

Appendix C-A-1

Purpose and Rationale for Proposed Amendments to Title 13 Regulation Order

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Section 1956.8. Exhaust Emissions Standards and Test Procedures - 1985 through 2026 Model Heavy-Duty Engines and Vehicles, 2021 and Subsequent Zero-Emission Powertrains, and 2022 through 2026 Model Heavy-Duty Hybrid Powertrains

Section Title

Purpose

The title of the section has been amended from “Exhaust Emissions Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Engines and Vehicles, 2021 and Subsequent Zero-Emission Powertrains, and 2022 and Subsequent Model Heavy-Duty Hybrid Powertrains” to “Exhaust Emissions Standards and Test Procedures - 1985 through 2026 Model Heavy-Duty Engines and Vehicles, 2021 and Subsequent Model Zero-Emission Powertrains, and 2022 through 2026 Model Heavy-Duty Hybrid Powertrains.” The purpose of this amendment is to indicate that these existing emission standards and test procedures for heavy-duty (HD) internal combustion engines, vehicles, and hybrid powertrains are only applicable through the end of the 2026 model year (MY).

Rationale

The proposed amendments are necessary to specify that the existing emission standards and test procedures for HD internal combustion engines, heavy-duty vehicles (HDV) and HD hybrid powertrains only extend to the 2026 MY. All existing requirements for Heavy-Duty engines (HDE), HDVs and HD hybrid powertrains will only apply through the end of the 2026 MY, and a new set of emission standards and test procedures will be introduced to cover all HDE, HDV and HD hybrid powertrain productions for 2027 and subsequent MYs. However, note that the requirements for Heavy-Duty Zero-emission (HD-ZE) powertrain certification in this section would continue to be applicable for 2027 and subsequent MYs.

Subsection (a)(2)(C)1 and (a)(2)(C)3

Purpose

The purpose of this subsection is to specify the exhaust emission standards for 2024 through 2026 MY HDEs. The referenced test procedures have been amended from “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles” (2004-DTPS) to “California Exhaust Emission Standards and Test Procedures for 2004 through 2026 Model Heavy-Duty Diesel Engines and Vehicles” (2026-DTPS). In addition, referenced subsection (a)(2)(F) is renumbered to (a)(2)(E) because of the deletion of subsection (a)(2)(D).

Rationale

The proposed amendments are necessary to modify the title of the referenced test procedures in this subsection because the title of the document has been modified in this rulemaking. It is

also necessary to ensure that the renumbered subsection is properly referenced by the regulations.

Subsection (a)(2)(D)

Purpose

The purpose of this subsection is to specify the exhaust emission standards for new 2027 and subsequent model HDEs. This subsection has been deleted since the applicability requirement for HDEs in this section ends in the 2026 MY. The existing subsequent subsections are renumbered because of the deletion of this subsection.

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this section. The 2027 and subsequent MY requirements are specified in the proposed Title 13, California Code of Regulations, section 1956.8.2 (title 13, CCR, section 1956.8.2).

Subsection (a)(2)(E)

Purpose

The purpose of this subsection is to provide an option for engine manufacturers to certify to the optional low oxides of nitrogen (NOx) emission standards. This subsection has been modified to end the applicability in the 2026 MY. The title of the table for this subsection has also been modified to end the applicability in the 2026 MY and delete the optional low NOx emission standards for 2027 and subsequent MY HDEs. This subsection is renumbered to (a)(2)(D) because of the deletion of old subsection (a)(2)(D).

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this section. The 2027 and subsequent MY requirements are specified in the proposed title 13, CCR, section 1956.8.2.

Subsection (a)(2)(F)

Purpose

This subsection provides diesel-fuel bus and engine exemption to support transit agencies with clean fleet purchase requirements in the Innovative Clean Transit regulation. If an exemption request is granted, the transit agency can purchase or re-power buses with engines that are certified to 2010 federal emission standards. The purpose of this amendment is to indicate that the exemption provision is only applicable through the end of the 2026 MY. This subsection is renumbered to (a)(2)(E) because of the deletion of old subsection (a)(2)(D). Therefore, some of the references in this subsection have also been renumbered accordingly.

Rationale

The proposed amendments are necessary to phase out the existing exemption provision by the end of the 2026 MY. California Air Resources Board (CARB) staff is proposing to largely align with the federal emission standards starting with the 2027 MY, and this exemption provision will therefore no longer be needed after the 2026 MY.

Subsection (a)(3)

Purpose

The purpose of this subsection is to establish formaldehyde exhaust emission standards for new 1993 and subsequent model methanol-fueled diesel engines. This subsection has been modified to end the applicability in the 2026 MY.

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this section. The 2027 and subsequent MY requirements are specified in the proposed title 13, CCR, section 1956.8.2.

Subsection (a)(5)

Purpose

The purpose of this subsection is to prohibit the discharge of crankcase emissions directly into the ambient atmosphere from new 2007 and later MY Heavy-Duty diesel engines (HDDE) with a few exceptions. This subsection has been modified to end the applicability in the 2026 MY.

Rationale

The proposed amendment is necessary to reflect the MY requirement, i.e., ending in the 2026 MY. This amendment would make the applicability criteria consistent throughout the section. The 2027 and subsequent MY requirements are specified in the proposed title 13, CCR, section 1956.8.2.

Subsection (a)(6)

Purpose

The purpose of this subsection is to establish idling requirements for HDDEs. This subsection has been modified to end the applicability in the 2026 MY. The referenced test procedures have been amended from 2004-DTPS to 2026-DTPS.

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this

section. The 2027 and subsequent MY requirements are specified in the proposed title 13, CCR, section 1956.8.2.

Subsection (a)(7)

Purpose

The purpose of this subsection is to establish greenhouse gas (GHG) emission standards for new 2014 and subsequent model HDDEs, as well as HD natural gas-fueled, liquefied-petroleum-gas-fueled, and methanol-fueled engines derived from diesel-cycle engines. This subsection has been modified to end the applicability in the 2026 MY. GHG emission standards for 2027 and subsequent MY HDEs are deleted from the table for this subsection.

