)(G) and (f)(15.1.2)(G) indicating that manufacturers need not meet the requirements of sections 1968.2(e)(15.1.2)(A) through (E) and (f)(15.1.2)(A) through (E) on vehicles certified in the 2017 model year or earlier (though they may do so on 2017 model year vehicles).

19. Sections 1968.2(e)(15.2.1)(B) and (f)(15.2.1)(B): As part of the 45-day notice, staff proposed new language clarifying the fault code storage requirements for input components. The language required separate fault codes for "each distinct malfunction (e.g., out-of-range low, out-of-range high, open circuit, shorted high, shorted low, etc.)." Manufacturers have argued that requiring separate fault codes to distinguish out-of-range faults from circuit faults has never previously been required by ARB, is unnecessary, and would result in hundreds of new fault code assignments. Staff, however, did not intend to require manufacturers to store separate fault codes distinguishing these faults, and only added these examples to account for manufacturers that choose to store separate fault codes. To avoid

further confusion, staff is proposing to delete "shorted high" and "shorted low" from the examples cited in sections 1968.2(e)(15.2.1)(B)(ii) and (f)(15.2.1)(B)(ii).

20. Section 1968.2(e)(15.2.1)(D): As part of the 45-day notice, staff proposed new language clarifying that manufacturers are required to monitor input components that are directly or indirectly used for any emission control strategies, and included as an example a fuel rail pressure sensor used for a control strategy that regulates fuel pressure. Manufacturers commented that the example was inappropriate. Staff is proposing to substitute the fuel rail pressure sensor example with the example of an exhaust gas temperature sensor used for a control strategy that regulates catalyst inlet temperature within a target window.

21. Sections 1968.2(e)(15.2.2)(A) and (f)(15.2.2)(A): As part of the 45-day notice, staff proposed changes clarifying the monitoring requirements of comprehensive components that are inputs to or outputs from smart devices. In the Initial Statement of Reasons (ISOR), staff included a table describing all the monitoring requirements for input and output components, and did not propose specific changes related to this in sections 1968.2(e)(15.2.2)(A) and (f)(15.2.2)(A) for output components since staff believed the current language sufficiently covered all the monitoring requirements. However, while the ISOR specifically mentioned that digital output components had to be monitored for communication faults, staff overlooked that the current language in regulation did not specifically clarify this. Therefore, staff is proposing to include language in these sections indicating that the OBD II system is required to detect communication faults for digital output components.

22. Sections 1968.2(e)(15.2.3)(B)(ii) and (f)(15.2.3)(B)(ii): As part of the 45-day notice, staff proposed new language clarifying the monitoring requirements for hybrid vehicles, including the requirements for hybrid thermal management systems. The proposed language exempts monitoring of electronic components commanded solely by driver demand (e.g., air conditioning components commanded only by the driver for cooling the cabin) and used for energy storage system (ESS) thermal management. Staff did not allow a similar exemption for inverter thermal management systems since staff had believed such systems generally use "active" systems that use dedicated components commanded by the vehicle for proper cooling and heating of the inverter. Some manufacturers, however, have indicated that their inverter thermal management systems instead use "passive" systems similar to those of ESS thermal management systems, where they use cabin air to cool the inverter. Therefore, staff is proposing to add language allowing the same monitoring exemption for such inverter thermal management systems.

23. Sections 1968.2(e)(15.2.3)(H) and (f)(15.2.3)(H): As part of the 45-day notice, staff proposed amendments in sections 1968.2(e)(15) and (f)(15) proposing specific monitoring requirement language for hybrid components on hybrid vehicles. Manufacturers have indicated that the language is not clear whether or not hybrid

vehicles can use the emissions "test-out" criteria under sections 1968.2(e)(15.1.2) and (f)(15.1.2) to be exempt from monitoring specific hybrid components. Staff intended for manufacturers to be able to use these provisions on hybrid vehicles except for plug-in hybrid electric vehicles, which are subject to the criteria under sections 1968.2(e)(15.2.3)(I) and (f)(15.2.3)(I) (originally proposed as 1968.2(e)(15.2.3)(H) and (f)(15.2.3)(H) as part of the 45-day notice)), and is proposing new language in sections 1968.2(e)(15.2.3)(H) and (f)(15.2.3)(H) to make this clear.

