ATTACHMENT I

Proposed 15-Day Modifications to Sections 1968.2, 1971.1, and 1971.5, title 13, California Code of Regulations

Set forth below are proposed modifications to the amendments to California Code of Regulations, title 13, sections 1968.2 and 1971.1 and to California Code of Regulations, title 13, section 1971.5 that were presented to the Board for adoption on May 28, 2009. The original proposed amendments were made available to the public as part of the 45-Day Notice on April 10, 2009. The original proposed amendments to sections 1968.2 and 1971.1 are shown in single underline to indicate additions and ~~single strikeout~~ to indicate deletions made to the existing text that was adopted for section 1971.1 in 2005 and was last amended for section 1968.2 in 2006. The regulatory text for section 1971.5 that was proposed as part of the 45-Day Notice is indicated in plain type. The proposed modifications made available by the "15-day" notice are shown in double underline to indicate additions and ~~double strikeout~~ to indicate deletions.

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 -- 2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines

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(d) *GENERAL REQUIREMENTS.*

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(2) *MIL and Fault Code Requirements*.

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(2.5) Erasing a permanent fault code. The OBD system shall erase a permanent fault code under the following conditions:

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(2.5.2) If all fault information in the on-board computer other than the permanent fault code has been cleared (i.e., through the use of a scan tool or battery disconnect) and the OBD II system is not commanding the MIL on:

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(B) Except as provided for in sections (d)(2.5.2)(D) and (E), if the monitor of the malfunction that caused the permanent fault code to be stored is not subject to the minimum ratio requirements of section (d)(3.2) (e.g., gasoline misfire monitor, fuel system monitor, comprehensive component circuit continuity monitors), the OBD II system shall erase the permanent fault code at the end of a driving cycle if:

(i) The monitor has run and made one or more determinations during a driving cycle that the malfunction of the component or the system is not present and has not made any determinations within the same driving cycle that the malfunction is present;

(ii) The monitor has not made any determinations that the malfunction is present subsequent to the most recent driving cycle in which the criteria of section (d)(2.5.2)(B)(i) are met; and

(iii) The following criteria are satisfied on any single driving cycle (which may be a different driving cycle than that in which the criteria of section (d)(2.5.2)(B)(i) are satisfied):

a. Cumulative time since engine start is greater than or equal to 600 seconds;

b. Except as provided in section (d)(2.5.2)(B)(iii)e. below, ~~C~~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~~1150 rpm in lieu of at or above 25 miles per hour for purposes of this criteria); ~~and~~

c. Continuous vehicle operation at idle (i.e., accelerator pedal released by driver and either vehicle speed less than or equal to one mile per hour or engine speed less than or equal to 200 rpm above normal warmed-up idle (as determined in the drive position for

vehicles equipped with an automatic transmission)) for greater than or equal to 30 seconds; and

d. For 2013 and subsequent model year engines, ~~T~~the monitor has not made any determination that the malfunction is present.

e. For 2004 through 2012 model year medium-duty vehicles with diesel engines certified on an engine dynamometer, manufacturers may use diesel engine operation at or above 15 percent calculated load in lieu of 1150 rpm for the criterion in section (d)(2.5.2)(B)(iii)b. above.

(iv) 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 be met prior to erasure of the permanent fault code.

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(4) *In-Use Monitor Performance Ratio Definition*.

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(4.3) Denominator Specifications

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(4.3.2) Specifications for incrementing:

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(B) The denominator for each monitor shall be incremented within ten seconds if and only if the following criteria are satisfied on a single driving cycle:

(i) Cumulative time since engine start is greater than or equal to 600 seconds while at an elevation of less than 8,000 feet above sea level and at an ambient temperature of greater than or equal to 20 degrees Fahrenheit;

(ii) Except as provided in section (d)(4.3.2)(B)(iv) below, ~~C~~cumulative vehicle operation at or above 25 miles per hour occurs for greater than or equal to 300 seconds while at an elevation of less than 8,000 feet above sea level and at an ambient temperature of greater than or equal to 20 degrees Fahrenheit (medium-duty vehicles with diesel engines certified on an engine dynamometer may use cumulative operation at or above ~~15% calculated load~~1150 rpm in lieu of at or above 25 miles per hour for purposes of this criteria);

(iii) Continuous vehicle operation at idle (i.e., accelerator pedal released by driver and either vehicle speed less than or equal to one mile per hour or engine speed less than or equal to 200 rpm above normal warmed-up idle (as determined in the drive position for vehicles equipped with an automatic transmission)) for greater than or equal to 30 seconds while at an elevation of less than 8,000 feet above sea level and at an ambient temperature of greater than or equal to 20 degrees Fahrenheit~~;~~.

(iv) For 2004 through 2012 model year medium-duty vehicles with diesel engines certified on an engine dynamometer, manufacturers may use diesel engine operation at or above 15 percent calculated load in lieu of 1150 rpm for the criterion in section (d)(4.3.2)(B)(ii) above.

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(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:

(i) Air conditioning system (section (e)(12))

(ii) Variable valve timing and/or control system (sections (e)(13) and (f)(13))

(iii) "Other emission control or source device" (sections (e)(16) and (f)(16))

(iv) Comprehensive component output component (sections (e)(15) and (f)(15)) (e.g., turbocharger waste-gates, variable length manifold runners, torque converter clutch lock-up solenoids, etc.)

(G) For the following monitors, the denominator(s) shall be incremented by one ~~if and only if, in addition to meeting~~ during a driving cycle in which the following two criteria are met: (1) the requirements of section (d)(4.3.2)(B) have been met on at least one driving cycle since the denominator was last incremented, and (2) ~~at least~~ the number of cumulative miles of vehicle operation since the denominator was last incremented is greater than or equal to 500 ~~cumulative~~ miles~~ of vehicle operation have been experienced since the last time the denominator was incremented~~:

(i) Diesel NMHC converting catalyst (section (f)(1.2.2))

(ii) Diesel NMHC converting catalyst other aftertreatment assistance functions (sections (f)(1.2.3)(B) and (f)(1.2.3)(D))

(iii) Diesel PM filter (sections (f)(9.2.1), (f)(9.2.4), and (f)(9.2.5))

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(I) For 2013 and subsequent model year vehicles, ~~I~~in addition to the requirements of section (d)(4.3.2)(B) above, the denominator(s) for the following monitors shall be incremented if and only if a regeneration event is commanded for a time greater than or equal to ten seconds:

(i) Diesel NMHC converting catalyst other aftertreatment assistance functions (sections (f)(1.2.3)(A) and (f)(1.2.3)(C))

(ii) PM filter incomplete regeneration (section (f)(9.2.3))

(iii) PM filter active/intrusive injection (section (f)(9.2.6))

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

ENGINES.

(1) *NON-METHANE HYDROCARBON (NMHC) CONVERTING CATALYST MONITORING*

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[Note: No 15-day changes are proposed for the following sections (f)(1.2.2) and (f)(1.2.3) however the regulatory text was included since it is referenced in the changes proposed above for sections (d)(4.3.2)(G) and (d)(4.3.2)(I).]