Rationale

The proposed amendments are necessary to reflect MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this CCR section. The 2027 and subsequent MY GHG standards and requirements have been moved to the proposed title 13, CCR, section 1956.8.2. No changes have been made to 2027 and subsequent MY GHG standards and requirements. The actual GHG standards and requirements have only been moved to the new title 13, CCR, section 1956.8.2 to make it easier for stakeholders to look up both the criteria pollutant and GHG standards for 2027 and later MYs in one document.

Subsection (a)(9)

Purpose

The purpose of this subsection is to specify the exhaust emission standards for optionally certified diesel hybrid powertrains used in hybrid vehicles. This subsection has been modified to end the applicability in the 2026 MY.

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this section. The 2027 and subsequent MY requirements are specified in the proposed title 13, CCR, section 1956.8.2.

Subsection (b)

Purpose

The purpose of this subsection is to explain applicable test procedures for HDDEs, HDVs, and HD diesel hybrid powertrains, and the requirements for participating in the averaging, banking and trading programs. This subsection has been modified to end the applicability in the 2026 MY. The proposed amendment also creates placeholders for the most recent date of incorporation of CARB staff's amended test procedures.

Rationale

The proposed amendments are necessary to phase out the existing test procedures by the end of the 2026 MY. These amendments would make the applicability criteria consistent throughout this section. These amendments are also necessary to ensure that CARB staff's most recently amended version of the test procedures is properly referenced by the regulations.

Subsection (c)(1)(B)

Purpose

The purpose of this subsection is to list the emission standards for new 2005 through 2023 model HD Otto-cycle engines. The referenced test procedures in footnote F have been amended from "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines" (2004-OTTO-TPS) to "California Exhaust Emission Standards and Test Procedures for 2004 and through 2026 Model Heavy-Duty Otto-Cycle Engines" (2026-OTTO-TPS).

Rationale

The proposed amendment is necessary to modify the title of the referenced test procedures in this subsection because the title of the document has been modified in this rulemaking.

Subsection (c)(1)(C)

Purpose

The purpose of this subsection is to specify the applicable emission standards and requirements for Otto-cycle HDEs used in vehicles over 14,000 pounds (lb) gross vehicle weight rating (GVWR) and Otto-cycle engines used in incomplete medium-duty vehicles (MDV) 10,001 to 14,000 lb GVWR. The subsection and title of the table have been modified to end the applicability in the 2026 MY. The table is also modified to delete the requirements for 2027 and subsequent MYs. The footnote is also modified to indicate the additional reference (title 13, CCR, section 1961.4).

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this section. The 2027 and subsequent MY requirements are specified in the proposed title 13, CCR, section 1956.8.2. An additional reference is needed to refer to the requirements under title 13, CCR, section 1961.4, which took effect on November 30, 2022.

Subsection (c)(1)(D)

Purpose

The purpose of this subsection is to specify the applicable emission standards and requirements for Otto-cycle HDEs used in vehicles over 14,000 lb GVWR. The subsection and title of the table have been modified to end the applicability in the 2026 MY. The table is also modified to delete the requirements for the 2027 and subsequent MYs.

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this section. The 2027 and subsequent MY requirements are specified in the proposed title 13, CCR, section 1956.8.2.

Subsection (c)(2)

Purpose

The purpose of this subsection is to establish formaldehyde exhaust emission standards for new 1993 and subsequent model methanol-fueled Otto-cycle engines. This subsection has been modified to end the applicability in the 2026 MY.

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this section. The 2027 and subsequent MY requirements are specified in the proposed title 13, CCR, section 1956.8.2.

Subsection (c)(4)

Purpose

The purpose of this subsection is to establish GHG emission standards for 2016 and subsequent model Otto-cycle HDEs. This subsection has been modified to end the applicability in the 2026 MY. The table for this subsection has also been modified to end the applicability in the 2026 MY and delete the carbon dioxide (CO₂) emission standards for the 2027 and subsequent MY Otto-cycle engines.

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this CCR section. The 2027 and subsequent MY GHG standards and requirements have been moved to the proposed title 13, CCR, section 1956.8.2. No changes have been made to the 2027 and subsequent MY GHG standards and requirements. The actual GHG standards and requirements have only been moved to the new title 13, CCR, section 1956.8.2 to make it

easier for stakeholders to look up both the criteria pollutant and GHG standards for 2027 and later MYs in one document.

Subsection (c)(5)

Purpose

The purpose of this subsection is to specify the applicable emission standards and requirements for optionally certified Otto-cycle hybrid powertrains. The subsections have been modified to end the applicability in the 2026 MY.

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this section. The 2027 and subsequent MY requirements are specified in the proposed title 13, CCR, section 1956.8.2.

Subsection (d)

Purpose

The purpose of this subsection is to explain applicable test procedures for HD Otto-cycle engines and vehicles and Otto-cycle hybrid powertrains. This subsection has been modified to end the applicability in the 2026 MY. The referenced test procedures have been amended from 2004-OTTO-TPS to 2026-OTTO-TPS. The proposed amendments also create placeholders for the most recent date of incorporation of CARB staff's amended test procedures described above. Reference to section 1961.4 is added since it also incorporates "California Non-Methane Organic Gas Test Procedures for 2017 and Subsequent MY Vehicles."

Rationale

The proposed amendments are necessary to phase out the existing test procedures by the end of the 2026 MY. These amendments would make the applicability criteria consistent throughout the section. The proposed amendments are also necessary to ensure that CARB staff's most recently amended version of the test procedures is properly referenced by the regulations.

Subsection (f)

Purpose

The purpose of this subsection is to allow the use of federal-certified HDEs in limited numbers when no suitable California-certified engines are available. The subsections have been modified to end the applicability in the 2026 MY.

Rationale

The proposed amendment is necessary to reflect the MY requirement. This amendment would make the applicability criteria consistent throughout the section.

Subsection (h)(2)

Purpose

The purpose of this subsection is to specify the applicable emission standards and requirements for engines used in 1992 through 2004 model incomplete Otto-cycle MD low-emission vehicles (LEV), ultra-low-emission vehicles (ULEV), and super ultra-low-emission vehicles (SULEV), and 1992 through 2023 model diesel engines used in MD LEVs, ULEVs, and SULEVs. The referenced test procedures in footnotes J and K in the table for this subsection have been modified from 2004-DTPS to 2026-DTPS.