24. Sections 1968.2(e)(17.1.3) and (f)(17.1.2): These sections describe the malfunction criteria manufacturers are required to use on vehicles certified to the Tier 2 Federal Bin 3 or 4 tailpipe emission standards. The U.S. EPA Tier 3 standards include several provisions applicable during the Tier 3 phase-in period. One provision includes transitional Tier 3 bins. Two transitional Tier 3 bins—Bin 110 and Bin 85, that have FTP non-methane organic gases (NMOG)+NOx standards of 110 mg/mi and 85 mg/mi, which are the sum of the NMOG and NOx values from the Tier 2 Bins 3 and 4, respectively —are available through the 2019 model year. Further, the associated FTP standards for carbon monoxide (CO) and PM corresponding to these bins are identical to those for vehicles certified to the LEV III ULEV125 standards. While staff proposed new malfunction criteria for vehicles certified to the LEV III tailpipe emission standards in sections 1968.2(e) and (f) as part of the 45-day notice, staff mistakenly did not address vehicles certified to the Tier 3 Federal Bin 85 and Bin 110 tailpipe emission standards. As such, OBD thresholds must be defined for these transitional bins, so staff is proposing malfunction criteria for these bins for both gasoline and diesel vehicles in sections 1968.2(e)(17.1.3) and (f)(17.1.2). For the CO and PM thresholds, staff is proposing that the transitional Tier 3 bins use the same multipliers as those currently proposed for the corresponding LEV III ULEV125 standards. The NMOG+NOx threshold was calculated based on the weighted Bin 3 and 4 standard contribution to the Tier 2 OBD threshold in effect for Bins 3 and 4, which is 2.5 times NOx and 1.5 times NMOG. This calculation resulted in a 1.85 NMOG+NOx multiplier for all monitors (including the PM filter filtering performance monitor) except the gasoline catalyst monitor and diesel aftertreatment monitors, which would have a 2.0 NMOG+NOx multiplier instead.

25. Sections 1968.2(e)(17.8), (e)(17.9), (f)(17.7), and (f)(17.8): As part of the 45-day notice, staff proposed language allowing manufacturers to be exempt from monitoring certain components if any failure will only affect emissions or the OBD II system performance during extreme conditions (i.e., when the ambient temperature is below 20 degrees Fahrenheit or when the vehicle speed is above 82 miles-per-hour). Manufacturers have expressed confusion about what exactly these sections are allowing, with some mistakenly believing these sections allow manufacturers to "disable" monitors during these extreme conditions. Staff however intended these sections allow a component to be exempt from <u>all</u> monitoring requirements (i.e.,

allow a component to have no monitors), not allow a required monitor for a component to be disabled during certain conditions. Staff is therefore modifying the language in these sections to make this clearer.

26. Section 1968.2(f)(1.2.3)(B): This section requires OBD II systems to monitor diesel NMHC catalysts used to generate feedgas for proper SCR system operation, but allows manufacturers to be exempt from this requirement if, among other criteria, any failure of this feedgas generation ability cannot cause emissions to exceed 15 percent of the applicable full useful life NMHC, NOx (or NMHC+NOx), CO, or PM standards. Manufacturers have argued this monitoring requirement should be deleted for LEV III applications since the combined NMOG+NOx standards/thresholds already account for any NOx emission impact from the loss the NMHC catalyst efficiency. Staff was concerned that deleting this requirement could allow full loss of NMHC feedgas generation capability and an increase in emissions close to the emission threshold without any detection of a fault. However, staff acknowledges that the current criteria for monitoring exemption is difficult to achieve at the lower ULEV and SULEV emission levels to which manufacturers will certify. Staff is proposing amendments to the monitoring exemption language to allow manufacturers to more easily be exempt from monitoring the feedgas generation function of these catalysts. Specifically, staff is proposing to increase the maximum emissions increase criteria for monitoring exemption from 15 percent to these values: 25 percent for SULEV30 and SULEV20 vehicles, 20 percent for ULEV70 and ULEV50 vehicles, and 15 percent for all other vehicles, where the percentage is based on the applicable full useful life NMHC, NOx (or NMOG+NOx, if applicable), CO, or PM standard as measured from an applicable emission test cycle.