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(1.2) Malfunction Criteria:

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(1.2.2) Conversion Efficiency:

(A) The OBD II system shall detect an NMHC catalyst malfunction when the catalyst conversion capability decreases to the point that ~~NMHC~~ emissions exceed:

(i) For passenger cars, light-duty trucks, and MDPVs certified to a chassis dynamometer tailpipe emission standard:

a. 5.0 times the applicable FTP NMHC standards for 2004 through 2009 model year vehicles;

b. 3.0 times the applicable FTP NMHC standards for 2010 through 2012 model year vehicles; and

c. 1.75 times the applicable FTP NMHC standards for 2013 and subsequent model year vehicles.

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

a. 2.5 times the applicable NMHC standards for 2007 through 2012 model year vehicles; and

b. 2.0 times the applicable NMHC standards or the applicable NOx standard by more than 0.2 g/bhp-hr (e.g., cause emissions to exceed 0.4 g/bhp-hr if the emission standard is 0.2 g/bhp-hr) for 2013 and subsequent model year vehicles.

(B) Except as provided below in section (f)(1.2.2)(C), if no failure or deterioration of the catalyst ~~NMHC~~ conversion capability could result in NMHC or NOx emissions exceeding the applicable malfunction criteria of section (f)(1.2.2)(A), the OBD II system shall detect a malfunction when the catalyst has no detectable amount of NMHC or NOx conversion capability.

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(1.2.3) Other Aftertreatment Assistance Functions. Additionally, for 2010 and subsequent model year vehicles, the catalyst(s) shall be monitored for other aftertreatment assistance functions:

(A) For catalysts used to generate an exotherm to assist PM filter regeneration, the OBD II system shall detect a malfunction when the catalyst is unable to generate a sufficient exotherm to achieve regeneration of the PM filter.

(B) For 2010 and subsequent model year passenger cars, light-duty trucks, and MDPVs certified to a chassis dynamometer tailpipe emission standard

and 2013 and subsequent model year medium-duty vehicles (including MDPVs) certified to an engine dynamometer tailpipe emission standard, ~~F~~for catalysts used to generate a feedgas constituency to assist SCR systems (e.g., to increase NO_2 concentration upstream of an SCR system), the OBD II system shall detect a malfunction when the catalyst is unable to generate the necessary feedgas constituents for proper SCR system operation.

(C) For catalysts located downstream of a PM filter and used to convert NMHC emissions during PM filter regeneration, the OBD II system shall detect a malfunction when the catalyst has no detectable amount of NMHC conversion capability.

(D) For catalysts located downstream of an SCR system (e.g., ~~and used~~ to prevent ammonia slip), the OBD II system shall detect a malfunction when the catalyst has no detectable amount of NMHC, CO, NOx, or PM conversion capability. Monitoring of the catalyst shall not be required if there is no measurable emission impact on the criteria pollutants (i.e., NMHC, CO, NOx, and PM) during any reasonable driving condition where the catalyst is most likely to affect criteria pollutants (e.g., during conditions most likely to result in ammonia generation or excessive reductant delivery).

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(3) *MISFIRE MONITORING*

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(3.2) Malfunction Criteria:

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(3.2.4) For multiple cylinder misfire situations that result in a misfire rate greater than or equal to 50 percent of all engine firings, the OBD II system shall only be required to detect a misfire malfunction for situations that are caused by a single component failure.

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(4) *FUEL SYSTEM MONITORING*

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(4.2) Malfunction Criteria:

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(4.2.5) For purposes of determining the fuel system malfunction criteria in sections (~~e~~f)(4.2.1) through (4.2.3) for medium-duty vehicles (including MDPVs) certified to an engine dynamometer tailpipe emission standard, the manufacturer shall do the following:

(A) For 2004 through 2012 model year vehicles, the malfunction criteria shall be established by using a fault that affects either a single injector or all injectors equally.

(B) For 2013 and subsequent model year vehicles, for section (~~e~~f)(4.2.1), the malfunction criteria shall be established by using a fault that affects all injectors equally. Additionally, for systems that have single component failures which could affect a single injector (e.g., systems that build injection pressure within the injector that could have a single component pressure fault caused by the injector itself), the malfunction criteria shall also be established by using a fault that affects a single injector.

(C) For 2013 and subsequent model year vehicles, for sections (~~e~~f)(4.2.2) through (4.2.3), the malfunction criteria shall be established by both (1) a fault that affects all the injectors equally and (2) a fault that affects only one injector.

(4.3) Monitoring Conditions:

(4.3.1) Except as provided in sections (~~e~~f)(4.3.2) and (~~e~~f)(4.3.4), ~~T~~the OBD II system shall monitor continuously for malfunctions identified in sections (f)(4.2.1) and (f)(4.2.4) (i.e., fuel pressure control and feedback operation).

(4.3.2) For fuel systems that achieve injection fuel pressure within the injector or increase pressure within the injector (e.g. in the injector of an amplified common rail system), manufacturers may request Executive Officer approval to define the monitoring conditions for malfunctions identified in sections (~~e~~f)(4.2.1) in accordance with sections (d)(3.1) and (d)(3.2) (i.e., minimum ratio requirements). The Executive Officer shall approve the monitoring conditions upon the manufacturer submitting data and/or analysis identifying all possible failure modes and the effect each has (e.g., failure modes and effects analysis) on fuel pressure across the entire range of engine operating conditions, and upon the Executive Officer determining based on the data and/or analysis that the monitoring conditions allow for robust detection of all causes of fuel pressure malfunctions.

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(6) *EXHAUST GAS RECIRCULATION (EGR) SYSTEM MONITORING*

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(6.2) Malfunction Criteria:

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(6.2.5) EGR Cooler Performance:

(A) The OBD II system shall detect a malfunction of the EGR cooler system ~~cooler~~ at or prior to a reduction from the manufacturer's specified cooling performance that would cause a vehicle's NMHC, CO, NOx, or PM emissions to exceed the applicable emission levels specified in sections (f)(6.2.1)(A)~~.~~.

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(C) For purposes of determining the EGR cooler performance malfunction criteria in section (f)(6.2.5)(A) for EGR cooler systems that consist of more than one cooler (e.g., a pre-cooler and a main cooler, two or more coolers in series), the manufacturer shall submit an EGR cooler system aging and

monitoring plan to the Executive Officer for review and approval. The plan shall include the description and location of each component, the monitoring strategy for each component and combination of components, and the method for determining the malfunction criteria of section ~~(e)(3.2.5)(A)~~ (f)(6.2.5)(A) including the deterioration/aging process. Executive Officer approval of the plan shall be based on the representativeness of the aging to real world EGR cooler system component deterioration under normal and malfunctioning engine operating conditions and the effectiveness of the method used to determine the malfunction criteria of section ~~(e)(3.2.5)(A)~~ (f)(6.2.5)(A).