Rationale

The proposed amendments are necessary to modify the title of the referenced test procedures in this subsection because the title of the document has been modified in this rulemaking.

Subsection (h)(4)

Purpose

The purpose of this subsection is to prohibit the discharge of crankcase emissions directly into the ambient atmosphere from new 2007 through 2026 MY HDDEs with a few exceptions. The subsections have been modified to end the applicability in the 2026 MY.

Rationale

The proposed amendment is necessary to reflect the applicable MY, i.e., ending in the 2026 MY. The 2027 and subsequent MY requirements are specified in the proposed title 13, CCR, section 1956.8.2.

Subsection (h)(6)

Purpose

The purpose of this subsection is to specify GHG emission standards for new HD diesel and Otto-cycle engines used in MD LEVs, ULEVs, and SULEVs. This subsection has been modified to end the applicability in the 2026 MY. The table for this subsection has also been modified to end the applicability in the 2026 MY and delete the CO₂ emission standards for 2027 and subsequent MY diesel engines.

Rationale

The proposed amendments are necessary to reflect MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this CCR section. The 2027 and subsequent MY GHG standards and requirements have been moved to

the proposed title 13, CCR, section 1956.8.2. No changes have been made to the 2027 and subsequent MY GHG standards and requirements. The actual GHG standards and requirements have only been moved to the new title 13, CCR, section 1956.8.2 to make it easier for stakeholders to look up both the criteria pollutant and GHG standards for 2027 and later MYs in one document.

Subsection (h)(7)

Purpose

The purpose of this subsection is to specify the exhaust emission standards for HDEs used in MDVs with 10,001 to 14,000 lb GVWR. This subsection has been modified to end the applicability in the 2026 MY. The exhaust emission standards for 2027 and subsequent MY have been deleted. The footnote is modified to indicate the additional reference (title 13, CCR, section 1961.4).

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this section. The 2027 and subsequent MY requirements are specified in the proposed title 13, CCR, section 1956.8.2. An additional reference is needed to refer to the requirements under title 13, CCR, section 1961.4 which became effective on November 30, 2022.

Subsection (j)(5)

Purpose

The purpose of this section is to define the term "exempt bus" used in the provision of transit agency diesel-fueled bus and engine exemption as specified in subsection (a)(2)(F) (which is renumbered to (a)(2)(E) in the proposed amendments). This definition has been modified to end the applicability in the 2026 MY. "Oct." is spelled out for clarity purpose.

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this section.

Subsections (j)(11) and (12)

Purpose

The purpose of these subsections was to define the term "intermediate useful life" and "intermediate useful life NOx standard" used for 2027 and subsequent MY heavy HDDE NOx standards. These definitions are deleted because this section has been modified to end the applicability in the 2026 MY. The existing subsequent subsections are renumbered because of the deletion of these two subsections.

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY. These amendments would make the applicability criteria consistent throughout this section.

Subsections (j)(13) and (14)

Purpose

The purpose of this amendment is to renumber old subsections (j)(13) and (j)(14) to new subsections (j)(11) and (j)(12).

Rationale

The proposed amendment is necessary to maintain sequence with other subsections after the deletion of old subsections (j)(11) and (j)(12).

Subsection (j)(15)

Purpose

The purpose of this subsection is to define the “low-load cycle.” This subsection is amended to properly reference the corresponding definition in the incorporated test procedures. In addition, this subsection is renumbered to (j)(13).

Rationale

The proposed amendments are necessary to maintain sequence with other subsections after the deletion of old subsections (j)(11) and (j)(12) and to properly reference the incorporated test procedures with applicability ending in the 2026 MY.

Subsections (j)(16) through (j)(27)

Purpose

The purpose of this amendment is to renumber old subsections (j)(16) through (j)(27) to new subsections (j)(14) through (j)(25).

Rationale

The proposed amendment is necessary to maintain sequence with other subsections after the deletion of old subsections (j)(11) and (j)(12).

Section 1965. Emission Control, Smog Index, and Environmental Performance Labels - 1979 and Subsequent Model-Year Motor Vehicles

Purpose

The purpose of this section is to outline the requirements for emission control, smog index, and environmental performance labels for 1979 and subsequent MY motor vehicles. The proposed amendments change the referenced test procedure from 2004-DTPS to 2026-DTPS and introduce the new “California Exhaust Emission Standards and Test Procedures for 2027 and Subsequent Model Heavy-Duty Engines, Vehicles and Hybrid Powertrains,” which will take effect starting with the 2027 MY.

Rationale

The proposed amendments are necessary to properly reference the most recently amended version of the test procedures. All requirements in the existing test procedures will only apply through the end of the 2026 MY, and a new set of test procedures incorporated by reference in section 1956.8.2(c) will be introduced to cover all HDE productions for 2027 and subsequent MYs.

Section 1968.2. Malfunction and Diagnostic System Requirements--2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines.

Subsection (c) “Family Emission Limit (FEL)” and “Supplemental Emission Test (SET) standard”

Purpose

The purpose of the proposed amendments to these definitions is to indicate that the reference to title 13, CCR, section 1956.8.2 will be used instead of the reference to title 13, CCR, section 1956.8 if the former is applicable.

Rationale

The proposed amendments are needed to account for the newly proposed regulation section 1956.8.2 of title 13, CCR, that will supersede section 1956.8 starting with the 2027 MY for HDEs and would also apply to some medium-duty engines (MDE).

Subsection (c) “FTP cycle”

Purpose

The purpose of the proposed amendment to this definition is to allow 2026 MY MDEs certified on an engine dynamometer and hybrid powertrains certified on a powertrain dynamometer the option to use the Federal Test Procedure (FTP) cycle defined in 40 Code of Federal Regulations (CFR) 1036.512 entitled “Federal Test Procedure,” as that section existed on October 24, 2024, in lieu of the currently required FTP cycle defined in the engine dynamometer schedule in 40 CFR, Appendix I, Part 86, section (f)(1), entitled, “EPA Engine Dynamometer Schedule for Heavy-Duty Otto-Cycle Engines,” or section (f)(2), entitled, “EPA Engine Dynamometer Schedule for Heavy-Duty Diesel Engines,” as those sections existed on January 25, 2018. The proposed amendment would also require 2027 and subsequent MY MDEs certified on an engine dynamometer and hybrid powertrains certified on a powertrain dynamometer to use the FTP cycle defined in 40 CFR 1036.512 entitled “Federal Test Procedure,” as it existed on October 24, 2024. The proposed amendments would also change mentions of “CFR 40” to “40 CFR.”

