

ATTACHMENT II

Proposed 15-Day Modifications to Sections 1968.2 and 1968.5, title 13, California Code of Regulations

Set forth below are proposed modifications to the amendments to sections 1968.2 and 1968.5, title 13, California Code of Regulations (CCR) that were presented to the Board for adoption on September 28, 2006. The original proposed amendments were made available to the public as part of the 45-Day Notice on August 11, 2006. The original proposed amendments are shown in single underline to indicate additions and ~~single strikethrough~~ to indicate deletions made to the existing text that was last amended in 2003. Based on comments received during the supplemental 45-Day comment period, staff has identified additional modifications to be made to the regulations. Some of these additional proposed modifications were made available at the Board Hearing on September 28, 2006; other modifications, consistent with the Board's directive, are being first presented herein as part of the 15-day notice. All of these additional proposed modifications are shown in double underline to indicate additions and ~~double strikethrough~~ to indicate deletions. The italicized, indented commentaries explain the rationale for the additional proposed modifications and are not part of the regulations.

Various portions of the regulations that are not modified by the staff's suggested modifications are omitted from the text shown and indicated by:

“ * * * * ”

1968.2. Malfunction and Diagnostic System Requirements for 2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines (OBD II)

* * * *

(c) DEFINITIONS

* * * *

“Alternate phase-in” is a phase-in schedule that achieves equivalent compliance volume by the end of the last year of a scheduled phase-in provided in this regulation. The compliance volume is the number calculated by multiplying the percent of vehicles (based on the manufacturer’s projected sales volume of all vehicles) meeting the new requirements per year by the number of years implemented prior to and including the last year of the scheduled phase-in and then summing these yearly results to determine a cumulative total (e.g., a three year, 30/60/100 percent scheduled phase-in would be calculated as $(30\% \times 3 \text{ years}) + (60\% \times 2 \text{ years}) + (100\% \times 1 \text{ year}) = 310$). On phase-ins scheduled to begin prior to the 2004 model year, manufacturers are allowed to include vehicles introduced before the first year of the scheduled phase-in (e.g., in the previous example, 10 percent introduced one year before the scheduled phase-in begins would be calculated as $(10\% \times 4 \text{ years})$ and added to the cumulative total). However, on phase-ins scheduled to begin in 2004 or subsequent model years, manufacturers are only allowed to include vehicles introduced up to one model year before the first year of the scheduled phase-in. The Executive Officer shall consider acceptable any alternate phase-in ~~which that~~ results in an equal or larger cumulative total by the end of the last year of the scheduled phase-in; ~~however, and results in ensures that~~ all vehicles ~~subject to the phase-in shall will complying~~ with the respective requirements ~~subject to the phase-in within no later than one two~~ model years following the last year of the scheduled phase-in.

For alternate phase-in schedules resulting in all vehicles complying one model year following the last year of the scheduled phase-in, the compliance volume shall be calculated as described directly above. For example, a 30/60/100 percent scheduled phase-in during the 2010-2012 model years would have a cumulative total of 310. If a manufacturer’s planned alternate phase-in schedule is 40/50/80/100 percent during the 2010-2013 model years, the final compliance volume calculation would be $(40 \times 3 \text{ years}) + (50 \times 2 \text{ years}) + (80 \times 1 \text{ year}) = 300$, which is less than 310 and therefore would not be acceptable as an alternate phase-in schedule.

~~The Executive Officer shall also consider acceptable any alternate phase-in which results in an equal or larger cumulative total by the end of the last year of the scheduled phase-in and results in all vehicles complying with the respective requirements subject to the phase-in within two model years following the last year of the scheduled phase-in; however,~~ For alternate phase-in schedules resulting in all vehicles complying two model years following the last year of the scheduled phase-in, the compliance volume calculation shall be calculated as described directly above and shall also include a negative calculation for vehicles

not complying until one or two model years following the last year of the scheduled phase-in. The negative calculation shall be calculated by multiplying the percent of vehicles not meeting the new requirements in the final year of the phase-in by negative one and the percent of vehicles not meeting the new requirements in the one year after the final year of the phase-in by negative two. For example, if (e.g., in the previous example, 10 percent of a manufacturer's vehicles did not complying in by the final year of the scheduled phase-in and 5 percent did not comply by the end of the first year after the final year of the scheduled phase-in, the negative calculation result would be ~~would be calculated as~~ $(10 * (-1 \text{ years}))$ and 5 percent not complying in the one year after the final year of the phase in would be calculated as $(5 * (-2 \text{ years})) = -20$ and added to the cumulative total). The final compliance volume calculation is the sum of the original compliance volume calculation and the negative calculation. For example, a 30/60/100 percent scheduled phase-in during the 2010-2012 model years would have a cumulative total of 310. If a manufacturer's planned alternate phase-in schedule is 40/70/80/90/100 percent during the 2010-2014 model years, the final compliance volume calculation would be $(40 * 3 \text{ years}) + (70 * 2 \text{ years}) + (80 * 1 \text{ year}) + (20 * (-1 \text{ year})) + (10 * (-2 \text{ years})) = 300$, which is less than 310 and therefore would not be acceptable as an alternate phase-in schedule.

Commentary: The definition of "alternate phase-in" in section 1968.2(c) was modified to clarify the calculation methods that determine if a manufacturer's alternate phase-in plan is acceptable, specifically alternate phase-in plans that result in all vehicles complying with a scheduled phase-in provided in section 1968.2 one or two model years after the last year of the scheduled phase-in. This was done in response to industry confusion over how to appropriately calculate the compliance volume.

* * * *

"Continuously," if used in the context of monitoring conditions for circuit continuity, lack of circuit continuity, circuit faults, and out-of-range values, means monitoring is always enabled, unless alternate enable conditions have been approved by the Executive Officer in accordance with section (d)(3.1.1), and sampling of the signal used for monitoring occurs at a rate no less than two samples per second. If ~~forequal to the rate used for engine~~ control purposes, a computer input component is sampled less frequently, the signal of the component may instead be evaluated each time sampling occurs.

Commentary: After discussions with manufacturers, the staff has retracted most of the original 45-Day amendments that were made to the definition of "continuously" in section 1968.2(c). The original 45-Day proposed amendments included deletions to the phrase "at a rate no less than two samples per second" and to the reference to systems where the computer input component is sampled less frequently than two samples per second for control purposes, since industry

previously indicated that signal sampling for diagnostics was always the same as signal sampling for control purposes and thus, the previously mentioned language was unnecessary. However, subsequent discussions with industry revealed that some manufacturers were still dependent on the deleted language allowing them to sample for diagnostics at a less frequent rate than sampled for control purposes. Additionally, language was added to acknowledge that circuit and out-of range monitors may be disabled during certain conditions approved by ARB, as currently allowed in the regulation, and the word "engine" was deleted from the phrase "engine control purposes" based on manufacturers' input.

* * * *

(d) GENERAL REQUIREMENTS

* * * *

(2) MIL and Fault Code Requirements.

* * * *

(2.2) MIL Illumination and Fault Code Storage Protocol.

* * * *

(2.2.3) The OBD system shall illuminate the MIL and store a fault code within 10 seconds to inform the vehicle operator whenever the powertrain enters a default or "limp home" mode of operation that can affect emissions or the performance of the OBD II system or in the event of a malfunction of an on-board computer(s) itself that can affect the performance of the OBD II system.