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(6.3) Monitoring Conditions:

(6.3.1) For malfunctions identified in sections (f)(6.2.1) and (f)(6.2.2) (i.e., EGR low and high flow) manufacturers shall~~, manufacturers shall define monitoring conditions~~:

(A) ~~For 2004 through 2009 model year vehicles,~~ Define monitoring conditions in accordance with sections (d)(3.1) and (d)(3.2) (i.e., minimum ratio requirements) for 2004 through 2009 model year vehicles. For purposes of tracking and reporting as required in section (d)(3.2.2), all monitors used to detect malfunctions identified in sections (f)(6.2.1) and (f)(6.2.2) shall be tracked separately but reported as a single set of values as specified in section (d)(5.2.2);

(B) Except as provided in section (~~e~~f)(6.3.5), ensure that monitoring is ~~C~~conducted continuously for all 2010 and subsequent model year vehicles.

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(7) *BOOST PRESSURE CONTROL SYSTEM MONITORING*

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(7.2) Malfunction Criteria:

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(7.2.3) ~~VGT s~~Slow response:

(A) For 2010 through 2012 model year vehicles equipped with variable geometry turbochargers (VGT), ~~T~~the OBD II system shall detect a malfunction at or prior to any failure or deterioration in the capability of the VGT system to achieve the commanded turbocharger geometry within a manufacturer-specified time that would cause a vehicle's NMHC, CO, NOx, or PM emissions to exceed the applicable emission levels specified in section~~s~~ (f)(7.2.1)(A). For vehicles in which no failure or deterioration of the VGT system response could result in a vehicle's emissions exceeding these levels, the OBD II system shall detect a malfunction of the VGT system when ~~proper functional~~ no detectable response ~~of the system to computer~~ a change in command~~s~~ed turbocharger geometry ~~does not~~ occur~~s~~.

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(7.3) Monitoring Conditions:

(7.3.1) Except as provided in section (~~e~~f)(7.3.4), ~~T~~the OBD II system shall monitor continuously for malfunctions identified in sections (f)(7.2.1), (7.2.2), and (7.2.5) (i.e., over and under boost, feedback control).

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(8) *NOx ADSORBER MONITORING*

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(8.3) Monitoring Conditions:

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(8.3.2) Except as provided in section (~~e~~f)(8.3.3), ~~T~~the OBD II system shall monitor continuously for malfunctions identified in sections (f)(8.2.2) and (8.2.3) (e.g., injection function, feedback control).

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(9) *PARTICULATE MATTER (PM) FILTER MONITORING*

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[Note: No 15-day changes are proposed for the following sections (f)(9.2.1), (f)(9.2.4), and (f)(9.2.5) however the regulatory text was included since it is referenced in the changes proposed above for section (d)(4.3.2)(G).]

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(9.2) Malfunction Criteria:

(9.2.1) Filtering Performance:

(A) The OBD II system shall detect a malfunction prior to a decrease in the filtering capability of the PM filter that would cause a vehicle's PM emissions to exceed:

(i) For passenger cars, light-duty trucks, and MDPVs certified to a chassis dynamometer tailpipe emission standard:

a. 5.0 times the applicable FTP standard for 2004 through 2009 model year vehicles;

b. 4.0 times the applicable FTP standard for 2010 through 2012 model year vehicles; and

c. 1.75 times the applicable FTP standard for 2013 and subsequent model year vehicles.

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

a. 0.09 g/bhp-hr PM as measured from an applicable cycle emission test for 2004 through 2009 model year vehicles;

b. 0.0~~5~~7 g/bhp-hr PM as measured from an applicable cycle emission test for 2010 through 2012 model year vehicles; and

c. 0.03 g/bhp-hr PM as measured from an applicable cycle emission test for 2013 and subsequent model year vehicles.

(B) If no failure or deterioration of the PM filtering performance could result in a vehicle's PM emissions exceeding the applicable malfunction criteria

specified in section (f)(9.2.1)(A), the OBD II system shall detect a malfunction when no detectable amount of PM filtering occurs.

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(9.2.4) NMHC conversion: For 2010 and subsequent model year ~~vehicles~~ passenger cars, light-duty trucks, and MDPVs certified to a chassis dynamometer tailpipe emission standard and 2013 and subsequent model year medium-duty vehicles (including MDPVs) certified to an engine dynamometer tailpipe emission standard 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 section (f)(9.2.2)(A). 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.

(9.2.5) Missing substrate: The OBD II system shall detect a malfunction if either the PM filter substrate is completely destroyed, removed, or missing, or if the PM filter assembly is replaced with a muffler or straight pipe.

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(17) *EXCEPTIONS TO MONITORING REQUIREMENTS*

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(17.6) A manufacturer may request Executive Officer approval to disable monitors that can be affected by PTO activation on vehicles designed to accommodate the installation of PTO units (as defined in section (c)).

(17.6.1) Except as allowed in section (g)(17.6.2) below, a manufacturer may request Executive Officer approval to disable an affected monitor provided disablement occurs only while the PTO unit is active and the OBD II readiness status (specified under section (g)(4.1)) and PTO activation time are appropriately tracked and erased as described in this section. The Executive Officer shall approve the request for disablement based on the manufacturer's demonstration that the affected monitor cannot robustly detect malfunctions (e.g., cannot avoid false passes or false indications of malfunctions) while the PTO unit is active. The OBD II system shall track the cumulative engine runtime with PTO active and clear OBD II readiness status (i.e., set all monitors to indicate "not complete") no later than the start of the next ignition cycle if 750 minutes of cumulative engine runtime with PTO active has occurred since the last time the affected monitor has determined the component or system monitored by the affected monitor is or is not malfunctioning (i.e., has completed). The PTO timer shall pause whenever PTO changes from active to not active and resume counting when PTO is re-activated. The timer shall be reset to zero after the affected monitor has completed and no later than the start of the next ignition cycle. Once the PTO timer has reached 750 minutes and the

OBD II readiness status has been cleared, the PTO timer may not cause the OBD system to clear the readiness status again until after the PTO timer has reset to zero (after the monitor has completed) and again reached 750 minutes.

(17.6.2) In lieu of requesting Executive Officer approval for disabling an affected monitor according to section (f)(17.6.1) above, ~~A~~a manufacturer may disable affected ~~monitoring systems in vehicles designed to accommodate the installation of Power Take-Off (PTO) units (as defined in section (c))~~monitors, provided disablement occurs only while the PTO unit is active, and the OBD II readiness status is cleared by the on-board computer (i.e., all monitors set to indicate "not complete") while the PTO unit is activated ~~(see section (g)(4.1) below)~~. If the disablement occurs, the readiness status may be restored to its state prior to PTO activation when the disablement ends.