27. Sections 1968.2(f)(2.2.2)(A) and (B), (f)(2.2.3)(A), (f)(8.2.1)(A) and (B), (f)(9.2.1)(A) and (B), (f)(9.2.2)(B), and (f)(9.2.4)(A): The language in these sections mistakenly refers to specific emissions (e.g., "NMHC emissions," "PM emissions") while the newly proposed malfunction criteria for LEV III applications, which are referenced in these sections, include emission thresholds for all four emission constituents (NMHC+NOx, CO, and PM emissions). Staff is proposing to correct the language in these sections.

28. Section 1968.2(f)(3.3.3)(D): This section allows manufacturers to disable diesel misfire monitoring during conditions where false detections may occur. While the gasoline misfire monitor requirements (section 1968.2(e)(3.3.4)(B)) contain specific language allowing manufacturers to disable the gasoline misfire monitor until the ECT exceeds 70 degrees Fahrenheit when the ECT at start is below 20 degrees Fahrenheit, the diesel misfire monitor requirements (section 1968.2(f)(3.3)) do not include this specific language. Manufacturers have requested to disable their diesel misfire monitors during the same conditions, indicating that engine roughness can be significantly higher at cold temperatures compared to warmer temperatures, which may result in false misfire detections, and that false detections may still occur

when the ECT increases above 20 degrees Fahrenheit because the engine oil temperature increases slowly. Staff agrees and is proposing to revise the language to allow such a disablement for diesel misfire monitors.

29. Section 1968.2(g)(1): Staff is making available recently updated versions of the technical standards SAE J1962 "Diagnostic Connector – Equivalent to ISO/DIS 15031-3:December 14, 2001," SAE J1699-3 "Vehicle OBD II Compliance Test Cases," and SAE J2534-1 "Recommended Practice for Pass-Thru Vehicle Programming." As is common practice with technical standards, industry periodically updates the standards to add specification or clarity and the references in the regulation have been updated to refer to the latest versions. Specifically, the regulation would now incorporate the September 2015 version of SAE J1962, the July 2015 version of SAE J1699-3, and the October 2015 version of SAE J2534-1.

30. Section 1968.2(g)(2): As part of the 45-day notice, staff proposed changes requiring the diagnostic connector to meet the "Type A" specifications of the July 2012 version of SAE J1962 starting in the 2019 model year. As mentioned above, staff is proposing to now incorporate the September 2015 version of SAE J1962. Staff, however, has an issue about the language in this SAE document, which appears to allow manufacturers the option to meet minimum mounting feature requirements for the vehicle connectors instead of requiring these features be met. The mounting feature requirements of concern require the vehicle connector to withstand a force of 220 Newtons. Industry has indicated that the specifications in SAE J1962 will be updated to clarify that the mounting feature is required. In the meantime, staff is proposing to modify the language in section 1968.2(g)(2.2), requiring vehicles meeting the Type A specifications of the September 2015 version of SAE J1962 to also meet this mounting feature requirement. Further, manufacturers have requested additional leadtime to meet the Type A specifications of SAE J1962, indicating that requiring all vehicles to meet the requirements by the 2019 model year is burdensome and would result in unnecessary high costs to implement the significant hardware changes needed on a few low volume models that are phasing out. Staff agrees and is thus proposing that manufacturers phase-in this requirement (meeting the Type A specifications in the 2015 version of SAE J1962) during the 2019 through 2021 model years, allowing for alternate phase-in schedules with the exception that 100 percent of vehicles are required to meet the requirements by the 2021 model year.