(A) If the default or "limp home" mode of operation is recoverable (i.e., the diagnostic or control strategy that caused the default or "limp home" mode of operation can run on the next driving cycle and confirm the presence of the condition that caused the default or "limp home" operation) operation automatically returns to normal at the beginning of the following driving cycle), the OBD II system may, in lieu of illuminating the MIL within 10 seconds on the first driving cycle where the default or "limp home" mode of operation is entered, wait and delay illumination of the MIL only if until the condition causing the default or "limp home" mode of operation is again entered-detected before the end of the next driving cycle-in lieu of illuminating the MIL within 10 seconds on the first driving cycle where the default or "limp home" mode of operation is entered.

Commentary: Based on input from manufacturers, staff is proposing the modification to section 1968.2(d)(2.2.3)(A) to avoid limiting the definition of "recoverable" to just those powertrain operations that automatically return to normal at the beginning of the next driving cycle.

* * * *

(2.5) Erasing a permanent fault code. The OBD II system shall erase a permanent fault code only if either any of the following conditions occur:

(2.5.1) The OBD II system itself determines that the malfunction that caused the permanent fault code to be stored is no longer present and is not

commanding the MIL on, concurrent with pursuant to the requirements of section (d)(2.3) (which for purposes of this section shall apply to all monitors), or

(2.5.2) Subsequent to a clearing of the fault information in the on-board computer (i.e., through the use of a scan tool or battery disconnect), the diagnostic for the malfunction that caused the permanent fault code to be stored has fully executed (i.e., has executed the minimum number of checks necessary for MIL illumination) and determined the malfunction is no longer present component or system is not malfunctioning.

(A) For monitors that are required to run once per driving cycle (e.g., catalyst monitor) or subject to the minimum ratio requirements of section (d)(3.2) (e.g., comprehensive component input component rationality monitors), “fully executed” as used in section (d)(2.5.2) shall mean the monitor has run a sufficient number of times to determine that the component or the system is passing (i.e., run once and passed without indication of a fail for a monitor using the standard MIL and fault code protocol of section (d)(2.2)).

(B) Except as provided for in section (d)(2.5.2)(C) and (D), for monitors that are required to run continuously (e.g., gasoline misfire monitor, fuel system monitor, comprehensive component circuit continuity monitors), “fully executed” as used in section (d)(2.5.2) shall mean the monitor has run and the following criteria are satisfied on a single driving cycle:

(i) Cumulative time since engine start is greater than or equal to 600 seconds;

(ii) Cumulative vehicle operation at or above 25 miles per hour occurs for greater than or equal to 300 seconds (medium-duty vehicles with diesel engines certified on an engine dynamometer may use cumulative operation at or above 15% calculated load in lieu of at or above 25 miles per hour for purposes of this criteria); and

(iii) Continuous vehicle operation at idle (i.e., accelerator pedal released by driver and vehicle speed less than or equal to one mile per hour) for greater than or equal to 30 seconds.

In determining whether continuous monitors have “fully executed,” monitors required to use “similar conditions” as defined in section (c) to store and erase pending and confirmed fault codes may not require that the similar conditions to be met prior to erasure of the permanent fault code.

(C) For 2009 and 2010 model year vehicles meeting the permanent fault code requirements of section (d)(2.2.5), manufacturers may request Executive Officer approval to use an alternate definition of “fully executed” as used in section (d)(2.5.2) for monitors subject to section (d)(2.5.2)(B). The Executive Officer shall approve alternate definitions of “fully executed” that:

(i) Will not likely result in a driving cycle that is longer and more difficult to meet than a driving cycle that meets conditions similar to those required under section (d)(2.5.2)(B), and

- (ii) Do not require access to enhanced scan tools (i.e., tools that are not generic SAE J1978 scan tools) to determine conditions necessary to meet the alternate definition of “fully executed.”
- (D) For the 2011 model year only, if an alternate definition of “fully executed” is approved by the Executive Officer under section (d)(2.5.2)(C) for use on 2009 or 2010 model year vehicles, a manufacturer may continue to use the approved alternate definition for 2011 model year vehicles previously certified in the 2009 or 2010 model year to the alternate definition and carried over to the 2011 model year.

Commentary: Section 1968.2(d)(2.5) was modified because of manufacturer confusion about when a permanent fault code can be erased, specifically after a code clear event and for monitors that are required to run continuously (e.g., fuel system monitors, misfire monitors, circuit monitors). For monitors that are designed to run continuously, including monitors that must wait until similar conditions are satisfied (e.g., misfire and fuel system monitors), to erase pending or confirmed codes, there has been uncertainty about when a permanent fault code should be cleared since a continuously running monitor makes multiple pass/fail decisions throughout the driving cycle. Further, for monitors requiring similar conditions to be satisfied prior to extinguishing a MIL, there has been uncertainty since there is no requirement to store similar conditions in NVRAM along with the permanent fault code and thus, no way to know if similar conditions have been satisfied or not. To ensure consistent implementation by all manufacturers and consistent methods for repair technicians to prepare vehicles for re-inspection by clearing permanent fault codes, the regulation has been modified to require that the permanent fault code should be erased only after the vehicle has been operated on a driving cycle in which both the monitor has run and passed without any indication of a malfunction and the criteria similar to those for a general denominator (section (d)(4.3.2)(B)) have been satisfied (with the exception that the general denominator conditions require ambient temperatures above 20 degrees Fahrenheit or below 8000 feet in elevation). This would ensure that the vehicle has been operated for a sufficient period of time to reasonably detect a recurrence of the malfunction but does not unnecessarily delay erasure of permanent fault codes. By eliminating the dependency on ambient temperature and altitude, the driving conditions can easily be met throughout California and the nation, regardless of location or seasonal temperatures. Further, in the special case of erasing a permanent fault code for a monitor that uses similar conditions following a code clear event, this eliminates the need for manufacturers to store similar conditions in NVRAM and actually prohibits manufacturers from using similar conditions to erase the permanent fault code. While this creates the possibility that a permanent fault code may be erased before the vehicle encounters similar conditions to those in which the malfunction was originally detected, this is not an issue since generic scan tools are not capable of reading similar conditions information, and repair technicians would be unable to determine how to operate the vehicle to erase a

permanent fault code - a situation that would be unacceptable for Inspection and Maintenance programs.

* * * *

(3) Monitoring Conditions.

* * * *

(3.2.1) Manufacturers shall define monitoring conditions that, in addition to meeting the criteria in section (d)(3.1), ensure that the monitor yields an in-use performance ratio (as defined in section (d)(4)) that meets or exceeds the minimum acceptable in-use monitor performance ratio on in-use vehicles. For purposes of this regulation, except as provided below in section (d)(3.2.1)(D), the minimum acceptable in-use monitor performance ratio is:

* * * *

(D) For introductory years:

- (i) through the 2007 model year, for the first ~~two~~ three years a vehicle is certified to the in-use performance ratio monitoring requirements of section (d)(3.2), 0.100 for all monitors specified in section (d)(3.2.1)(A) through (C) above. For example, the 0.100 ratio shall apply to the 2004, 2005, and 2006~~5~~ model years for vehicles first certified in the 2004 model year and to the 2007, 2008, and 2009~~8~~ model years for vehicles first certified in the 2007 model year.
- (ii) through the 2014 model year, for fuel system air-fuel ratio cylinder imbalance monitors, 0.100;
- (iii) through the 2011 model year, for secondary exhaust gas sensor monitors specified in (e)(7.2.2)(C), 0.100;
- (iv) through the 2012 model year, for vehicles subject to the monitoring requirements of section (f), 0.100 for all monitors specified in section (d)(3.2.1)(C) above.