Rationale

The proposed amendment is needed to align CARB on-board diagnostic (OBD) engine and hybrid powertrain durability demonstration engine (DDE) test procedures in the OBD II regulation with CARB tailpipe engine and hybrid powertrain durability demonstration emissions test procedures, which reference the new FTP cycle for the 2022 and subsequent MYs. The FTP cycle defined in 40 CFR 1036.512 can be used for engine testing alone on an engine dynamometer but was primarily created for manufacturers of hybrid powertrains to demonstrate emission benefits on a powertrain dynamometer that cannot be captured by testing an engine alone. The OBD regulation references emission standards and related test

procedures, and accordingly, the FTP cycle used for OBD testing should be the same as used for emission testing. Additionally, United States Environmental Protection Agency (U.S. EPA's) regulation (specifically 40 CFR 1036.150(x)) allows manufacturers the option to use the new FTP cycle defined in 40 CFR 1036.512 in MYs earlier than the 2027 MY, so CARB staff is proposing to add language to allow the use of the new FTP cycle in the 2026 MY to align with that option. The proposed amendments changing "CFR 40" to "40 CFR" is needed to be consistent with the use of "40 CFR" throughout the regulation.

Subsection (c) "Supplemental Emission Test (SET) cycle"

Purpose

The purpose of the proposed amendment to this definition is to allow 2026 MY MDEs certified on an engine dynamometer and hybrid powertrains certified on a powertrain dynamometer the option to use the SET cycle defined in 40 CFR 1036.510 entitled "Supplemental Emission Test" as that section existed on October 24, 2024 in lieu of the currently required SET cycle defined in 40 CFR 86.1360-2007, as amended July 13, 2005. The proposed amendment would also require 2027 and subsequent MY MDEs certified on an engine dynamometer and hybrid powertrains certified on a powertrain dynamometer to use the SET cycle defined in 40 CFR 1036.510 entitled "Supplemental Emission Test" as that section existed on October 24, 2024.

Rationale

The proposed amendment is needed to align CARB OBD engine and hybrid powertrain DDE test procedures in the OBD II regulation with CARB tailpipe engine and hybrid powertrain durability demonstration emissions test procedures, which reference the new SET cycle for the 2022 and subsequent MYs. The SET cycle defined in 40 CFR 1036.510 can be used for engine testing alone on an engine dynamometer but was primarily created for manufacturers of hybrid powertrains to demonstrate emission benefits on a powertrain dynamometer that cannot be captured by testing an engine alone. The OBD regulation references emission standards and related test procedures, and accordingly, the SET cycle used for OBD testing should be the same as used for emission testing. Additionally, U.S. EPA's regulation (specifically 40 CFR 1036.150(x)) allows manufacturers the option to use the new SET cycle defined in 40 CFR 1036.510 in MYs earlier than the 2027 MY, so staff is proposing to add language to allow the use of the new SET cycle in the 2026 MY to align with that option.

Subsections (d)(3.2.1)(G)(vi), (f) Table 3, (f)(9.2.1)(A)(ii), (h)(2.2.1), and (k)(7.3)

Purpose

The purpose of the proposed amendments to these subsections is to delay the start of the final minimum in-use monitor performance ratios (IUMPR) for the particulate matter (PM) filter filtering performance monitor and missing substrate monitor and the emission thresholds for the PM filter filtering performance monitor by three MYs. For the IUMPR requirements, the proposed amendments would accomplish this by delaying the interim IUMPRs so that vehicles required to meet a minimum IUMPR of 0.336 would meet this starting with the 2029 MY at the earliest instead of the currently required 2026 MY. For the PM filter filtering performance

monitor emission thresholds, the proposed amendments would change the applicability dates for the PM emission thresholds to align with the changes to the applicability dates for these IUMPRs. The proposed amendments to the applicable MYs for the PM filter monitor IUMPRs and PM emission thresholds (in milligrams per mile (mg/mi) or grams per brake horsepower-hour (g/bhp-hr)) are shown in Tables 1 to 3 below.

Table 1: Passenger cars, light-duty trucks, and medium-duty passenger vehicles (MDPV) certified to a chassis dynamometer tailpipe emission standard

Option	Current MYs	Proposed MYs	Minimum IUMPR	PM Emission Threshold
Option 1	2019-2021	2019-2021	0.100	17.50 mg/mi
	2022-2025	2022-2028	0.150	17.50 mg/mi
	2026-2028	2029-2031	0.336	17.50 mg/mi
	2029+	2032+	0.200	10.00 mg/mi
Option 2	2019-2021	2019-2021	0.100	17.50 mg/mi
	2022-2025	2022-2028	0.150	17.50 mg/mi
	2026-2028	2029-2031	0.150	10.00 mg/mi
	2029+	2032+	0.200	10.00 mg/mi

Table 2: Medium-duty vehicles (except MDPVs) certified to a chassis dynamometer tailpipe emission standard

Current MYs	Proposed MYs	Minimum IUMPR	PM Emission Threshold
2019-2021	2019-2021	0.100	1.50x PM standard or 17.50 mg/mi ¹
2022-2025	2022-2028	0.150	17.50 mg/mi
2026-2028	2029-2031	0.336	17.50 mg/mi
2029+	2032+	0.336	GVWR 8,500-10,000 lb: 14.00 mg/mi GVWR 10,001-14,000 lb: 17.5 mg/mi

Footnote 1: See Table 3 at beginning of subsection 1968.2(f) for applicable threshold.