31. Section 1968.2(g)(4.2): This section describes the data stream parameters that vehicles are required to make available. First, manufacturers have expressed confusion about what data stream parameters were required in which vehicles. Staff is therefore proposing modifications to the section to clarify the requirements. Second, staff is proposing to add a few more data stream parameters vehicles are required to reported: test group or engine family for all vehicles (to be phased in starting in the 2019 model year) and NOx sensor output for all 2019 and subsequent

model year gasoline vehicles so equipped. For the test group or engine family parameter, staff realized that without adding test group or engine family, there would be no straightforward way to link the information collected through data stream to the standards to which the vehicle was certified. For the NOx sensor output, while staff proposed to require gasoline vehicle so equipped to output the "NOx sensor corrected" parameter as part of the 45-day notice, staff mistakenly forgot to also require the vehicles to output the "NOx sensor output" parameter in conjunction with this proposed parameter. Third, as part of the 45-day notice, staff proposed that 2019 and subsequent model year diesel vehicles output the "DEF dosing percent duty cycle" parameter to assist staff in certification and OBD II compliance testing. Manufacturers have indicated this is not the appropriate parameter, and that the parameters "commanded DEF dosing" and "DEF usage for the current driving cycle" are more appropriate. Staff is proposing to delete the "DEF dosing percent duty cycle" and include these two new parameters. Fourth, as part of the 45-day notice, staff proposed language in section 1968.2(g)(4.2.8) (which is now section 1968.2(g)(4.2.4)) requiring manufacturers to report the "most accurate values" for certain parameters intended to help facilitate portable emission measurement systems (PEMS) testing. Manufacturers indicated that the definition of "most accurate value" contained in the proposed language is vague in what constituted "sufficient accuracy, resolution, and filtering to be used for the purposes of in-use emission testing." Manufacturers further indicated that the language was not needed considering SAE J1979 already contains detailed specifications for the parameters developed by the vehicle/engine manufacturers and PEMs equipment manufacturers. Staff included the proposed language, however, to address issues with vehicles that keep track of more than one value of the same parameter but output to a scan tool the least accurate of the values for that parameter. Staff is keeping the language. Staff is proposing to delete the specific sentence that defined the "most accurate value."

32. Section 1968.2(g)(4.7.4): As part of the 45-day notice, staff proposed language clarifying the requirements for making the calibration verification number (CVN) available to a scan tool, including language indicating that the on-board computer may not respond with a default CVN value. Manufacturers have stated that SAE J1979 provides clear direction on how a control unit should respond when data are not available from an OBD device that communicates over a network, with the general principle being that a "default" value easily identified as "not normal" would be reported to indicate if a device has failed (e.g., there is a communication failure with the specific control unit). They indicated that prohibiting default CVN values and requiring the control unit to report the stored valid CVN value when a communication failure occurs would confuse repair technicians. While staff understands the manufacturers' concern, staff wants to limit the output of default CVN values. Staff is proposing to allow a default CVN value to be reported to a scan tool where a communication malfunction occurs that prevents access to the stored CVN value provided that (1) a pending fault code is stored or a confirmed

fault code is stored with the MIL commanded on for the communication failure of the module, and (2) the default CVN value reported to the scan tool cannot be mistaken for a valid CVN value.