Commentary: Section 1968.2(d)(3.2.1)(D) was modified to allow manufacturers to apply the 0.100 in-use ratio through the 2011 model year to the newly modified secondary exhaust gas sensor monitor described in section 1968.2(e)(7.2.2)(C) for the first years of implementation, since manufacturers expressed concern that they have not, to date, had experience with these monitors.

* * * *

(4) In-Use Monitor Performance Ratio Definition.

* * * *

(4.3) Denominator Specifications

* * * *

(4.3.2) Specifications for incrementing:

* * * *

(F) In addition to the requirements of section (d)(4.3.2)(B) above, the

denominator(s) for the following monitors of output components (except those operated only at engine start-up and subject to the requirements of the previous section (d)(4.3.2)(E)) shall be incremented if and only if the component is commanded to function (e.g., commanded “on”, “open”, “closed”, “locked”, etc.) on two or more occasions for greater than two seconds during the driving cycle or for a cumulative time greater than or equal to ten seconds, whichever occurs first:

Commentary: Based on manufacturer input, staff is proposing to modify section 1968.2(d)(4.3.2)(F) to clarify the specific conditions under which incrementing of the denominator is required.

* * * *

(6) Malfunction Criteria Determination for Diesel Vehicles.

* * * *

(6.2.4) For NMHC catalyst monitoring (section (f)(1)) on 2008 and subsequent model year vehicles, a manufacturer shall establish the adjustment factor for the NMHC catalyst monitor with the NMHC catalyst deteriorated to the malfunction threshold as required in section (d)(6.2). In lieu of establishing this adjustment factor for 2008 and 2009 model year vehicles, a manufacturer may provide emission data demonstrating that the worst case emission levels from a deteriorated NMHC catalyst are below the malfunction threshold specified in section (f)(1.2.2). The demonstration shall include emission testing with a NMHC catalyst deteriorated to the malfunction threshold or worse and with both the infrequent regeneration event occurring and without it occurring. The manufacturer shall calculate the worst case emission level by applying the frequency factor (“F” as calculated according to CFR, title 40, part 86.004-28(i)) of the infrequent regeneration event used for tailpipe certification to the measured emissions with the infrequent regeneration event occurring and adding that result to the measured emissions without the infrequent regeneration event occurring. This calculated final sum shall be used as the adjusted emission level and compared to the malfunction threshold for purposes of determining compliance with the monitoring requirements. The manufacturer shall submit a test plan for Executive Officer approval describing the emission testing procedure and how the worst case components will be established. The Executive Officer shall approve it upon finding the test procedure and components used will likely generate a worst case emission level.

Commentary: Section 1968.2(d)(6.2.4) has been modified to allow diesel manufacturers to be exempt from establishing a unique adjustment factor for the NMHC converting catalyst in the 2008 and 2009 model years if a failure of the catalyst does not cause emissions to exceed the malfunction thresholds specified in the monitoring requirements. This modification was made in response to

manufacturers' concerns about the workload involved in establishing the unique adjustment factors.

* * * *

(6.3) For every 2007 through 2012 model year light-duty vehicle test group certified to the higher allowable emission thresholds specified in section (f) (e.g., 5.0 or 3.0 times the applicable standards for NMHC converting catalyst monitoring) for vehicles prior to the 2013 model year:

(6.3.1) ~~The~~ manufacturer shall conduct in-use enforcement testing for compliance with the tailpipe emission standards in accordance with title 13, CCR sections 2136 through 2140. Within six months after OBD II certification of a test group, the manufacturer shall submit a plan for conducting the testing to the Executive Officer for approval. The Executive Officer shall approve the plan upon determining that the testing will be done in accordance with the procedures used by ARB when conducting such testing, that the plan will allow for a valid sample of at least 10 vehicles in the mileage range of 30,000 to 40,000 miles for comparison to the FTP intermediate (e.g., 50,000 mile) useful life standard and at least 10 vehicles in the mileage range of 90,000 to 100,000 miles for comparison to the FTP full useful life standard, and that copies of all records and data collected during the program will be provided to ARB. Manufacturers may also submit testing plans and supporting data for Executive Officer approval that differ from compliance testing under title 13, CCR, sections 2136 through 2140. The Executive Officer shall approve the plans upon determining that the plan provides equivalent assurance in verifying vehicles are meeting the tailpipe emission standards within the useful life. The Executive Officer may use the submitted data in lieu of or in addition to data collected pursuant to title 13, CCR section 2139 for purposes of the notification and use of test results described in title 13, CCR section 2140; and

(6.3.2) The certification shall be conditioned upon the manufacturer agreeing that, for any test group(s) determined to be noncompliant in accordance with title 13, CCR section 2140 or title 13, CCR section 1968.5, the Executive Officer shall determine the excess emissions caused by the noncompliance and the manufacturer shall fund a program(s) that will offset any such excess emissions.

Commentary: In response to manufacturer workload concerns, staff has proposed to modify section 1968.2(d)(6.3) to allow manufacturers to use alternate plans for verifying that emissions meet the standards for 2007 through 2012 light-duty diesel vehicles certified to the higher malfunction emission thresholds.

* * * *

(e) MONITORING REQUIREMENTS FOR GASOLINE/SPARK-IGNITED ENGINES

* * * *

(3) MISFIRE MONITORING

* * * *

(3.3) Monitoring Conditions:

(3.3.1) Manufacturers shall continuously monitor for misfire under the following conditions:

- (A) From no later than the end of the second crankshaft revolution after engine start,
- (B) While under positive torque conditions ~~During~~ the rise time and settling time for engine speed to reach the desired idle engine speed at engine start-up (i.e., “flare-up” and “flare-down”), and
- (C) Under all positive torque engine speeds and load conditions except within the following range: the engine operating region bound by the positive torque line (i.e., engine load with the transmission in neutral), and the two following engine operating points: an engine speed of 3000 rpm with the engine load at the positive torque line, and the redline engine speed (defined in section (c)) with the engine's manifold vacuum at four inches of mercury lower than that at the positive torque line.

Commentary: In response to manufacturers' concerns, staff has proposed to modify section 1968.2(e)(3.3.1)(B) to limit the monitoring of misfire during flare downs to just those occurring during positive torque conditions. Manufacturers argued that, while there were no outside influences acting on the engine during the flare-down, the engine may be in negative torque and misfire monitoring accuracy could be affected.