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(g) *STANDARDIZATION REQUIREMENTS.*

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(6) *Engine Run Time Tracking Requirements*:

(6.1) For all 2010 and subsequent model year medium-duty vehicles equipped with diesel engines, manufacturers shall implement software algorithms to individually track and report in a standardized format the engine run time while being operated in the following conditions:

(6.1.1) Total engine run time;

(6.1.2) Total idle run time (with "idle" defined as accelerator pedal released by driver, ~~vehicle speed less than or equal to one mile per hour,~~ engine speed greater than or equal to 50 to 150 rpm below the normal warmed-up idle speed (as determined in the drive position for vehicles equipped with an automatic transmission), ~~and~~ PTO not active~~)~~, and either vehicle speed less than or equal to one mile per hour or engine speed less than or equal to 200 rpm above normal warmed-up idle);

(6.1.3) Total run time with PTO active.

(6.1.4) Total run time with EI-AECD #1active;

(6.1.5) Total run time with EI-AECD #2 active; and so on up to

(6.1.6) Total run time with EI-AECD #n active.

(6.1.7) For 2010 through 2012 model year vehicles, manufacturers may define "idle" in section (g)(6.1.2) above as accelerator pedal released by driver, vehicle speed less than or equal to one mile per hour, and PTO not active.

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

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(c) *DEFINITIONS*

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"*Start of production*" is the time when the manufacturer has produced two percent of the projected volume for the engine or vehicle, whichever is ~~being evaluated in accordance with~~ specified in sections (k) and (l).

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(d) *GENERAL REQUIREMENTS*

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(2) ***MIL and Fault Code Requirements*.**

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(2.3) MIL Extinguishing and Fault Code Erasure Protocol.

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(2.3.2) For vehicles using the SAE J1939 protocol for the standardized functions required in section (h):

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(D) Erasing a permanent fault code. The OBD system shall erase a permanent fault code ~~only if either of the~~ under the following conditions ~~occur~~:

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(ii) ~~Subsequent to a clearing of the~~If all fault information in the on-board computer has been cleared (i.e., through the use of a scan tool or battery disconnect) and the OBD system is not commanding the MIL on~~, 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.~~:

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b. If the monitor of the malfunction that caused the permanent fault code to be stored is not subject to the minimum ratio requirements of section (d)(3.2) (e.g., continuous diesel fuel system monitors, comprehensive component circuit continuity monitors), the OBD system shall erase the permanent fault code at the end of a driving cycle if:

1. The monitor has run and made one or more determinations during a driving cycle that the malfunction of the component or the system is not present and has not made any determinations within the same driving cycle that the malfunction is present;
2. The monitor has not made any determinations that the malfunction is present subsequent to the most recent driving

cycle in which the criteria of section (d)(2.3.2)(D)(ii)b.1. are met; and

3. The following criteria are satisfied on any single driving cycle (which may be a different driving cycle than that in which the criteria of section (d)(~~=~~2.3.2)(D)(ii)b.1. are satisfied):

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

ii. Cumulative gasoline engine operation at or above 25 miles per hour or diesel engine operation at or above 1150 rpm, either of which occurs for greater than or equal to 300 seconds; ~~and~~

iii. Continuous vehicle operation at idle (i.e., accelerator pedal released by driver and either vehicle speed less than or equal to one mile per hour or engine speed less than or equal to 200 rpm above normal warmed-up idle (as determined in the drive position for vehicles equipped with an automatic transmission)) for greater than or equal to 30 seconds~~.~~; and

iv. The monitor has not made any determinations that the malfunction is present.

4. Monitors required to use “similar conditions” as defined in section (c) to store and erase pending and confirmed/MIL-on fault codes may not require that the similar conditions be met prior to erasure of the permanent fault code.

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(4) ***In-Use Monitor Performance Ratio Definition*.**

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(4.3) Denominator Specifications

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(4.3.2) Specifications for incrementing:

* * * *

(B) The denominator for each monitor shall be incremented within 10 seconds if and only if the following criteria are satisfied on a single driving cycle:

(i) Cumulative time since start of driving cycle is greater than or equal to 600 seconds while at an elevation of less than 8,000 feet above sea level and at an ambient temperature of greater than or equal to 20 degrees Fahrenheit;

(ii) Cumulative gasoline engine operation at or above 25 miles per hour or diesel engine operation at or above ~~15% calculated load~~1150 rpm, either of which occurs for greater than or equal to 300 seconds while at an elevation of less than 8,000 feet above sea level and at an ambient temperature of greater than or equal to 20 degrees Fahrenheit; and

(iii) Continuous vehicle operation at idle (i.e.~~g.~~, accelerator pedal released by driver and either vehicle speed less than or equal to one mile per

hour or engine speed less than or equal to 200 rpm above normal warmed-up idle (as determined in the drive position for vehicles equipped with an automatic transmission)) for greater than or equal to 30 seconds while at an elevation of less than 8,000 feet above sea level and at an ambient temperature of greater than or equal to 20 degrees Fahrenheit.

(iv) For 2010 through 2012 model year diesel engines, manufacturers may use diesel engine operation at or above 15% calculated load in lieu of 1150 rpm for the criterion in section (d)(4.3.2)(B)(ii) above.

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(E) 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)(D)) shall be incremented if and only if the component is commanded to function (e.g., commanded "on", "open", "closed", "locked") ~~on two or more occasions for greater than two seconds during the driving cycle or~~ for a cumulative time greater than or equal to 10 seconds~~, whichever occurs first~~:

(i) Variable valve timing and/or control system (sections (e)(10) or (f)(9))

(ii) "Other emission control systems" (section (g)(4))

(iii) Comprehensive component output component (section (g)(3)) (e.g., turbocharger waste-gates, variable length manifold runners)

As an alternative, in addition to the requirements of section (d)(4.3.2)(B), manufacturers may use the criteria specified in title 13, CCR section 1968.2(d)(4.3.2)(F) in lieu of the criteria specified in section (d)(4.3.2)(E) above.

* * * *

(G) For monitors of the following components or other emission controls that experience infrequent regeneration events, ~~the manufacturer may request Executive Officer approval to use alternate or additional criteria to that set forth in section (d)(4.3.2)(B) above for incrementing the denominator. Executive Officer approval of the proposed criteria shall be based on the effectiveness of the proposed criteria in measuring the frequency of monitor operation relative to the amount of vehicle operation~~the denominator(s) shall be incremented ~~by one if and only if, in addition to meeting~~ during a driving cycle in which the following two criteria are met: (1) the requirements of section (d)(4.3.2)(B) are met on the current driving cycle, and (2) ~~at least~~ the number of minutes of cumulative engine run time since the denominator was last incremented is greater than or equal to ~~750~~ 800 minutes~~ of cumulative engine run time have occurred since the last time the denominator was incremented~~. The ~~750~~800-minute engine run time counter shall be reset to zero and begin counting again after the denominator has been incremented and no later than the start of the next ignition cycle:

(i) ~~Oxidation~~ Diesel NMHC converting catalyst (section (e)(5.2.2))

(ii) Diesel NMHC converting catalyst other aftertreatment assistance

functions (sections (e)(5.2.3)(B) and (D))
(iii) Particulate matter filters (sections (e)(8.2.1), (8.2.4), and (8.2.5))
As an alternative, for 2010 through 2012 model year engines, the manufacturer may request Executive Officer approval to use alternate or additional criteria to that set forth in section (d)(4.3.2)(G) above for incrementing the denominator. Executive Officer approval of the proposed criteria shall be based on the effectiveness of the proposed criteria in measuring the frequency of monitor operation relative to the amount of vehicle operation.