33. Section 1968.2(g)(4.10): As part of the 45-day notice, staff proposed language requiring OBD II systems to erase certain "emission-related diagnostic information" from all control modules if commanded by a scan tool or if the power to the on-board computer is disconnected starting in the 2019 model year. Staff is proposing a few additional changes to this section based on manufacturers' input regarding the language. First, staff is proposing to add language indicating that the "emission-related diagnostic information" is required to include "at least" the information described in section 1968.2(g)(4.10.1) to address confusion among manufacturers about what information are required to be included. Second, staff is proposing to add the data stream information "monitor status" to the information described in section 1968.2(g)(4.10.1) to align with the requirements in SAE J1979. Third, manufacturers have expressed concern about the language requiring that the information from "all" control units be erased, indicating that "physical code clears" (i.e., clearing of information in only specific control units but not all control units) are routinely used by repair technicians when fixing vehicles, and that prohibiting physical code clears would hinder proper repair of vehicles. They further indicated this requirement seemed intended to prevent cheating during an inspection and maintenance (I/M) test, and this requirement is not needed since permanent fault codes would prevent such cheating. Staff disagrees, since there are too many issues with improper implementation of permanent fault codes in vehicles for them to be the basis for fraud prevention in I/M testing today. However, to alleviate manufacturers' concern, staff is proposing to limit the information erasure to control units that reported supported readiness for a readiness bit other than the comprehensive component readiness bit. This would allow manufacturers to erase information only in secondary control units that only support monitors for comprehensive components. Fourth, to address manufacturers' concerns about insufficient leadtime, staff is proposing to modify the start date to meet the requirements of section 1968.2(g)(4.10.2) from 2019 model year to a phase-in during the 2019 through 2021 model years.

Finally, manufacturers have indicated confusion about the language in section 1968.2(g)(4.10.3), which they believed required manufacturers to seek Executive Officer approval to erase the emission-related diagnostic information during conditions other than key on, engine-off conditions (e.g., while the engine is running) – specifically, that manufacturers are not allowed to erase the information during conditions such as engine-running conditions without approval. This is not the intent. Section 1968.2(g)(4.10.2) allows for the OBD II system to erase the information (in response to a scan tool command) during any driving conditions if the information can be erased while the vehicle is in the key on, engine-off position, while section 1968.2(g)(4.10.3) is intended to allow manufacturers to forgo erasing

the information during key on, engine-off conditions for safety or component protection reasons. Staff is proposing to change the language in section 1968.2(g)(4.10.3) to clarify this.

34. Section 1968.2(g)(5.2.1)(B): As part of the 45-day notice, staff proposed to require OBD II systems to store in-use monitor performance ratio data in non-volatile random access memory (NVRAM) starting in the 2019 model year. Manufacturers have indicated that meeting these new requirements would require manufacturers to consume considerable NVRAM resources, since manufacturers would need to store all individual numerators and denominators for each applicable monitor. Staff is proposing to delete this requirement and allow OBD II systems to continue storing the data in keep alive memory.

35. Section 1968.2(g)(6): As part of the 45-day notice, staff proposed to require OBD II systems on 2019 and subsequent model year vehicles to support additional parameters needed to help verify advanced vehicle and powertrain technologies being deployed to meet ARB's stringent GHG emission standards deliver the expected GHG benefits and consumer fuel savings in the real world. Due to several issues brought up by manufacturers regarding the proposed language, staff is proposing additional changes to the language to address these concerns. First, staff is proposing to change the implementation dates in sections 1968.2(g)(6.3), (6.4), and (6.5) from 2019 model year start dates to 3-year phase-in schedules for the 2019 through 2021 model years to give manufacturers additional time to implement this new data. Second, staff is proposing changes to the names of several parameters (e.g., changing "cumulative" to "total") in sections 1968.2(g)(6.3) and (6.4) to provide additional clarity in areas where manufacturers had indicated the possibility of misinterpretation. Third, staff is proposing to delete additional descriptive text for several parameters in sections 1968.2(g)(6.3) and (6.4) and delete most of the detailed numerical specifications for each counter in section 1968.2(g)(6.6.2) since the detailed specifications for each parameter (including the units and software implementation details) are being incorporated in SAE J1979 consistent with where a similar level of detail for other required data parameters is provided. Fourth, staff is proposing to require plug-in hybrid electric vehicles to report a new parameter in section 1968.2(g)(6.4), the "total grid energy into the battery," since discussion with industry regarding further technical specifications of the other parameters specified for plug-in hybrid vehicles identified the need for this additional parameter to complement the other required parameters. Fifth, due to manufacturers' concerns about the proposed requirement to store the vehicle operation data in NVRAM given their limited available NVRAM and a risk of potentially requiring new hardware, staff is proposing to delete this proposed requirement and allow OBD II systems to store the data in keep alive memory. Sixth, since the language in section 1968.2(g)(6.6.2)(B) was unclear which counter(s) required overflow protection if it reaches the maximum value, staff is proposing modifications to clarify this protection strategy is applicable only to the