Table 3: Medium-duty vehicles (including MDPVs) certified to an engine dynamometer tailpipe emission standard

Option	Current MYs	Proposed MYs	Minimum IUMPR	PM Emission Threshold
Option 1	2016-2018	2016-2018	0.100	0.03 g/bhp-hr
	2019-2025	2019-2028	0.300	0.03 g/bhp-hr
	2026-2028	2029-2031	0.336	0.03 g/bhp-hr
	2029+	2032+	0.200	0.02 g/bhp-hr
Option 2	2016-2018	2016-2018	0.100	0.03 g/bhp-hr
	2019-2025	2019-2028	0.300	0.03 g/bhp-hr
	2026-2028	2029-2031	0.150	0.02 g/bhp-hr
	2029+	2032+	0.200	0.02 g/bhp-hr

To align with these proposed amendments, changes are also proposed to the durability demonstration testing requirements in subsection 1968.2(h)(2.2.1) and the deficiency requirements in subsection 1968.2(k)(7.3). The purpose of the proposed amendments to subsection 1968.2(h)(2.2.1) is to change the MYs allowed to use the durability demonstration test vehicle selection requirements of this subsection from the 2026 through 2028 MY to the 2029 through 2031 MY. Further, the proposed amendments to subsection 1968.2(h)(2.2.1)(A) would change the MY of the test group example from the 2027 MY to the 2030 MY. The purpose of the proposed amendments to subsection 1968.2(k)(7.3) is to change the MYs allowed to use the deficiency allowances of this subsection from the 2026 through 2028 MY to the 2029 through 2031 MY. The proposed amendments to subsection 1968.2(k)(7.3.2) would also change the MY of the test group example from the 2027 MY to the 2030 MY.

Rationale

The proposed amendments to the subsections are needed to address manufacturers' concerns regarding the currently required minimum IUMPRs for the PM filter monitors. During the 2021 OBD rulemaking update (CARB, 2021), CARB staff revised the required IUMPRs and malfunction emission thresholds for the PM filter filtering performance monitor to address similar issues brought up by manufacturers regarding the final minimum required IUMPRs. During that rulemaking, CARB staff increased and extended the use of interim IUMPRs while concurrently lowering the emission thresholds at which the PM filter filtering performance monitors are required to detect malfunctions for most vehicles. PM filter monitors that are certified to these lower emission thresholds were allowed to meet lower ratios than the previously required final ratio of 0.336. This was intended to manage the balance between monitoring frequency and malfunction thresholds in order to continue progress towards achieving the final monitoring requirements and its associated emission benefits. Additionally, CARB staff had adopted relaxations to the durability demonstration testing requirements and deficiency requirements to accompany these changes, with different allowances based on which option the vehicle meets. However, manufacturers have since indicated that the resistive PM sensor technology currently being used for monitoring is incapable of robustly achieving these stringent requirements. They claimed that the electrostatic PM sensor technology would

be able to achieve them, but the sensors are not commercially available at this time and need further development. Therefore, the manufacturers have requested additional relief to these requirements to allow time for the electrostatic PM sensors to become commercially available. CARB staff agreed to this request and is proposing changes to the interim minimum required IUMPRs in order to delay the start of the final minimum required IUMPRs, with similar delays being proposed to the required emission thresholds in Table 3 of subsection 1968.2(f) and the PM filter monitor requirements in subsection 1968.2(f)(9.2.1)(A)(ii). The applicable MYs for the durability demonstration testing requirements in subsection 1968.2(h)(2.2.1) and the deficiency requirements in subsection 1968.2(k)(7.3) were also changed to align with these proposed amendments.

Subsection (d)(4.3.2)(P)

Purpose

The purpose of the proposed amendment to this subsection is to specify new requirements for incrementing the denominator for monitors that are part of a multiple NOx converting catalyst system such as monitors for the NOx catalysts, reductant injection system, and NOx sensors. The proposal would allow the manufacturer to increment the denominators for the NOx converting catalyst conversion efficiency monitor (subsection 1968.2(f)(2.2.2)), the reductant delivery monitor (subsection 1968.2(f)(2.2.3)(A)), the NOx sensor performance monitors (subsection 1968.2(f)(5.2.2)(A)), and the NOx sensor monitoring capability monitors (subsection 1968.2(f)(5.2.2)(D)) for these systems in accordance with the incrementing criteria in subsection 1968.2(d)(4.3.2)(G), with Executive Officer approval. Executive Officer approval would be based on the manufacturer demonstrating, using data or engineering analysis, that the enable conditions necessary for robust diagnostic decisions are unlikely to occur frequently enough to allow the monitors to comply with the minimum IUMPR requirements per subsections 1968.2(f)(2.3.1) and (f)(5.3.1)(A).

Rationale

The proposed amendment is needed to address manufacturers' concerns about potentially low monitoring frequency for components that are part of multiple NOx converting catalyst systems such as the NOx catalysts, reductant injection system, and NOx sensors. Specifically, manufacturers have argued that these systems, especially systems with NOx converting catalysts in series, result in one or more of the NOx catalysts not having enough NOx available in the exhaust for the conversion efficiency monitor to make a robust decision. For example, if the NOx converting catalyst is located downstream of another NOx converting catalyst, the NOx required for the conversion efficiency monitor to make a robust decision may only occur during periods of PM filter regeneration, which are infrequent and can take hundreds of minutes or miles between regeneration events. Additionally, some upstream NOx converting catalysts may only function during low load driving conditions, which also limit the opportunities for the conversion efficiency monitor to make a robust decision. CARB staff agrees that monitors that are part of a multiple NOx converting catalyst system may experience difficulty completing due to the limiting enable criteria that are needed to allow for a robust diagnostic decision. Similar challenges may exist for monitoring of the reductant injection system and NOx sensors. Accordingly, these specific monitors may need additional criteria to increment

the denominator to prevent expected low IUMPRs. Incrementing the denominator for these monitors according to subsection 1968.2(d)(4.3.2)(G), with Executive Officer approval, would address the concerns mentioned above.

Subsection (d)(4.5.5)

Purpose

The purpose of the proposed amendment to this subsection is to indicate that the numerator and denominator disablement requirements in this subsection would also apply to the criteria in subsection 1968.2(d)(4.3.2)(P).

Rationale

The proposed amendment is needed to account for the newly proposed denominator incrementing criteria in subsection 1968.2(d)(4.3.2)(P).