* * * *

(6) FUEL SYSTEM MONITORING

* * * *

(6.2) Malfunction Criteria:

(6.2.1) The OBD II system shall detect a malfunction of the fuel delivery system ~~(including feedback control based on a secondary oxygen sensor)~~ when:

- (A) ~~The fuel delivery system is unable to maintain a vehicle's emissions at or below 1.5 times any of the applicable FTP standards; or~~
- (B) If equipped, the feedback control based on a secondary oxygen or exhaust gas sensor is unable to maintain a vehicle's emissions (except as a result of a malfunction specified in section (e)(6.2.1)(C)) at or below 1.5 times any of the applicable FTP standards; or
- (C) Except as required in section (e)(6.2.6), for 25 percent of all 2011 model year vehicles, 50 percent of all 2012 model year vehicles, 75 percent of all 2013 model year vehicles, and 100 percent of all 2014 model year vehicles, an air-fuel ratio cylinder imbalance (e.g., the air-fuel ratio in one or more cylinders is different than the other cylinders due to a cylinder specific malfunction such as an intake manifold leak at a particular

cylinder, fuel injector problem, an individual cylinder EGR runner flow delivery problem, an individual variable cam lift malfunction such that an individual cylinder is operating on the wrong cam lift profile, or other similar problems) occurs in one or more cylinders such that the fuel delivery system is unable to maintain a vehicle's emissions at or below: 4.0 times the applicable FTP standards for PC/LDT SULEV II vehicles and 3.0 times the applicable FTP standards for all other vehicles for the 2011 through 2013 model years ~~vehicles~~; and 1.5 times the applicable FTP standards for all 2014 and subsequent model year vehicles. In lieu of using 1.5 times the applicable FTP standards for all 2014 model year applications, for the 2014 model year only, a manufacturer may continue to use 4.0 times the applicable FTP standards for PC/LDT SULEV II vehicles and 3.0 times the applicable FTP standards for ~~any other~~ applications previously certified in the 2011, 2012, or 2013 model year to 4.0 times or 3.0 times the applicable FTP standards and carried over to the 2014 model year.

Commentary: This modification to section 1968.2(e)(6.2.1)(C) provides a higher threshold for PC/LDT SULEV II vehicles (4.0 times instead of 3.0 times the applicable FTP standards) during the 2011 through 2013 model years and for carry-over vehicles in the 2014 model year because PC/LDT SULEV II vehicles have generally been provided with a higher threshold of 2.5 times, in lieu of 1.5 times, the applicable FTP standards, as allowed under section 1968.2(e)(17.1.1). The higher threshold recognizes the potential greater difficulty manufacturers have experienced in meeting the lower threshold.

* * * *

- (6.4) MIL Illumination and Fault Code Storage: For malfunctions described under section (6.2.1)(C) (i.e., air-fuel ratio cylinder imbalance malfunctions), general requirements for MIL illumination and fault code storage are set forth in section (d)(2). For all other fuel system malfunctions, the MIL illumination and fault code storage requirements are set forth in sections (e)(6.4.1) through (6.4.6) below.

Commentary: Staff has added the modifications to section 1968.2(e)(6.4) to address the proposed new requirement for air-fuel cylinder imbalance monitoring, which is not required to be continuously enabled.

* * * *

(7) OXYGEN EXHAUST GAS SENSOR MONITORING

* * * *

- (7.2) Malfunction Criteria:
(7.2.1) Primary Sensors:

(A) The OBD II system shall detect a malfunction prior to any failure or deterioration of the oxygen sensor voltage, response rate, amplitude, or other characteristic(s) (including drift or bias corrected for by secondary sensors) that would cause a vehicle's emissions to exceed 1.5 times any of the applicable FTP standards. For response rate (see section (c)), the OBD II system shall detect asymmetric malfunctions (i.e., malfunctions that primarily affect only the lean-to-rich response rate or only the rich-to-lean response rate) and symmetric malfunctions (i.e., malfunctions that affect both the lean-to-rich and rich-to-lean response rates). As defined in section (c), response rate includes delays in the sensor to initially react to a change in exhaust gas composition as well as delays during the transition from a rich-to-lean (or lean-to-rich) sensor output. For 25 percent of 2009-10, 50 percent of 2010-11, and 100 percent of 2011-12 and subsequent model year vehicles, the manufacturer shall submit data and/or engineering analysis to demonstrate that the calibration method used ensures proper detection of all symmetric and asymmetric response rate malfunctions as part of the certification application.

Commentary: Based on manufacturer input, the phase-in regarding the primary exhaust gas sensor monitoring requirements in section 1968.2(e)(7.2.1)(A) has been modified to delay the phase-in schedule by one year to allow manufacturers additional lead time to meet this requirement.

* * * *

(7.2.2) Secondary Sensors:

* * * *

(C) Sufficient sensor performance for other monitors.

- (i) To the extent feasible, the OBD II system shall detect a malfunction of the oxygen sensor when the sensor output voltage, amplitude, activity, or other characteristics are no longer sufficient for use as an OBD II system monitoring device (e.g., for catalyst monitoring). For this requirement, "sufficient" is defined as the capability of the worst performing acceptable sensor to detect the best performing unacceptable other monitored system or component (e.g., catalyst).
- (ii) For systems where it is not technically feasible to satisfy the criteria of section (e)(7.2.2)(C)(i) completely, the OBD II system shall, at a minimum, detect a slow rich-to-lean response malfunction during a fuel shut-off event (e.g., deceleration fuel cut event). The rich-to-lean response check shall monitor both the sensor response time from a rich condition (e.g., 0.7 Volts) prior to the start of fuel shut-off to a lean condition (e.g., 0.1 Volts) expected during fuel shut-off conditions and the sensor transition time in the intermediate sensor range (e.g., from 0.55 Volts to 0.3 Volts). Monitoring of the rich-to-lean response shall be phased in on at least 25 percent of the 2009, 50 percent of the 2010, and 100 percent of the 2011 model year vehicles. For purposes of this phase-in, vehicles meeting the criteria of section

(e)(7.2.2)(C)(i) shall be counted as vehicles meeting the rich-to-lean response rate monitoring requirement of section (e)(7.2.2)(C)(ii).

Commentary: The phase-in regarding the secondary exhaust gas sensor monitoring requirements in section 1968.2(e)(7.2.2)(C)(ii) has been modified as requested by manufacturers to provide additional flexibility to meet this requirement. Specifically, the lower numbers in the first two years would allow a wider range of alternate phase-in schedules including those that do not start until the second year of the required phase-in.

* * * *

(7.3) Monitoring Conditions:

* * * *

(7.3.2) Secondary Sensors

(A) Manufacturers shall define monitoring conditions for malfunctions identified in sections (e)(7.2.2)(A), ~~(B)~~, and (C) (e.g., proper sensor activity) in accordance with sections (d)(3.1) and (d)(3.2) (i.e., minimum ratio requirements). For all 2010 and subsequent model year vehicles meeting the monitoring requirements of section (e)(7.2.2)(C)(i) or (ii), for purposes of tracking and reporting as required in section (d)(3.2.2), all monitors used to detect malfunctions identified in sections (e)(7.2.2)(A) and (C) shall be tracked separately but reported as a single set of values as specified in section (d)(5.2.2).

Commentary: The phase-in regarding the secondary exhaust gas sensor tracking and reporting requirements in section 1968.2(e)(7.3.2)(A) has been modified to be consistent with the phase-in for rich-to-lean response rate monitoring detailed in section 1968.2(e)(7.2.2)(C)(ii).

* * * *

(11) COLD START EMISSION REDUCTION STRATEGY MONITORING

* * * *

(11.2.2) For 25 percent of 2010, 50 percent of 2011, and 100 percent of 2012 and subsequent model year vehicles, the OBD II system shall, to the extent feasible, detect a malfunction if either of the following occurs:

Commentary: Section 1968.2(e)(11.2.2) has been modified to address manufacturers' concerns about conducting robust functional monitoring on components used for cold start strategies in cases where the component plays a very minor role and malfunctioning operation cannot be distinguished from proper operation.