"lifetime" counters. The counters representing "recent operation" are already required to be reset every 50 hours and accordingly, do not need a similar overflow protection strategy. Last, staff proposed new language, sections 1968.2(g)(6.9) through (6.11), to address manufacturers' concerns about data security and privacy related to the new parameters. The proposed language would clarify that the data would be obtained by voluntary and informed consent of the vehicle operator and the data will be collected and stored in a manner that would prevent tying the data to a specific vehicle or registered vehicle owner. The proposed language would also indicate that the vehicle manufacturer is not obligated to collect the data or provide it to any party other than ARB. Further, the proposed language includes a statement indicating the data would reflect vehicle operation that may not correspond to regulated test procedures, thus the data cannot be used to determine compliance with other requirements such as the GHG standards.

36. Section 1968.2(h)(5.2.3): As part of the 45-day notice, staff proposed language clarifying the certification demonstration testing procedure. The proposed language included a clause that prohibited manufacturers from including "any other test cycle (e.g., preconditioning cycle) prior to running the exhaust emission cycle." This was intended to prevent manufacturers from carrying over "preconditioning cycles" that were approved for showing compliance with the tailpipe emissions standards and using those cycles to detect the implanted malfunction. Manufacturers however mistakenly believed the reference to "preconditioning cycle" in section 1968.2(h)(5.2.3) referred to those allowed for OBD II certification demonstration testing under section 1968.2(h)(5.1). Staff is proposing language to clear up the confusion.

37. Section 1968.2(h)(5.3.2): As part of the 45-day notice, staff proposed to require manufacturers to collect certain data prior to each engine shutdown in the certification demonstration test sequence. However, staff mistakenly included emission data as part of the required data, which was not the intent. Therefore, staff is proposing to modify the language to correct this and to specifically indicate that the manufacturer is required to collect the emission data only during the exhaust emission test.

38. Section 1968.2(i)(2.26): As part of the 45-day notice, staff proposed language requiring manufacturers to submit a list of comprehensive components that are not OBD II monitored due to meeting test-out criteria (including the criteria in sections 1968.2(e)(15.1.2) and (f)(15.1.2)) contained in the OBD II regulation, and the associated data used to meet the test-out criteria. Staff is proposing changes to sections 1968.2(e)(15.1.2) and (f)(15.1.2) allowing manufacturers to conduct an "engineering evaluation" in lieu of the prescribed testing requirements. Staff is proposing additional language in section 1968.2(i)(2.26) allowing manufacturers to submit this "engineering evaluation analysis" in lieu of any test data for these components.

39. Section 1968.2(i)(2.29): Manufacturers have indicated that certification documentation requirements of the OBD II regulation do not currently include information that a monitor runs during conditions other than those encountered on the FTP or Unified cycles, as allowed under section 1968.2(d)(3.1.3). Staff is proposing language in section 1968.2(i)(2.29) requiring manufacturers to provide this information as part of the certification documentation section.

40. Besides the modifications described above, additional modifications correcting section references have been made in several sections of the regulation.

Modifications to OBD II Enforcement Regulation (section 1968.5)

41. Section 1968.5(a)(3): Staff is proposing changes to the definition of "Nonconforming OBD II System." Details about the proposed changes are provided below in the discussion regarding modifications to the "emission standard" definition in various regulations.