Subsection (d)(5.7.1)(B)

Purpose

The purpose of the proposed amendment to this subsection is to require additional conditions under which the incrementing of a mini-numerator, which is part of the supplemental monitor activity data (SMAD), must be paused. For 2031 and newer MY vehicles, if a pending fault code is stored that is associated with a malfunction that disables incrementing of the general denominator in accordance with subsection (d)(5.6.2)(C), the incrementing of all mini-numerators on all diagnostic or emission critical electronic powertrain control units (DEC-ECU) that track SMAD data would have to be paused. Incrementing of all paused mini-numerators on a DEC-ECU would have to resume on the next driving cycle in which no pending fault codes are stored on the DEC-ECU and no pending fault codes that can disable the incrementing of the general denominator are stored on any DEC-ECU. For 2027 through 2030 MY vehicles, manufacturers would have the option of complying with these proposed requirements or the current requirement.

Rationale

The proposed amendment is needed to help prevent inaccurate monitor activity ratio data. The proposed amendment would include new requirements for 2031 and newer MY vehicles on how to manage the pausing of mini-numerators when a stored fault code disables the incrementing of the general denominator. The regulation is already clear that the OBD II system must pause incrementing of a mini-numerator if the DEC-ECU that tracks the mini-numerator stores a pending fault code. However, the regulation is silent on what actions must be taken when the pending fault code is associated with a special class of malfunctions that disables incrementing of the general denominator, which is a parameter that impacts all SMAD tracking on all DEC-ECUs. An OBD II system can have more than one DEC-ECU engaged in SMAD tracking, and each would have its own mini-denominator that increments whenever the general denominator increments. If the incrementing of the general denominator is disabled by the storage of a pending fault code, all mini-denominators would be unable to increment. All of

the mini-numerators on the DEC-ECU that stored the pending fault code would be paused, but the mini-numerators on the other DEC-ECUs would continue to increment under the current regulation. This situation is best avoided because it would produce inaccurate monitor activity ratio data, which is the ratio of the mini-numerator to the mini-denominator. The proposed amendment would prevent this situation from occurring by ensuring that all mini-numerators pause in unison when incrementing of the general denominator is disabled by a pending fault code. The proposed amendment would also ensure that mini-numerators resume incrementing only when the pending fault code is no longer present. Because manufacturers may wish to implement these improved requirements on vehicles before the 2031 MY, staff proposes to give them the option of doing so for 2027 through 2030 MY vehicles.

Subsection (d)(5.7.2)(A)

Purpose

The purpose of the proposed amendment to this subsection is to limit the requirement of tracking and reporting a SMAD mini-denominator to only those DEC-ECUs that are capable of storing a pending fault code and that track and report mini-numerator data.

Rationale

The proposed amendment is needed to address issues with tracking SMAD data in all DEC-ECUs, especially those that do not store fault codes. Manufacturers employ different controller network architectures and assign the workload of managing diagnostic activity in different ways. In particular, some DEC-ECUs are configured to store fault codes while others are not. Since the regulation requires the mini-numerators and mini-denominator to pause when the associated DEC-ECU stores a pending fault code, it makes sense to limit the requirement of supporting a mini-denominator to only those DEC-ECUs that can store pending fault codes. Also, the regulation requires the OBD system to track and report a mini-numerator for each fault code that can illuminate the malfunction indicator light (MIL), but it does not specify precisely which DEC-ECUs must perform this function. Because it is not meaningful to support a mini-denominator in a DEC-ECU that the manufacturer does not use to track mini-numerators, CARB staff therefore proposes to further limit the requirement to support a mini-denominator to those DEC-ECUs that track and report mini-numerator data.

Subsections (e)(17.1.4)(B)(i)c., (f)(17.1.3)(B)(i), and (f)(17.1.3)(D)(i)

Purpose

The purpose of the proposed amendments to these subsections is to change the name of the test procedures from “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles” to “California Exhaust Emission Standards and Test Procedures for 2004 through 2026 Model Heavy-Duty Otto-Cycle Engines and Vehicles” and from “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles” to “California Exhaust Emission Standards and Test Procedures for 2004 through 2026 Model Heavy-Duty Diesel Engines and Vehicles.”

Rationale

The proposed amendments are needed to account for the newly proposed changes to the names of the test procedures.

Subsections (e)(17.1.4)(B)(iv) and (v), and (f)(17.1.3)(B)(iv) and (v)

Purpose

The purpose of the proposed additions of these subsections is to allow MD gasoline/spark-ignited and diesel/compression-ignition (CI) vehicles with engines certified to the proposed non-methane hydrocarbon (NMHC) and carbon monoxide (CO) emission standards applicable for 2027 and subsequent MYs to use alternate NMHC and CO malfunction criteria in lieu of the malfunction criteria described under each of the applicable monitoring requirements in section 1968.2. The alternate malfunction criteria would be based on using 0.140 g/bhp-hr as the applicable FTP NMHC standard, 15.5 g/bhp-hr as the applicable FTP CO standard for diesel engines, and 14.4 g/bhp-hr as the applicable FTP CO standard for gasoline engines.

Rationale

The proposed subsections are needed to provide modifications to the OBD malfunction criteria to accommodate the proposed lower FTP NMHC and CO standards for 2027 and subsequent MY MDVs certified to engine dynamometer tailpipe emission standards. Specifically, the proposed FTP NMHC standard will decrease from 0.140 g/bhp-hr to 0.060 g/bhp-hr while the proposed FTP CO standard will decrease from 15.5 g/bhp-hr (for diesel/CI engines) and 14.4 g/bhp-hr (for gasoline/Spark-Ignition (SI) engines) to 6.0 g/bhp-hr starting in the 2027 MY. Since the current OBD malfunction criteria are based on a multiple of the NMHC and CO emission standards the engine is certified to, the proposed lower FTP NMHC and CO standards would also require the OBD system to detect malfunctions at lower NMHC and CO emission levels. However, CARB staff have not yet fully evaluated the capability of OBD monitors to robustly detect failures at the lower emission levels. CARB staff had adopted higher alternate NO_x and PM malfunction criteria in subsections 1968.2(e)(17.1.4)(B) and 1968.2(f)(17.1.3)(B) during the Omnibus rulemaking (CARB, 2020) in 2020 to accommodate engines certified to the more stringent NO_x and PM emission standards that were concurrently adopted. CARB staff is therefore proposing similar changes to these subsections to account for engines certified to the proposed more stringent FTP NMHC and CO standards, having determined that a continuation of the current FTP NMHC and CO malfunction criteria is appropriate until CARB staff can evaluate the use of lower malfunction thresholds in a future OBD rulemaking update. Specifically, the proposed modifications to the malfunction criteria would require 2027 and subsequent MY vehicles with engines certified to an FTP NMHC standard of 0.140 g/bhp-hr or lower or certified to an FTP CO standard of 15.5 g/bhp-hr or lower for diesel/CI engines or 14.4 g/bhp-hr or lower for gasoline/SI engines to detect malfunctions at the same absolute emission levels as engines currently certified to the 0.140 g/bhp-hr FTP NMHC standard or 15.5 (for diesel/CI engines) or 14.4 (for gasoline/SI engines) g/bhp-hr FTP CO standard.