* * * *

(17) EXCEPTIONS TO MONITORING REQUIREMENTS

* * * *

(17.3) Manufacturers may request Executive Officer approval to disable an OBD II system monitor at ambient ~~engine-starting~~ temperatures below twenty degrees Fahrenheit (20°F) (low ambient temperature conditions may be determined based on intake air or engine coolant temperature ~~at engine starting~~) or at elevations above 8000 feet above sea level. The Executive Officer shall approve the request upon determining that the manufacturer has provided data and/or an engineering evaluation that demonstrate that monitoring during the conditions would be unreliable. A manufacturer may further request, and the Executive Officer shall approve, that an OBD II system monitor be disabled at other ambient ~~engine-starting~~ temperatures upon determining that the manufacturer has demonstrated with data and/or an engineering evaluation that misdiagnosis would occur at the ambient temperatures because of its effect on the component itself (e.g., component freezing).

Commentary: Section 1968.2(e)(17.3) has been modified to correct an oversight in not deleting the phrase “at engine starting” within the parenthetical to be consistent with the deletion in the 45-day notice of this unnecessary clause earlier in the sentence.

* * * *

(17.8) Whenever the requirements in section (e) of this regulation require monitoring “to the extent feasible”, the manufacturer shall submit its proposed monitor(s) for Executive Officer approval. The Executive Officer shall approve the proposal upon determining that the proposed monitor(s) meets the criteria of “to the extent feasible” by considering the best available monitoring technology to the extent that it is known or should have been known to the manufacturer and given the limitations of the manufacturer’s existing hardware, the extent and degree to which the monitoring requirements are met in full, the limitations of monitoring necessary to prevent significant errors of commission and omission, and the extent to which the manufacturer has considered and pursued alternative monitoring concepts to meet the requirements in full. The manufacturer’s consideration and pursuit of alternative monitoring concepts shall include evaluation of other modifications to the proposed monitor(s), the monitored components themselves, and other monitors that use the monitored components (e.g., altering other monitors to lessen the sensitivity and reliance on the component or characteristic of the component subject to the proposed monitor(s)).

Commentary: The language in section 1968.2(e)(17.8) was modified to address manufacturers’ concerns about having to meet the requirement regarding “best available monitoring technology,” in that manufacturers may not have specific knowledge of the best available monitoring technology.

* * * *

(f) MONITORING REQUIREMENTS FOR DIESEL/COMPRESSION-IGNITION ENGINES

* * * *

(6) EXHAUST GAS RECIRCULATION (EGR) SYSTEM MONITORING

* * * *

(6.2) Malfunction Criteria:

(6.2.1) Low Flow:

(A) The OBD II system shall detect a malfunction of the EGR system at or prior to a decrease from the manufacturer's specified EGR flow rate that would cause a vehicle's NMHC, CO, NOx, or PM emissions to exceed:

* * * *

- (ii) For medium-duty vehicles (including MDPVs) certified to an engine dynamometer tailpipe emission standard:
 - a. 1.5 times the applicable FTP standards for 2004 through 2006 model year vehicles;
 - b. 1.5 times the applicable NMHC, CO, and NOx standards or 0.03 g/bhp-hr PM as measured from an applicable cycle emission test for 2007 and subsequent model year vehicles certified to an engine dynamometer tailpipe NOx emission standard of greater than 0.50 g/bhp-hr NOx;
 - c. 2.5 times the applicable NMHC or CO standards, the applicable NOx standard by more than 0.3 g/bhp-hr (e.g., cause NOx emissions to exceed 0.5 g/bhp-hr if the emission standard is 0.2 g/bhp-hr) as measured from an applicable cycle emission test, or 0.03 g/bhp-hr PM as measured from an applicable cycle emission test for 2007 through 2012 model year vehicles certified to an engine dynamometer tailpipe NOx emission standard of less than or equal to 0.50 g/bhp-hr NOx; and
 - d. 2.0 times the applicable NMHC or CO standards, the applicable NOx standard by more than 0.2 g/bhp-hr (e.g., cause NOx emissions to exceed 0.4 g/bhp-hr if the emission standard is 0.2 g/bhp-hr) as measured from an applicable cycle emission test, or 0.03 g/bhp-hr PM as measured from an applicable cycle emission test for 2013 and subsequent model year vehicles certified to an engine dynamometer tailpipe NOx emission standard of less than or equal to 0.50 g/bhp-hr NOx.

Commentary: The malfunction thresholds for EGR system monitoring in section 1968.2(f)(6.2.1)(A)(ii) have been corrected to distinguish the thresholds between medium-duty vehicles certified to a NOx standard of greater than 0.50 g/bhp-hr and those certified to a NOx standard of less than or equal to 0.50 g/bhp-hr, since the original proposed thresholds mistakenly required vehicles certified to a

NOx standard of greater than 0.50 g/bhp-hr to monitor to a NOx threshold more stringent than 1.5 times the standards.

* * * *

(9) PARTICULATE MATTER (PM) FILTER MONITORING

* * * *

(9.2) Malfunction Criteria:

* * * *

(9.2.2) Frequent Regeneration:

~~(A) For 2007 through 2009 model year vehicles, the OBD II system shall detect a malfunction when the PM filter regeneration frequency exceeds the manufacturer's specified design limits for allowable regeneration frequency.~~

~~(B)~~ (A) For 2010 and subsequent model year vehicles, the OBD II system shall detect a malfunction when PM filter regeneration occurs more frequently than (i.e., occurs more often than) the manufacturer's specified regeneration frequency such that it would cause a vehicle's emissions to exceed:

* * * *

~~(C)~~ (B) If no failure or deterioration causes an increase in the PM filter regeneration frequency that could result in a vehicle's NMHC, CO, or NOx emissions exceeding the applicable malfunction criteria specified in section (f)(9.2.2)(~~BA~~), the OBD II system shall detect a malfunction when the PM filter regeneration frequency exceeds the manufacturer's specified design limits for allowable regeneration frequency.

* * * *

(9.2.3) Incomplete regeneration: For 2010 and subsequent model year vehicles, the OBD II system shall detect a regeneration malfunction when the PM filter does not properly regenerate under manufacturer-defined conditions where regeneration is designed to occur.

(9.2.4) NMHC conversion: For 2010 and subsequent model year vehicles with catalyzed PM filters that convert NMHC emissions, the OBD II system shall monitor the catalyst function of the PM filter and detect a malfunction when the NMHC conversion capability decreases to the point that NMHC emissions exceed the applicable emission levels specified in sections (f)(9.2.2)(~~BA~~). If no failure or deterioration of the NMHC conversion capability could result in a vehicle's NMHC emissions exceeding these emission levels, the OBD II system shall detect a malfunction when the system has no detectable amount of NMHC conversion capability.

* * * *

Commentary: The PM filter monitoring requirements in section 1968.2(f)(9.2.2) and (f)(9.2.3) have been modified to allow for more lead time to meet the requirements, based on concerns from manufacturers. Manufacturers would

now be required to monitor for frequent regeneration and incomplete regeneration faults starting with the 2010 model year, rather than 2007. Additional changes were made to section (f)(9.2.4) to clarify that NMHC conversion monitoring would also start with the 2010 model year and to sections 1968.2(f)(9.2.2)(C) (now (f)(9.2.2)(B)) and (f)(9.2.4) to modify the reference of “section (f)(9.2.2)(B)” to “section (f)(9.2.2)(A).”