42. Section 1968.5(b)(6)(B)(i): This section describes the criteria for determining nonconformance for OBD II ratio testing of monitors certified to the 0.100 ratio. As part of the 45-day notice, staff revised this section to indicate that the 2021 model year is the latest model year allowed to be certified to a ratio of 0.100 (under section 1968.2(d)(3.2.1)(D)). However, staff overlooked that the latest model year is 2027, which staff proposed to allow for the gasoline PCV and diesel CV monitors in section 1968.2(d)(3.2.1)(D)(vii) as part of the 45-day notice. Therefore, staff is proposing to modify the language in section 1968.5(b)(6)(B)(i)a. to correct this.

Other Minor Modifications to OBD II and OBD II Enforcement Regulations (sections 1968.2 and 1968.5)

43. Besides the modifications described above, modifications correcting grammar, punctuation, and spelling, and modifications clarifying requirements have been made throughout the proposed changes. These changes are non-substantive.

Modifications to Definition of "Emission Standard", "Exhaust Emission Standard" and "Evaporative Emission Standard" in Various Regulations (sections 1900, 1956.8, 1968.2, 1971.1, and 2485 of title 13, CCR, and sections 95302 and 95662 of title 17, CCR); Modifications to Definition of "Nonconforming OBD II System" (section 1968.5) and "Nonconforming OBD System" (section 1971.5)

In 2010, ARB adopted amendments to California's Heavy-Duty Engine On-Board Diagnostic System (HD OBD) regulation (section 1971.1 of title 13, CCR) and also adopted a new regulation entitled "Enforcement of Malfunction and Diagnostic System Requirements for 2010 and Subsequent Model-Year Heavy-Duty Engines" (HD OBD

Enforcement regulation)(section 1971.5 of title 13, CCR). The HD OBD Enforcement regulation established detailed in-use testing procedures for HD OBD systems installed in 2010 and subsequent model year engines and included provisions that, among other things, require engine manufacturers to procure and test in-use heavy-duty engines equipped with HD OBD systems to demonstrate that such systems are properly functioning in use. The HD OBD Enforcement regulation further provides that noncompliant HD OBD systems are subject to corrective measures, including recall. The HD OBD Enforcement regulation established enforcement procedures that are comparable to the preexisting enforcement procedures applicable to OBD II systems in light-duty and medium-duty vehicles and engines (section 1968.5 of title 13, CCR).

Shortly after the 2010 Amendments to the HD OBD regulation and the HD Enforcement regulation became effective under California law, a lawsuit was filed that challenged the in-use testing and recall provisions of the HD OBD regulation, and that sought a judicial declaration that the challenged provisions were in excess of ARB's statutory authority.

In 2012, a trial court ruled that ARB had neither general nor specific authority to require manufacturer self-testing of in-use engines or the ability to recall engines that were determined to be in noncompliance with the HD OBD regulation. In determining the latter issue, the trial court found that the OBD requirements were not emission standards and therefore could not be recalled under Health and Safety Code §43105. ARB timely appealed the trial court's judgment.

While the lawsuit was proceeding on appeal, ARB amended the definition of "emission standard" applicable to both HD OBD systems (section 1971.1 of title 13, CCR) and OBD II (section 1968.2 of title 13, CCR) systems to conform the preexisting statutory definition of that term in Health and Safety Code section 39027[1] with the definition of standard as it applies to emissions from motor vehicles and motor vehicle engines under Title II of the federal Clean Air Act, as defined by the United States Supreme Court in *Engine Manufacturers Association v. South Coast Air Quality Management District* (2004) 541 U.S. 246. There, the U.S. Supreme Court clarified that an emission standard, regarding motor vehicles and motor vehicle engines, is a standard that relates to the emission characteristics of a vehicle or engine, and that, for compliance requires a motor vehicle or motor vehicle engine to emit no more than a certain amount of a given pollutant, be equipped with a certain type of pollution-control device, or have some other design feature related to the control of emissions. ARB further adopted new definitions of "evaporative emission standards" and "exhaust emission standards" to identify subcategories of the revised definition of emission standard. ARB also revised the definition of "Nonconforming OBD II System" in the OBD II enforcement regulation (section 1968.5(a)(3) of title 13, CCR) and "Nonconforming OBD System" in the HD OBD enforcement regulation (section 1971.5(a)(3) of title 13, CCR) to reference the new definition of emission standard.