Subsections (e)(17.1.4)(C) and (f)(17.1.3)(C)

Purpose

The purpose of the proposed amendments to this subsection is to allow MD gasoline/SI and diesel/CI vehicles with engines certified to the proposed NMHC and CO emission standards applicable for 2027 and subsequent MYs to use alternate NMHC and CO malfunction criteria for the engine cooling system thermostat monitor in lieu of the malfunction criteria described under subsections 1968.2(e)(10.2.1)(A)(ii) and 1968.2(f)(11.2.1)(A)(ii). The alternate malfunction criteria would be based on using 0.140 g/bhp-hr as the applicable FTP NMHC standard, 15.5 g/bhp-hr as the applicable FTP CO standard for diesel engines, and 14.4 g/bhp-hr as the applicable FTP CO standard for gasoline engines. The purpose of the proposed amendments to subsections 1968.2(e)(17.1.4)(C)(i) and (ii) and 1968.2(f)(17.1.3)(C)(i) and (ii) is to indicate the applicable NOx or PM standard referenced is the applicable FTP NOx or PM standard.

Rationale

The proposed amendments are needed to provide modifications to the OBD malfunction criteria to accommodate the proposed lower FTP NMHC and CO standards for 2027 and subsequent MY engines. Subsections 1968.2(e)(10.2.1)(A)(ii) and 1968.2(f)(11.2.1)(A)(ii) allow manufacturers to lower the malfunction temperature threshold if the manufacturer demonstrates that fuel, sparking timing, and/or other coolant temperature-based modifications to the engine control strategies would not cause emissions to increase by 50% or more of the applicable standards. The proposed changes to subsections 1968.2(e)(17.1.4)(C) and 1968.2(f)(17.1.3)(C) would allow 2027 and subsequent MY MDVs with engines certified to an FTP NMHC standard of 0.140 g/bhp-hr or lower to use 0.140 g/bhp-hr for the applicable FTP NMHC standard and engines certified to an FTP CO standard of 15.5 g/bhp-hr or lower for diesel/CI engines or 14.4 g/bhp-hr or lower for gasoline/SI engines to use 15.5 g/bhp-hr for the applicable FTP CO standard for diesel/CI engines and 14.4 g/bhp-hr for the applicable FTP CO standard for gasoline/SI engines. The proposed applicable standards are the emission standards currently required for MDEs. Similar to the rationale behind the alternate relaxed malfunction thresholds proposed in subsections 1968.2(e)(7.1.4)(B) and 1968.2(f)(7.1.3)(B), CARB staff has not yet fully evaluated the capability of the thermostat monitors to robustly detect failures at lower emission levels, and will evaluate the use of lower standards for the thermostat monitor in a future OBD rulemaking update.

The proposed amendments to subsections 1968.2(e)(17.1.4)(C)(i) and (ii) and 1968.2(f)(17.1.3)(C)(i) and (ii) are needed to establish that the NOx and PM standards referenced are the FTP NOx and PM standards, which would align with the mentions of “FTP engine NOx standard” and “FTP engine PM standard” in the same subsections.

Subsections (e)(17.1.4)(D) and (f)(17.1.3)(D)(iv) and (v)

Purpose

The purpose of the proposed addition of these subsections is to allow MDVs with MDEs certified to the proposed FTP NMHC and CO emission standards applicable for 2027 and

subsequent MY engines to use alternate NMHC and CO test-out criteria in lieu of the test-out criteria described under subsections 1968.2(e)(11.2.3)(C), 1968.2(e)(15.1.2), 1968.2(f)(9.2.4)(A), 1968.2(f)(12.2.2)(B), and 1968.2(f)(15.2.2)(F)(ii). The alternate test-out criteria would be based on using 0.140 g/bhp-hr as the applicable FTP NMHC standard, 15.5 g/bhp-hr as the applicable FTP CO standard for diesel/CI engines, and 14.4 g/bhp-hr as the applicable FTP CO standard for gasoline/SI engines. Additionally, subsections 1968.2(e)(17.1.4)(D)(i) and (ii) would prescribe alternate NOx and PM test-out criteria for MD gasoline engines, basing the criteria on using 0.20 g/bhp-hr as the applicable FTP NOx standard and 0.01 g/bhp-hr as the applicable FTP PM standard.

Rationale

The proposed amendment is needed to provide modifications to the OBD test-out criteria for several monitors to accommodate the proposed lower FTP NMHC and CO standards for 2027 and subsequent MY engines. Similar to the rationale for the proposed amendments to subsections 1968.2(e)(17.1.4)(B) and 1968.2(f)(17.1.3)(B), since the current OBD test-out criteria are based on a multiple or percentage of the NMHC and CO emission standards the engine is certified to, the proposed lower NMHC and CO standards would require the OBD system to monitor components if malfunctions cause a smaller increase in emissions than previously required. Therefore, CARB staff is proposing that different standards be used to determine the test-out criteria for engines certified to these more stringent FTP NMHC or CO standards. Specifically, CARB staff is proposing to allow manufacturers to use the same FTP NMHC and CO standards (0.140 g/bhp-hr for the applicable FTP NMHC standard, 15.5 g/bhp-hr for the applicable FTP CO standard for diesel engines, and 14.4 g/bhp-hr for the applicable FTP CO standard for gasoline engines) as those proposed for the alternate malfunction criteria in 1968.2(e)(17.1.4)(B) and (C) and 1968.2(f)(17.1.3)(B) and (C). For example, a test-out criterion of “15% or more of the FTP NMHC standard” would now be “15% or more of a 0.140 g/bhp-hr FTP NMHC standard.” CARB staff had adopted similar provisions for the NOx and PM test-out criteria for diesel engines in subsection 1968.2(f)(17.1.3)(D) to accommodate the lower NOx and PM emission standards adopted during the Omnibus rulemaking update in 2020. CARB staff will evaluate the use of lower standards to apply to the “test-out” criteria in a future OBD rulemaking update.