(H) For 2013 and subsequent model year engines, ~~I~~in addition to the requirements of section (d)(4.3.2)(B) above, the denominator(s) for the following monitors shall be incremented if and only if a regeneration event is commanded for a time greater than or equal to 10 seconds:
(i) Diesel NMHC converting catalyst other aftertreatment assistance functions (sections (e)(5.2.3)(A) and (C))
(ii) PM filter incomplete regeneration (section (e)(8.2.3))
(iii) PM filter active/intrusive injection (section (e)(8.2.6))

* * * *

(e) ***MONITORING REQUIREMENTS FOR DIESEL/COMPRESSION-IGNITION ENGINES***

(1) ***FUEL SYSTEM MONITORING***

* * * *

[Note: No 15-day changes are proposed for the following section (e)(1.2.4) however the regulatory text was included since it is referenced in the changes proposed below for sections (h)(4.1.4) and (h)(4.5.7).]

* * * *

(1.2) Malfunction Criteria:

* * * *

(1.2.4) Feedback control: Except as provided for in section (e)(1.2.5), if the engine is equipped with feedback or feed-forward control of the fuel system (e.g., feedback control of pressure or pilot injection quantity), the OBD system shall detect a malfunction:
(A) If the system fails to begin ~~feedback~~ control within a manufacturer specified time interval;
(B) If a failure or deterioration causes open loop or default operation; or
(C) If ~~feedback~~ the control system has used up all of the adjustment allowed by the manufacturer or reached its maximum authority and cannot achieve the target.

* * * *

(2) ***MISFIRE MONITORING***

* * * *

(2.2) Malfunction Criteria:

* * * *

(2.2.4) For multiple cylinder misfire situations that result in a misfire rate greater than or equal to 50 percent of all engine firings, the OBD system shall only be required to detect a misfire malfunction for situations that are caused by a single component failure.

* * * *

(3) ***EXHAUST GAS RECIRCULATION (EGR) SYSTEM MONITORING***

* * * *

(3.2) Malfunction Criteria:

* * * *

(3.2.4) Feedback control: Except as provided for in section (e)(3.2.~~6~~7), if the engine is equipped with feedback or feed-forward control of the fuel system (e.g., feedback control of flow, valve position, pressure differential across the valve via intake throttle or exhaust backpressure), the OBD system shall detect a malfunction:

(A) If the system fails to begin ~~feedback~~ control within a manufacturer specified time interval;

(B) If a failure or deterioration causes open loop or default operation; or

(C) If ~~feedback~~ the control system has used up all of the adjustment allowed by the manufacturer or reached its maximum authority and cannot achieve the target.

* * * *

[Note: No 15-day changes are proposed for the following sections (e)(4) through (e)(9) however the regulatory text was included since it is referenced in the changes proposed below for sections (h)(4.1.4) and (h)(4.5.7).]

* * * *

(4) ***BOOST PRESSURE CONTROL SYSTEM MONITORING***

* * * *

(4.2) Malfunction Criteria:

* * * *

(4.2.5) Feedback control: Except as provided for in section (e)(4.2.6), if the engine is equipped with feedback or feed-forward control of the boost pressure system (e.g., control of ~~VGT~~ variable geometry turbocharger position, turbine speed, manifold pressure) the OBD system shall detect a malfunction:

(A) If the system fails to begin ~~feedback~~ control within a manufacturer specified time interval;

(B) If a failure or deterioration causes open loop or default operation; or

(C) If ~~feedback~~ the control system has used up all of the adjustment allowed by the manufacturer or reached its maximum authority and cannot achieve the target.

* * * *

(5) ***NON-METHANE HYDROCARBON (NMHC) CONVERTING CATALYST*** **MONITORING**

* * * *

(5.2) Malfunction Criteria:

* * * *

(5.2.2) Conversion Efficiency:

(A) For 2010 through 2012 model year engines, ~~T~~the OBD system shall detect an NMHC catalyst malfunction when the catalyst conversion capability decreases to the point that NMHC emissions exceed 2.0 times any of the applicable standards.

(B) For 2013 and subsequent model year engines, the OBD system shall detect an NMHC catalyst malfunction when the catalyst conversion capability decreases to the point that NMHC emissions exceed 2.0 times any of the applicable standards or NOx emissions exceed any of the applicable standards by more than 0.2 g/bhp-hr (e.g., cause emissions to exceed 0.4 g/bhp-hr if the emission standard is 0.2 g/bhp-hr).

(C) If no failure or deterioration of the catalyst ~~NMHC~~ conversion capability could result in an engine's NMHC or NOx emissions exceeding ~~2.0 times any of~~ the applicable ~~standards~~malfunction criteria of section (e)(5.2.2), the OBD system shall detect a malfunction when the catalyst has no detectable amount of NMHC or NOx conversion capability.

(5.2.3) Other Aftertreatment Assistance Functions:

(A) For catalysts used to generate an exotherm to assist PM filter regeneration, the OBD system shall detect a malfunction when the catalyst is unable to generate a sufficient exotherm to achieve regeneration of the PM filter.

(B) For 2013 and subsequent model year engines, ~~F~~for catalysts used to generate a feedgas constituency to assist SCR systems (e.g., to increase NO_2 concentration upstream of an SCR system), the OBD system shall detect a malfunction when the catalyst is unable to generate the necessary feedgas constituents for proper SCR system operation.

(C) For catalysts located downstream of a PM filter and used to convert NMHC emissions during PM filter regeneration, the OBD system shall detect a malfunction when the catalyst has no detectable amount of NMHC conversion capability.

(D) For catalysts located downstream of an SCR system (e.g., to prevent ammonia slip), the OBD system shall detect a malfunction when the catalyst has no detectable amount of NMHC, CO, NOx, or PM conversion capability. Monitoring of the catalyst is not required if there is no measurable emission impact on the criteria pollutants (i.e., NMHC, CO, NOx, and PM) during any reasonable driving condition where the catalyst is most likely to affect criteria pollutants (e.g., during conditions most likely to result in ammonia generation or excessive reductant delivery).

* * * *

(6) ***OXIDES OF NITROGEN (NOx) CONVERTING CATALYST MONITORING***

* * * *

(6.2) Malfunction Criteria: For purposes of section (e)(6), each catalyst in a series configuration that converts NOx shall be monitored either individually or in combination with others.