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1 " 'Emission standards' means specified limitations on the discharge of air contaminants into the atmosphere."

In October 2013, the plaintiff challenging ARB's HD OBD Enforcement regulation and a second plaintiff filed separate lawsuits that challenged ARB's authority to amend the definition of "emission standard."

In December 2013, ARB approved five separate, but related rulemaking actions establishing requirements for heavy-duty engines and heavy-duty vehicles: GHG Regulations for Medium- and Heavy-Duty Engines and Vehicles (Phase 1 GHG regulation), Optional Reduced Emission Standards for Heavy-Duty Engines, and amendments to the Tractor-Trailer GHG Regulation, Diesel-Fueled Commercial Motor Vehicle Idling Rule, and the Heavy-Duty Hybrid-Electric Vehicles Certification Procedures. ARB also adopted an update to the definitions section of title 13, CCR section 1900(b) that generally applies to all ARB regulations for on-road motor vehicles and motor vehicle engines. In all of these rulemakings, except the amendments to the Heavy-Duty Hybrid-Electric Vehicles Certification Procedures, ARB included essentially identical revised definitions of "emission standard" as previously added to the HD OBD and OBD II regulations.

On November 24, 2014, the Third District Court of Appeal reversed the trial court's decision. *Engine Manufacturers Association v. California Air Resources Board* (2014) 231 Cal.App.4th 1022. The court held that ARB's adoption of both the in-use testing and the recall provisions was consistent with the broad authority that the Legislature granted ARB to reduce vehicle emissions. The court's decision establishes that ARB's authority to adopt the challenged provisions is not dependent upon whether OBD systems are defined as emission standards.

Because of the Court of Appeal's decision, ARB and the plaintiffs challenging ARB's authority to amend the preexisting definition of emission standard in Health and Safety Code section 39027 have agreed to resolve the lawsuits. ARB staff is proposing to delete the current definitions of the term "emission standard," from each of the regulatory provisions to resolve the lawsuits. Staff is also proposing to delete the definitions of the terms "evaporative emission standards" and "exhaust emission standards" or "tailpipe emission standards" since those current definitions identify subcategories of the current definition of emission standard that are not needed given the proposed deletion of the term "emission standard." Finally, staff is proposing to modify the existing definitions of "nonconforming OBD II system" and "nonconforming OBD system" in the OBD II and HD OBD enforcement regulations, respectively, that currently reference the current definition of "emission standard" in sections 1968.2(c) and 1971.1(c) that are now proposed to be deleted.

Additional Incorporated Document(s) Added to the Record

In the interest of completeness, staff has also added to the rulemaking record and invites comments on the following technical standards:

SAE J1962 "Diagnostic Connector – Equivalent to ISO/DIS 15031-3:December 14, 2001," September 2015

SAE J1699-3 – "Vehicle OBD II Compliance Test Cases", July 2015

SAE J2534-1 – "Recommended Practice for Pass-Thru Vehicle Programming", October 2015

As is common practice with technical standards, industry periodically updates the standards to add specification or clarity and the references in the regulation have been updated to refer to the newer versions.

These documents are available for inspection by contacting Nicole Hutchinson or Trini Balcazar, Regulations Coordinators, at (916) 322-6533 and (916) 445-9564 respectively.

Agency Contacts

Inquiries concerning the substance of the proposed regulation may be directed to Leela Rao, Manager, On-Board Diagnostics Program Development Section, at (626) 350-6469 or Adriane Chiu (back-up contact), Air Resources Engineer, On-Board Diagnostics Program Development Section, at (626) 350-6453.

Public Comments

Written comments will be accepted only on the modifications identified in this Notice. Comments may be submitted by postal mail or by electronic submittal no later than 5:00 pm on the due date to the following:

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

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

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

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

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

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

CALIFORNIA AIR RESOURCES BOARD

Richard W. Corey
Executive Officer

Date: March 21, 2016

Attachments

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