* * * *

(12) COLD START EMISSION REDUCTION STRATEGY MONITORING

* * * *

(12.2) Malfunction Criteria: The OBD II system shall, to the extent feasible, detect a malfunction if either of the following occurs:

Commentary: Section 1968.2(f)(12.2) has been modified to address manufacturers’ concerns about conducting robust functional monitoring on components used for cold start strategies in cases where the component plays a very minor role and malfunctioning operation cannot be distinguished from proper operation.

* * * *

(13) VARIABLE VALVE TIMING AND/OR CONTROL (VVT) SYSTEM MONITORING

* * * *

(13.2) Malfunction Criteria:

(13.2.1) Target Error: The OBD II system shall detect a malfunction prior to any failure or deterioration in the capability of the VVT system to achieve the commanded valve timing and/or control within a crank angle or lift tolerance that would cause a vehicle's NMHC, CO, NOx, or PM emissions to exceed:

* * * *

(B) For medium-duty vehicles (including MDPVs) certified to an engine dynamometer tailpipe emission standard:

- (i) 1.5 times the applicable NMHC, CO, or NOx standards or 0.03 g/bhp-hr PM as measured from an applicable cycle emission test for 2006 and subsequent model year vehicles certified to an engine dynamometer tailpipe NOx emission standard of greater than 0.50 g/bhp-hr NOx;
- (ii) 2.5 times the applicable NMHC or CO standards, the applicable NOx standard by more than 0.3 g/bhp-hr (e.g., cause NOx emissions to exceed 0.5 g/bhp-hr if the emission standard is 0.2 g/bhp-hr) as measured from an applicable cycle emission test, or 0.03 g/bhp-hr PM as measured from an applicable cycle emission test for 2006 through 2012 model year vehicles certified to an engine dynamometer tailpipe NOx emission standard of less than or equal to 0.50 g/bhp-hr NOx;
and

(iii) 2.0 times the applicable NMHC or CO standards, the applicable NOx standard by more than 0.2 g/bhp-hr (e.g., cause NOx emissions to exceed 0.4 g/bhp-hr if the emission standard is 0.2 g/bhp-hr) as measured from an applicable cycle emission test, or 0.03 g/bhp-hr PM as measured from an applicable cycle emission test for 2013 and subsequent model year vehicles certified to an engine dynamometer tailpipe NOx emission standard of less than or equal to 0.50 g/bhp-hr NOx.

Commentary: The malfunction thresholds for VVT system monitoring in section 1968.2(f)(13.2.1)(B) have been corrected based on the same reasoning given above for diesel EGR system monitoring (section 1968.2(f)(6)).

* * * *

(17) EXCEPTIONS TO MONITORING REQUIREMENTS

* * * *

(17.1.5) For medium-duty diesel vehicles (except MDPVs) certified to a chassis dynamometer tailpipe emission standard, the monitoring requirements and malfunction criteria in section (f) applicable to medium-duty diesel vehicles certified to an engine dynamometer tailpipe emission standard shall apply. However, the manufacturer shall request Executive Officer approval of a manufacturer-proposed medium-duty chassis dynamometer-based malfunction criterion that is equivalent to that criteria in lieu of the engine dynamometer-based malfunction criteria required for each monitor in section (f). The Executive Officer shall approve the request upon finding that:

- (A) the manufacturer has used good engineering judgment in determining the equivalent malfunction criteria, and
- (B) that the criterion malfunction criteria will provide for similar timeliness in detection of malfunctioning components with respect to detection of malfunctions on medium-duty diesel vehicles certified to an engine dynamometer tailpipe emission standard.
- (C) the malfunction criteria are set as stringently as technologically feasible with respect to indicating a malfunction at the lowest possible tailpipe emission levels (but not lower than 1.5 times the chassis dynamometer tailpipe emission standard the vehicle is certified to), considering the best available monitoring technology to the extent that it is known or should have been known to the manufacturer.
- (D) the malfunction criteria will prevent detection of a malfunction when the monitored component is within the performance specifications for components aged to the end of the full useful life, and
- (E) the manufacturer has provided emission data showing the emission levels at which the malfunctions are detected.

Commentary: The modifications in section 1968.2(f)(17.1.5) were made in response to manufacturers requesting that the criteria for determining acceptable chassis-based malfunctions be further clarified and that a bound no more stringent than 1.5 times the chassis dynamometer tailpipe emission standard be established.

* * * *

(17.3) Manufacturers may request Executive Officer approval to disable an OBD II system monitor at ambient temperatures below twenty degrees Fahrenheit (20°F) (low ambient temperature conditions may be determined based on intake air or engine coolant temperature ~~at engine starting~~) or at elevations above 8000 feet above sea level. The Executive Officer shall approve the request upon determining that the manufacturer has provided data and/or an engineering evaluation that demonstrate that monitoring during the conditions would be unreliable. A manufacturer may further request, and the Executive Officer shall approve, that an OBD II system monitor be disabled at other ambient temperatures upon determining that the manufacturer has demonstrated with data and/or an engineering evaluation that misdiagnosis would occur at the ambient temperatures because of its effect on the component itself (e.g., component freezing).

Commentary: Section 1968.2(f)(17.3) has been modified to correct an oversight in not deleting the phrase “at engine starting” within the parenthetical when determining the ambient temperature using either the intake air or engine coolant temperature, since this language is intended to be the same as that for gasoline monitoring under section 1968.2(e)(17.3).

* * * *

(17.7) Whenever the requirements in section (f) of this regulation require monitoring “to the extent feasible”, the manufacturer shall submit its proposed monitor(s) for Executive Officer approval. The Executive Officer shall approve the proposal upon determining that the proposed monitor(s) meets the criteria of “to the extent feasible” by considering the best available monitoring technology to the extent that it is known or should have been known to the manufacturer and given the limitations of the manufacturer’s existing hardware, the extent and degree to which the monitoring requirements are met in full, the limitations of the monitoring necessary to prevent significant errors of commission and omission, and the extent to which the manufacturer has considered and pursued alternative monitoring concepts to meet the requirements in full. The manufacturer’s consideration and pursuit of alternative monitoring concepts shall include evaluation of other modifications to the proposed monitor(s), the monitored components themselves, and other monitors that use the monitored components (e.g., altering other monitors to

lessen the sensitivity and reliance on the component or characteristic of the component subject to the proposed monitor(s).

Commentary: The language in section 1968.2(f)(17.7) was modified to address manufacturers' concerns about having to meet the requirement regarding "best available monitoring technology," in that manufacturers may not have specific knowledge of the best available monitoring technology.

* * * *

(g) STANDARDIZATION REQUIREMENTS

(1) Reference Documents:

The following Society of Automotive Engineers (SAE) and International Organization of Standards for Standardization (ISO) documents are incorporated by reference into this regulation. Upon request by a manufacturer, the Executive Officer may approve use of a subsequently revised finalized version of any of the SAE and ISO documents listed below if use of the revised document does not adversely affect the purposes, intent, and effectiveness of this regulation.

* * * *

- (1.4) Draft SAE J1979 "E/E Diagnostic Test Modes—Equivalent to ISO/DIS 15031-5: April 30, 2002", April 2002 ~~April 2002~~ April 2007 (SAE J1979).

* * * *

- (1.10) SAE J1939 ~~APR00~~ March 2005 -"Recommended Practice for a Serial Control and Communications Vehicle Network" and the associated subparts included in SAE HS-1939, "Truck and Bus Control and Communications Network Standards Manual", 2004~~5~~ Edition (SAE J1939).

(1.10.1) SAE J1939-73 "Application Layers - Diagnostics", September 2006.