* * * *

(6.2.2) Selective Catalytic Reduction (SCR) or Other Active/Intrusive Reductant Injection System Performance:

* * * *

(D) Feedback control: Except as provided for in section (e)(6.2.2)(E), if the engine is equipped with feedback or feed-forward control of the reductant injection, the OBD system shall detect a malfunction:

(i) If the system fails to begin ~~feedback~~ control within a manufacturer specified time interval;

(ii) If a failure or deterioration causes open loop or default operation; or

(iii) If the ~~feedback~~ control system has used up all of the adjustment allowed by the manufacturer or reached its maximum authority and cannot achieve the target.

* * * *

(7) ***NOx ADSORBER MONITORING***

* * * *

(7.2) Malfunction Criteria:

* * * *

(7.2.3) Feedback control: Except as provided for in section (e)(7.2.4), if the engine is equipped with feedback or feed-forward control of the NOx adsorber or active/intrusive injection system (e.g., feedback control of injection quantity, time), the OBD system shall detect a malfunction:

(A) If the system fails to begin ~~feedback~~ control within a manufacturer specified time interval;

(B) If a failure or deterioration causes open loop or default operation; or

(C) If ~~feedback~~ the control system has used up all of the adjustment allowed by the manufacturer or reached its maximum authority and cannot achieve the target.

* * * *

(8) ***PARTICULATE MATTER (PM) FILTER MONITORING***

* * * *

(8.2) Malfunction Criteria:

* * * *

(8.2.7) Feedback Control: Except as provided for in section (e)(8.2.8), if the engine is equipped with feedback or feed-forward control of the PM filter regeneration (e.g., feedback control of oxidation catalyst inlet temperature, PM filter inlet or outlet temperature, in-cylinder or in-exhaust fuel injection), the OBD system shall detect a malfunction:

(A) If the system fails to begin ~~feedback~~ control within a manufacturer specified time interval;

(B) If a failure or deterioration causes open loop or default operation; or

(C) If ~~feedback~~ the control system has used up all of the adjustment allowed by the manufacturer or reached its maximum authority and cannot achieve the target.

* * * *

(9) ***EXHAUST GAS SENSOR MONITORING***

* * * *

(9.2) Malfunction Criteria:

(9.2.1) Air-Fuel Ratio Sensors:

(A) For sensors located upstream of the exhaust aftertreatment:

* * * *

(iii) Feedback faults: The OBD system shall detect a malfunction of the sensor when a sensor failure or deterioration causes an emission control system (e.g., EGR, SCR, or NOx adsorber) to stop using that sensor as a feedback or feed-forward input (e.g., causes default or open-loop operation).

* * * *

(B) For sensors located downstream of the exhaust aftertreatment:

* * * *

(iii) Feedback faults: The OBD system shall detect a malfunction of the sensor when a sensor failure or deterioration causes an emission control system (e.g., EGR, SCR, or NOx adsorber) to stop using that sensor as a feedback or feed-forward input (e.g., causes default or open-loop operation).

* * * *

(9.2.2) NOx and PM sensors:

* * * *

(C) Feedback faults: The OBD system shall detect a malfunction of the sensor when a sensor failure or deterioration causes an emission control system (e.g., EGR, SCR, or NOx adsorber) to stop using that sensor as a feedback or feed-forward input (e.g., causes default or open-loop operation).

* * * *

(f) ***MONITORING REQUIREMENTS FOR GASOLINE/SPARK-IGNITED ENGINES***

(1) ***FUEL SYSTEM MONITORING***

* * * *

(1.2) Malfunction Criteria:

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

(A) ~~t~~The fuel delivery system is unable to maintain an engine's emissions at or below 1.5 times the applicable 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 (f)(1.2.1)(C)) at or below 1.5 times any of the applicable standards; or

(C) ~~Except as required in section (f)(1.2.6), f~~For 2014 and subsequent 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: 3.0 times the applicable standards for the 2014 through 2016 model years; and 1.5 times the applicable FTP standards for all 2017 and subsequent model year vehicles.

(1.2.2) Except as provided for in section (f)(1.2.3) below, if the engine is equipped with adaptive feedback control, the OBD system shall detect a malfunction when the adaptive feedback control has used up all of the adjustment allowed by the manufacturer.

* * * *

(1.2.4) The OBD system shall detect a malfunction whenever the fuel control system fails to enter closed-loop operation within an Executive Officer-approved time interval after engine start. Executive Officer approval of the time interval shall be granted upon determining that the data and/or engineering evaluation submitted by the manufacturer supports the specified times.

(1.2.5) For engines that employ engine shutoff strategies that do not require the vehicle operator to restart the engine to continue driving (e.g., hybrid bus with engine shutoff at idle), the OBD system shall detect whenever the fuel control system fails to enter closed-loop operation within an Executive Officer-approved time interval after an engine restart. Executive Officer approval of the time interval shall be granted upon determining that the data and/or engineering evaluation submitted by the manufacturer supports the specified times.

~~(1.2.5) Manufacturers may adjust the malfunction criteria and/or monitoring conditions to compensate for changes in altitude, for temporary~~

~~introduction of large amounts of purge vapor, or for other similar identifiable operating conditions when they occur.~~

~~(1.2.6) Notwithstanding the phase-in specified in section (f)(1.2.1)(C), if a vehicle is equipped with separate EGR flow delivery passageways (internal or external) that deliver EGR flow to individual cylinders (e.g., an EGR system with individual delivery pipes to each cylinder), the OBD system shall monitor the fuel delivery system for malfunctions specified in section (f)(1.2.1)(C) on all 2014 and subsequent model year vehicles so equipped.~~

(1.3) Monitoring Conditions:

(1.3.1) Except as provided in section (f)(1.3.5), ~~T~~the OBD system shall monitor ~~fuel system shall be monitored~~ continuously for ~~the presence of a~~ malfunctions identified in sections (f)(1.2.1)(A), ~~and~~ (f)(1.2.1)(B), and (f)(1.2.2) (~~e.g.~~i.e., fuel delivery system, secondary feedback control, adaptive feedback control).

* * * *

(8) ***EXHAUST GAS SENSOR MONITORING***

* * * *

[Note: No 15-day changes are proposed for the following sections (f)(8.2.1) and (f)(8.2.2) however the regulatory text was included since it is referenced in the changes proposed below for sections (h)(4.1.4) and (h)(4.5.7).]

* * * *

(8.2) Malfunction Criteria:

(8.2.1) Primary Sensors:

* * * *

(C) The OBD system shall detect a malfunction of the ~~exhaust gas~~oxygen sensor when a sensor failure or deterioration causes the fuel system to stop using that sensor as a feedback input (e.g., causes default or open-loop operation) or causes the fuel system to fail to enter closed-loop operation within a manufacturer-specified time interval.

* * * *

(8.2.2) Secondary Sensors:

* * * *

(E) The OBD system shall detect a malfunction of the ~~exhaust gas~~oxygen sensor when a sensor failure or deterioration causes the fuel system (e.g., fuel control) to stop using that sensor as a feedback input (e.g., causes default or open-loop operation).