* * * *

- (1.12) SAE J2534-1 – "Recommended Practice for Pass-Thru Vehicle Programming", April ~~April~~ December 2004 (SAE J2534-1).

Commentary: The language in section 1968.2(g)(1) was modified to allow manufacturers, with Executive Officer approval, to use subsequently revised versions of the SAE and ISO documents listed. This would address concerns about manufacturers using more recently updated versions of the documents before ARB has officially adopted changes to the OBD II regulation to update a specific document reference. The change would provide manufacturers, on a case-by-case basis, with greater compliance flexibility. Further, staff is proposing to modify the regulation to incorporate by reference in section 1968.2(g)(1) the latest version of SAE J1939-73. Additionally, the reference SAE J2534 in section 1968.2(g)(1.12) was modified to correct the title from "J2534" to "J2534-1" and the publication date from April to December 2004.

Finally, staff is proposing to modify the reference document SAE J1979 to the latest draft version, now referred to as "E/E Diagnostic Test Modes," dated April 2007. This reference is meant to be temporary, as the finalized version of SAE

J1979, dated May 2007, has not been officially approved and published at the time this 15-day notice was published, but will be in the very near future. This finalized May 2007 version will be referenced in the OBD II regulation in the Final Statement of Reasons.

* * * *

(4) Required Emission Related Functions:

The following standardized functions shall be implemented in accordance with the specifications in SAE J1979 to allow for access to the required information by a scan tool meeting SAE J1978 specifications:

- (4.1) Readiness Status: In accordance with SAE J1979 specifications, the OBD II system shall indicate “complete” or “not complete” since the fault memory was last cleared for each of the installed monitored components and systems identified in sections (e)(1) through (e)(8), ~~(e)(13), (e)(15),~~ (f)(1) through (f)(4), (f)(6), (f)(8), and (f)(15). ~~and, additionally for All 2010 and subsequent model year diesel vehicles,~~ shall additionally indicate the appropriate readiness status for monitors identified in sections (f)(5), (f)(7), and (f)(9), and (f)(13) since the fault memory was last cleared. All 2010 and subsequent model year vehicles equipped with VVT system monitoring and subject to the test results requirements specified in section (g)(4.5.4)(C) shall additionally indicate the appropriate readiness status for VVT system monitors identified in sections (e)(13) and (f)(13). All components or systems that are monitored continuously shall always indicate “complete”. Those components or systems that are not subject to continuous monitoring shall immediately indicate “complete” upon the respective diagnostic(s) being fully executed and determining that the component or system is not malfunctioning. A component or system shall also indicate “complete” if after the requisite number of decisions necessary for determining MIL status have been fully executed, the monitor indicates a malfunction for the component or system. The status for each of the monitored components or systems shall indicate “not complete” whenever fault memory has been cleared or erased by a means other than that allowed in section (d)(2). Normal vehicle shut down (i.e., key off, engine off) may not cause the status to indicate “not complete”.

Commentary: An increasing trend towards the use of VVT systems on newer vehicles led to the need to add the VVT system monitor to the list of monitors covered by readiness status in section 1968.2(g)(4.1). A phase-in was added in section 1968.2(g)(4.1) for VVT system readiness status that aligns with the phase-in for the VVT system test results requirement in section 1968.2(g)(4.5.4)(C) based on manufacturers’ input to provide leadtime to incorporate this change. Additionally, the paragraph was edited to provide greater clarity.

* * * *

(4.3) Freeze Frame.

(4.3.1) "Freeze frame" information required to be stored pursuant to sections (d)(2.2.4~~67~~), (e)(3.4.3), and ~~(e)(6.4.4)~~, ~~(f)(3.4.2)(B)~~, and ~~(f)(4.4.2)(D)~~ shall be made available on demand through the standardized data link connector in accordance with SAE J1979 specifications.

Commentary: The reference to section (d)(2.2.6) in section 1968.2(g)(4.3.1) was incorrect and has been modified to reference section (d)(2.2.7) instead.

* * * *

(4.5) Test Results

* * * *

(4.5.4) Additionally, for vehicles using ISO 15765-4 (see section ~~(f)(g)~~(3.4)) as the communication protocol:

* * * *

(E) All test results and test limits shall always be reported and the test results shall be stored until updated by a more recent valid test result or the fault memory of the OBD II system computer is cleared. For monitors with multiple pass/fail criteria (e.g., a purge flow diagnostic that can pass upon seeing a rich shift, lean shift, or engine speed change), on 25 percent of 2009, 50 percent of 2010, and 100 percent of 2011 and subsequent model year vehicles, only the test results used in the most recent decision shall be reported with valid results and limits while test results not used in the most recent decision shall report values of zero for the test results and limits (e.g., a purge flow monitoring event that passed based on seeing a rich shift shall report the results and the limits of the rich shift test and shall report values of zero for the results and limits of the lean shift and engine speed change tests).

Commentary: In response to manufacturer expressed concerns that they did not have sufficient lead time to meet the above requirement, staff has proposed that the requirements of section 1968.2(g)(4.5.4)(E) be phased-in to allow manufacturers additional time.

* * * *

(4.7) Software Calibration Verification Number

(4.7.1) All 2005² and subsequent model year vehicles shall use an algorithm to calculate a calibration verification number (CVN) that verifies the on-board computer software integrity in diagnostic or emission critical electronically reprogrammable powertrain control units. The CVN shall be made available through the standardized data link connector in accordance with the SAE J1979 specifications. The CVN shall be capable of being used to determine if the emission-related software and/or calibration data are valid and applicable for that vehicle and CAL ID. For 50 percent of 2010 and

100 percent of 2011 and subsequent model year vehicles, one CVN shall be made available for each CAL ID made available and each CVN shall be output to a generic scan tool in the same order as the CAL IDs are output to the scan tool to allow the scan tool to match each CVN to the corresponding CAL ID.

Commentary: Based on manufacturers' concerns that additional lead time was needed to comply with the above requirements, staff has modified the section 1968.2(g)(4.7.1) to allow them to phase-in compliance over two years.

* * * *

(4.7.4) For purposes of Inspection and Maintenance (I/M) testing, manufacturers shall make the CVN and CAL ID combination information available for all ~~2005~~2008 and subsequent model year vehicles in a standardized electronic format that allows for off-board verification that the CVN is valid and appropriate for a specific vehicle and CAL ID. The standardized electronic format is detailed in Attachment ~~XXX-E~~: CAL ID and CVN Data of ARB Mail-Out #~~XX-XX~~, Month-Date, Year-#MSC 06-23, December 21, 2006, incorporated by reference. Manufacturers shall submit the CVN and CAL ID information to the Executive Officer not more than 25 days after the close of a calendar quarter, with the first set of information required to be submitted no later than October 25, 2007.

Commentary: In response to manufacturer concerns about being able to comply with the requirements of section 1968.2(g)(4.7.4), staff has proposed to modify the section to delay implementation of making the CVN and CAL ID information available in a standardized format from the 2005 model year to the 2008 model year. The section was also updated to reflect the appropriate ARB Mail-Out reference, which was just recently published. Finally, additional language was added to clarify the quarterly submission deadlines of the CVN and CAL ID information.