* * * *

(g) ***MONITORING REQUIREMENTS FOR ALL ENGINES***

* * * *

(3) ***COMPREHENSIVE COMPONENT MONITORING***

(3.1) Requirement:

(3.1.1) Except as provided in sections (g)(3.1.4), (g)(3.1.5), (g)(3.1.6), and (g)(4), the OBD system shall monitor for malfunction any electronic engine component/system not otherwise described in sections (e)(1) through (g)(2) that either provides input to (directly or indirectly) or receives commands from the on-board computer(s), and: (1) can affect emissions during any reasonable in-use driving condition, or (2) is used as part of the diagnostic strategy for any other monitored system or component.

* * * *

(3.1.3) Manufacturers shall monitor for malfunction electronic powertrain input or output components/systems associated with an electronic transfer case, electronic power steering system, or other components that are driven by the engine and not related to the control of fueling, air handling, or emissions only if the ~~transfer case~~ component or system is used as part of the diagnostic strategy for any other monitored system or component~~For purposes of section (g)(3), "electronic engine components/systems" does not include components that are driven by the engine and are not related to the control of the fueling, air handling, or emissions of the engine (e.g., PTO components, air conditioning system components, and power steering components)~~.

* * * *

(3.1.6) For OBD systems that receive vehicle speed information from a transmission control unit and use vehicle speed as part of the diagnostic strategy for any other OBD monitored system or component:

(A) The OBD system shall monitor the vehicle speed information to the extent feasible in accordance with the requirements of section (g)(3);

(B) The OBD system shall detect a fault and illuminate the MIL when the OBD system is unable to properly receive the vehicle speed information; and

(C) If the transmission control unit monitors the vehicle speed information and indicates an error of the information to the OBD system (e.g., valid vehicle speed data is no longer available), the OBD system shall handle the error indication as a default mode of operation subject to the MIL illumination requirements under section (d)(2.2).

* * * *

(5) ***EXCEPTIONS TO MONITORING REQUIREMENTS***

* * * *

(5.6) A manufacturer may request Executive Officer approval to disable monitors that can be affected by PTO activation on engines or vehicles designed to accommodate the installation of PTO units (as defined in section (c)).

(5.6.1) Except as allowed in section (g)(5.6.2) below, a manufacturer may request Executive Officer approval to disable an affected monitor provided disablement occurs only while the PTO unit is active and the OBD readiness status (specified under section (h)(4.1)) and PTO activation time are appropriately tracked and erased as described in this section. The Executive Officer shall approve the request for disablement based on the

manufacturer's demonstration that the affected monitor cannot robustly detect malfunctions (e.g., cannot avoid false passes or false indications of malfunctions) while the PTO unit is active. The OBD system shall track the cumulative engine runtime with PTO active and clear OBD readiness status (i.e., set all monitors to indicate "not complete") no later than the start of the next ignition cycle if 750 minutes of cumulative engine runtime with PTO active has occurred since the last time the affected monitor has determined the component or system monitored by the affected monitor is or is not malfunctioning (i.e., has completed). The PTO timer shall pause whenever PTO changes from active to not active and resume counting when PTO is re-activated. The timer shall be reset to zero after the affected monitor has completed and no later than the start of the next ignition cycle. Once the PTO timer has reached 750 minutes and the OBD readiness status has been cleared, the PTO timer may not cause the OBD system to clear the readiness status again until after the PTO timer has reset to zero (after the monitor has completed) and again reached 750 minutes.

(5.6.2) For 2010 through 2012 model year engines, in lieu of requesting Executive Officer approval for disabling an affected monitor according to section (g)(5.6.1) above, ~~A~~a manufacturer may disable affected ~~monitoring~~ monitors ~~systems in vehicles designed to accommodate the installation of PTO units (as defined in section (c))~~, provided disablement occurs only while the PTO unit is active, and the OBD readiness status is cleared by the on-board computer (i.e., all monitors set to indicate "not complete") while the PTO unit is activated ~~(see section (h)(4.1) below)~~. If the disablement occurs, the readiness status may be restored to its state prior to PTO activation when the disablement ends.

* * * *

(h) ***STANDARDIZATION REQUIREMENTS***

* * * *

(4) ***Required Emission Related Functions:***

* * * *

(4.1) Readiness Status: In accordance with SAE J1979/J1939-73 specifications, the OBD 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 (f)(9), and (g)(3) except (e)(11) and (f)(4). The readiness status for ~~A~~all components or systems identified in ~~(f)(1),~~ (f)(2)~~, or~~ and (g)(3) ~~that are monitored continuously~~ shall always indicate "complete". The readiness status for all other ~~C~~components or systems ~~that are not subject to continuous monitoring~~ shall immediately indicate "complete" upon the respective ~~diagnostic~~monitor(s) (except those monitors specified under section (h)(4.1.4) below) ~~being fully executed and~~ determining that the component or system is not malfunctioning. The readiness status for ~~A~~a component or system shall also indicate "complete" if

after the requisite number of decisions necessary for determining MIL status has been fully executed, the monitor indicates a malfunction for the component or system. The readiness 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 readiness status to indicate "not complete".

* * * *

(4.1.4) Manufacturers are not required to use the following monitors in determining the readiness status for the specific component or system:

(A) Circuit and out-of-range monitors that are required to be continuous;

(B) Gasoline and diesel exhaust gas sensor feedback monitors specified in sections (e)(9.2.1)(A)(iii), (e)(9.2.1)(B)(iii), (e)(9.2.2)(C), (f)(8.2.1)(C), and (f)(8.2.2)(E);

(C) Diesel feedback control monitors specified in sections (e)(1.2.4), (e)(3.2.4), (e)(4.2.5), (e)(6.2.2)(D), (e)(7.2.3), and (e)(8.2.7);

(D) Gasoline fuel system monitors specified in sections (f)(1.2.1)(A), (f)(1.2.1)(B), (f)(1.2.2), (f)(1.2.4), and (f)(1.2.5).

* * * *

(4.5) Test Results:

* * * *

(4.5.7) The requirements of section (h)(4.5) do not apply to ~~continuous~~ gasoline fuel system monitor~~ing~~s specified under sections (f)(1.2.1)(A), (f)(1.2.1)(B), (f)(1.2.2), (f)(1.2.4), and (f)(1.2.5), ~~gasoline~~ exhaust gas sensor monitor~~ing~~s specified under sections (e)(9.2.1)(A)(iii), (e)(9.2.1)(B)(iii), (e)(9.2.2)(C), (f)(8.2.1)(C), and (f)(8.2.2)(E), cold start emission reduction strategy monitor~~ing~~s, ~~and continuous~~ circuit ~~monitoring, continuous~~and out-of-range monitor~~ing~~s that are required to be continuous, and diesel feedback control monitor~~ing~~s specified under sections (e)(1.2.4), (e)(3.2.4), (e)(4.2.5), (e)(6.2.2)(D), (e)(7.2.3), and (e)(8.2.7).

* * * *

(4.7) Software Calibration Verification Number:

* * * *

~~(4.7.4)~~ (4.7.5) For purposes of Inspection and Maintenance (I/M) testing, manufacturers shall make the CVN and CAL ID combination information available for all 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 ~~XX~~ F of ARB Mail-Out #MSC ~~XX-XX-~~09-22, ~~Month Date, Year,~~ July 7, 2009, 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.

* * * *

(4.8) Vehicle and Engine Identification Numbers:

* * * *

~~(4.8.2)~~ (4.8.3) If the VIN or ESN is reprogrammable, all emission-related diagnostic information identified in section (h)(~~4.9.1~~4.10.1) shall be erased in conjunction with reprogramming of the VIN or the ESN.

* * * *

(5) ***Tracking Requirements:***

* * * *

(5.2) Engine Run Time Tracking Requirements:

(5.2.1) For all gasoline and diesel engines, manufacturers shall implement software algorithms to individually track and report in a standardized format the engine run time while being operated in the following conditions:

(A) Total engine run time;

(B) Total idle run time (with "idle" defined as accelerator pedal released by driver, ~~vehicle speed less than or equal to one mile per hour,~~ engine speed greater than or equal to 50 to 150 rpm below the normal~~,~~ warmed-up idle speed (as determined in the drive position for vehicles equipped with an automatic transmission), ~~and~~ PTO not active~~)~~, and either vehicle speed less than or equal to one mile per hour or engine speed less than or equal to 200 rpm above normal warmed-up idle), and;

(C) Total run time with PTO active~~.~~;

(D) For 2013 and subsequent model year diesel engines only:

(i) total run time with EI-AECD #1active;

(ii) total run time with EI-AECD #2 active; and so on up to

(iii) total run time with EI-AECD #n active.

* * * *

(j) ***CERTIFICATION DOCUMENTATION***

* * * *

(2.2) A table, in the standardized format detailed in Attachment ~~A XX~~ C of ARB Mail-Out #~~95-20XX-XX~~ MSC 09-22~~, May 22, 1995 Month Date, Year~~, July 7, 2009, incorporated by reference.

* * * *

(2.17) A checklist of all the malfunction criteria in sections (e)~~, or~~ (f), and (g) and the corresponding diagnostic noted by fault code for each malfunction criterion. The formats of the checklists are detailed in Attachments ~~XX~~ G and ~~XX~~ H of ARB Mail-Out #MSC ~~XX-XX~~09-22, ~~Month Date, Year,~~ July 7, 2009, incorporated by reference.

* * * *

(k) ***DEFICIENCIES***

* * * *

(6) Request for retroactive deficiencies

(6.1) During either the first 6 months after commencement of ~~normal~~ the start of

engine production or the first 3 months after commencement of the start of vehicle production, whichever is later, manufacturers may request that the Executive Officer grant a deficiency and amend an engine's certification to conform to the granting of the deficiencies for each aspect of the monitoring system: (a) identified by the manufacturer (during testing required by section (l)(2) or any other testing) to be functioning different than the certified system or otherwise not meeting the requirements of any aspect of section 1971.1; and (b) reported to the Executive Officer. If the Executive Officer grants the deficiency(ies) and amended the certification, their approval would be retroactive to the start of production all affected engines within the engine family.

* * * *

(l) ***PRODUCTION ENGINE/VEHICLE EVALUATION TESTING***

(1) ***Verification of Standardized Requirements.***

(1.1) Requirement: Manufacturers shall perform testing to verify that 2013 and subsequent model year production vehicles meet the requirements of section (h)(3) and (h)(4) relevant to proper communication of required emission-related messages to an SAE J1978/J1939 scan tool.

(1.2) Selection of Test Vehicles:

(1.2.1) Engine manufacturers shall perform this testing every model year on ten unique production vehicles (i.e., engine rating and chassis application combination) per engine family. If there are less than ten unique production vehicles for a certain engine family, the manufacturer shall test each unique production vehicle in that engine family. Manufacturers shall perform this testing within no later than either three months of after the start of engine production or one month of after the start of vehicle production, whichever is later. Manufacturers may request Executive Officer approval to group multiple production vehicles together and test one representative vehicle per group. The Executive Officer shall approve the request upon finding that the software and hardware designed to comply with the standardization requirements of section (h) (e.g., communication protocol message timing, number of supported data stream parameters, engine and vehicle communication network architecture) in the representative vehicle are identical to all others in the group and that any differences in the production vehicles are not relevant with respect to meeting the criteria in section (l)(1.4).

* * * *

(2) ***Verification of Monitoring Requirements.***

(2.1) Within No later than either the first six months of after the start of engine production or the first three months of after the start of vehicle production, whichever is later, manufacturers shall conduct a complete evaluation of the OBD system of one or more production vehicles (test vehicles) and submit the results of the evaluation to the Executive Officer.

* * * *

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

* * * *

(d) *Remedial Action.*

* * * *

(2) *Influenced OBD-Related Recalls*.

(A) Upon being notified by the Executive Officer, pursuant to section (b)(7)(G), that an engine class is equipped with a nonconforming OBD system, the manufacturer may, within 45 days from the date of service of such notification, elect to conduct an influenced OBD-related recall of all engines within the engine class for the purpose of correcting the nonconforming OBD systems. Upon such an election, the manufacturer shall, within 45 days from the date of such election, submit an influenced OBD-related recall plan for approval, as prescribed under section (e)(1) below.

* * * *

(3) *Ordered Remedial Action-Mandatory Recall*.

(A) Except as provided in sections (d)(3)(B) below, the Executive Officer shall order the recall and repair of all engines in an engine class that have been determined to be equipped with a nonconforming OBD system if enforcement testing conducted pursuant to sections (b) or (c) above or information received from the manufacturer indicates that:

(i) For major monitors required to meet the in-use performance ratio pursuant to Cal. Code Regs., title 13, section 1971.1(d)(3.2) on 2016 and subsequent model year engines, the average in-use monitor performance ratio for one or more of the major monitors in the test sample group is less than or equal to 33.0 percent of the applicable required minimum ratio established in Cal. Code Regs., title 13, section ~~1968.2~~ 1971.1(d)(3.2.2) (e.g., if the required ratio is 0.100, less than or equal to a ratio of 0.033) or 66.0 percent or more of the vehicles in the test sample group have an in-use monitor performance ratio of less than or equal to 33.0 percent of the applicable required minimum ratio established in Cal. Code Regs., title 13, section ~~1968.2~~ 1971.1(d)(3.2.2) for the same major monitor.

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(e) *Requirements for Implementing Remedial Actions.*

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(6) *Record Keeping and Reporting Requirements*.

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(E) The information gathered by the manufacturer to compile the reports required by these procedures must be retained for no less than one year beyond when engines within the engine class, on average, exceed the defined full useful life of the engines and must be made available to authorized personnel of ARB upon request.

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