* * * *

(4.9) ECU Name: For all 2010 and subsequent model year vehicles, †The name of each electronic control unit that responds to an SAE J1978 scan tool with a unique address or identifier shall be communicated in a standardized format in accordance with SAE J1979 (i.e., ECUNAME in Service/Mode \$09, InfoType \$0A). Except as specified for vehicles with more than one engine control unit, communication of the ECU name in a standardized format is required on 50 percent of 2010, 75 percent of 2011, and 100 percent of 2012 and subsequent model year vehicles. For vehicles with more than one engine control unit (e.g., a 12 cylinder engine with two engine control units, each of which controls six cylinders), communication of the ECU name is required on all 2010 and subsequent model year vehicles.

Commentary: The language in section 1968.2(g)(4.9) was modified to allow for a later phase-in of this requirement for vehicles that have only one engine control unit, since the requirement is primarily aimed at vehicles with more than one engine control unit.

* * * *

(h) MONITORING SYSTEM DEMONSTRATION REQUIREMENTS FOR CERTIFICATION

* * * *

(5) Testing Protocol:

(5.1) Preconditioning: The manufacturer shall use an applicable FTP cycle (FTP, SET, or Unified Cycle, ~~if approved~~) for preconditioning test vehicles prior to conducting each of the above emission tests. Upon determining that a manufacturer has provided data and/or an engineering evaluation that demonstrate that additional preconditioning is necessary to stabilize the emission control system, the Executive Officer shall allow the manufacturer to perform a single additional preconditioning cycle, identical to the initial preconditioning cycle, or a Federal Highway Fuel Economy Driving Cycle, following a ten minute (20 minutes for medium duty engines certified on an engine dynamometer) hot soak after the initial preconditioning cycle. The manufacturer may not require the test vehicle to be cold soaked prior to conducting preconditioning cycles in order for the monitoring system testing to be successful.

* * * *

(5.2.3) The test vehicle shall then be operated over the ~~cold start and hot start exhaust tests of the applicable exhaust emission FTP test~~. If monitoring is designed to run during the Unified Cycle ~~is approved~~, a second Unified Cycle may be conducted prior to the FTP exhaust emission test.

Commentary: Modifications were made to sections 1968.2(h)(5.1) and (h)(5.2.3) to acknowledge that monitors are already allowed to be designed to run on the Unified Cycle without Executive Officer approval under section 1968.2(d). Accordingly, there is no need to seek Executive Officer approval to use an allowed cycle for demonstration purposes in this section.

* * * *

(i) CERTIFICATION DOCUMENTATION

* * * *

(2) The following information shall be submitted as “Part 1” of the certification application. Except as provided below for demonstration data, the Executive Officer will not issue an Executive Order certifying the covered vehicles without the information having been provided. The information must include:

* * * *

(2.5) For gasoline vehicles, Data supporting the misfire monitor, including:

* * * *

(2.5.3) Data identifying all disablement of misfire monitoring that occurs during the FTP and US06 cycles. For every disablement that occurs during the cycles, the data should identify: when the disablement occurred relative to the driver's trace, the number of engine revolutions that each disablement was present for, and which disable condition documented in the certification application caused the disablement. The data shall be submitted in the standardized format detailed in Attachment ~~XXX~~A: Misfire Disablement and Detection Chart of ARB Mail-Out #~~XX-XX~~, Month ~~Date~~, Year #MSC 06-23, December 21, 2006, incorporated by reference.

Commentary: Section 1968.2(i)(2.5.3) was updated to reflect the appropriate ARB Mail-Out reference, which was just recently published.

* * * *

(2.16) A checklist of all the malfunction criteria in sections (e) or (f) and the corresponding diagnostic noted by fault code for each malfunction criterion. The formats of the checklists are detailed in Attachments F and G of ARB Mail-Out #MSC 06-23, December 21, 2006, incorporated by reference.

(2.17) Any other information determined by the Executive Officer to be necessary to demonstrate compliance with the requirements of this regulation.

Commentary: Section 1968.2(i)(2.16) was added to reflect the additional information (i.e., OBD II checklist) required to be submitted by manufacturers with the certification application.

* * * *

(k) DEFICIENCIES

* * * *

(7) For 2007 through 2009 model year light-duty and 2007 through 2012 model year medium-duty diesel vehicles, in cases where one or more of the deficiencies is for the aftertreatment monitoring requirements of sections (f)(1), (2), (8), or (9) and the deficient monitor is properly able to detect all malfunctions prior to emissions exceeding twice the required monitor threshold (e.g., before emissions exceed 10 times the standard for NMHC if the threshold is 5.0 times the standard for NMHC), the specified fines shall apply to the fourth and subsequently identified deficiencies in lieu of the third and subsequently identified deficiencies. If none of the deficiencies are for the requirements of sections (f)(1), (2), (8), or (9) or if the deficient aftertreatment monitor exceeds twice the required monitor threshold, the specified fines shall apply to the third and subsequently identified deficiencies. In all cases, the exception that fines shall apply to all monitoring system deficiencies wherein a required monitoring strategy is completely absent from the OBD system still applies.

Commentary: Section 1968.2(k) was modified to allow 2007 through 2012 model year medium-duty diesel vehicles a third free deficiency if one of the deficiencies is for a specific aftertreatment monitor identified above. As proposed in the 45-day notice, this provision was only available for 2007 through 2009 model year light-duty diesel vehicles but was extended to 2007 through 2012 medium-duty diesel vehicles at industry's request to provide additional flexibility to medium-duty vehicle manufacturers as they implement new aftertreatment hardware to meet the 2007 and 2010 tailpipe certification standards.

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

* * * *

(b) *Testing Procedures*

* * * *

(6) Finding of Nonconformance after Enforcement Testing.

After conducting enforcement testing pursuant to section (b)(4) above, the Executive Officer shall make a finding of nonconformance of the OBD II system in the identified motor vehicle class if:

* * * *

(B) OBD II Ratio Testing.

- (i) For monitors on 2004 through ~~2008~~ 2014 model year vehicles certified to a ratio of 0.100 in accordance with title 13, CCR section 1968.2(d)(3.2.1)(D) and on 2007 through 2012 model year vehicles for the first three years the monitor is certified to the in-use performance ratio monitoring requirements of sections 1968.2(d)(3.2.1)(A) through (C), the data collected from the vehicles in the test sample indicate either that the average in-use monitor performance ratio for one or more of the monitors in the test sample group is less than 0.100 or that 66.0 percent or more of the vehicles in the test sample group have an in-use monitor performance ratio of less than 0.100 for the same monitor.
- (ii) For monitors on ~~2006~~ 2007 and subsequent model year vehicles that have been certified for more than three years to the ratios in title 13, CCR sections 1968.2(d)(3.2.1)(A) through (C), the data collected from the vehicles in the test sample indicate either that 66.0 percent or more of the vehicles in the test sample group have an in-use monitor performance ratio of less than the required minimum ratio defined in title 13, CCR section 1968.2(d)(3.2.1) for the same monitor or that the average in-use monitor performance ratio for one or more of the monitors in the motor vehicle class is less than the required minimum ratio defined in title 13, CCR section 1968.2(d)(3.2.1) as defined by determining the average in-use monitor performance ratio for one or more of the monitors in the test sample group is less than:

Commentary: Sections 1968.5(b)(6)(B)(i) and (ii) were modified to allow more enforcement relief for 2007 through 2012 model year vehicles with monitors certified for the first three years to the final in-use monitor performance ratios. Specifically, a finding of nonconformance for these vehicles would be tied to meeting an in-use monitor performance ratio of 0.100 in lieu of the final ratios.

* * * *