Regarding the proposed alternate NOx and PM test-out criteria for MD gasoline engines in subsections 1968.2(e)(17.1.4)(D)(i) and (ii), due to oversight, CARB staff did not adopt these alternate test-out criteria for gasoline engines when it adopted the criteria for diesel engines during the 2020 Omnibus rulemaking update, even though there were test-out criteria based on NOx and PM for gasoline comprehensive component monitoring in subsection 1968.2(e)(15.1.2). Further, CARB staff adopted revised gasoline cold start emission reduction strategy (CSERS) monitoring requirements during the OBD 2021 rulemaking update that included test-out criteria based on the applicable standards the engine is certified to. Therefore, CARB staff is proposing alternate test-out criteria for MD gasoline engines that include alternate criteria related to the FTP engine NOx, PM, NMHC, and CO standards.

Subsection (f)(5.2.2)(D)

Purpose

The purpose of the proposed amendments to this subsection is to modify the requirements to consider a NOx sensor's monitoring capability monitor compliant. The amendment to subsection 1968.2(f)(5.2.2)(D)(i) would allow manufacturers to modify the spacing between data points if a data point(s) is calculated and placed into a region that would otherwise be tested by a separate NOx sensor failure mode and would require that all modified data points above or below the sensor malfunction threshold and between the NOx sensor malfunction thresholds for the two NOx sensor failure modes remain equally spaced from each other.

The proposal would add conditions to satisfy the compliance criteria in subsections 1968.2(f)(5.2.2)(D)(i)b., 1968.2(f)(5.2.2)(D)(i)c., and 1968.2(f)(5.2.2)(D)(i)e. Specifically, during testing for each data point in the passing region of the sensor monitor, which currently requires that the NOx sensor monitor currently being tested make a pass decision, the proposed changes would allow a fail decision from a NOx sensor monitor that is not currently being tested to meet the requirement. During testing for each data point in the passing region, which currently requires the dependent monitor to make a fail decision, the proposal would allow a fail decision from a NOx sensor monitor that is not currently being tested to meet the requirement. The proposed amendments would also require the dependent monitor to make a fail decision for at least one data point in the passing region of the sensor monitor.

The proposed amendments would include a new subsection 1968.2(f)(5.2.2)(D)(iii) to allow a fail decision by either the NOx sensor monitor or dependent monitor to satisfy the requirements of subsections 1968.2(f)(5.2.2)(D)(i)b. and 1968.2(f)(5.2.2)(D)(i)c. and require the manufacturer's service literature to document that the sensor or component/system for the dependent monitor may be malfunctioning. The proposed amendments would also include a new subsection 1968.2(f)(5.2.2)(D)(iv) to allow a manufacturer to submit additional equally-spaced data points in the passing region of the sensor monitor at different sensor performance levels if the data points fail to meet the requirements of subsection 1968.2(f)(5.2.2)(D)(i)e.

Finally, the proposed amendments include grammatical changes to the language in subsections 1968.2(f)(5.2.2)(D)(i)a. and 1968.2(f)(5.2.2)(D)(i)d., and the renumbering of current subsections 1968.2(f)(5.2.2)(D)(i)e., 1968.2(f)(5.2.2)(D)(i)f., 1968.2(f)(5.2.2)(D)(iii), and 1968.2(f)(5.2.2)(D)(iv).

Rationale

The proposed amendments are needed to address CARB staff's and manufacturers' various concerns regarding compliance of a NOx sensor's monitoring capability. These concerns range from interference between NOx sensor monitors, redundant testing due to statistical variation, NOx sensor false failures due to negative interactions with the performance of the component/system for the dependent monitor, and issues with effectively identifying and minimizing the gap in fault detection that may be present when a NOx sensor is near the malfunction threshold.

CARB staff agrees with manufacturers' concerns about monitor interference between NOx sensor monitors. Specifically, CARB staff agrees that multiple NOx sensor failure modes can converge and overlap during certain engine operating regions and failure mode isolation may not be possible, which can result in a fault being detected for a failure mode that is not currently being tested. The following three changes are being proposed to address this concern: (1) allow a separate NOx sensor monitor that is not currently being tested to make a fail decision in place of a pass decision by the NOx sensor monitor currently being tested, (2) allow a separate NOx sensor monitor that is not currently being tested to make a fail decision in place of a fail decision by the dependent monitor, and (3) permit a malfunction of a NOx sensor monitor that is not currently being tested to illuminate the MIL in place of the dependent component.

CARB staff agrees with manufacturers' concerns regarding redundant testing due to statistical variation and that large statistical variation may create redundant testing when data points from different sensor failure modes are calculated and placed into the same failure mode testing region. To address this, CARB staff is proposing to allow modification of data point(s) if the point(s) were calculated and placed into a region that will be tested by a different NOx sensor failure mode. This proposal would allow the data point spacing to be adjusted to move the data point(s) into the region of the NOx sensor failure mode that is currently being tested, while also requiring the spacing between data points to be equal. This will ensure that redundant testing is reduced and that the NOx sensor monitoring capability monitor is compliant.

CARB staff agrees with manufacturers' concerns regarding the potential for false failures of the NOx sensor due to negative interactions with the performance of the component/system for the dependent monitor (e.g., increased ammonia (NH₃) slip from a best performing unacceptable catalyst). CARB staff wants to account for this possibility during testing and is therefore proposing to allow for a fail decision by either the sensor monitor or the dependent monitor to meet the requirements of subsections 1968.2(f)(5.2.2)(D)(i)b. and 1968.2(f)(5.2.2)(D)(i)c. Additionally, CARB staff is proposing to require the manufacturers' document in service literature that the component/system for the dependent monitor or the sensor may be malfunctioning so that the repair technician will be aware to troubleshoot for both malfunctions should one of these faults be encountered in the field.

CARB staff is concerned about issues with effectively identifying and minimizing the gap in fault detection that may be present when a NOx sensor is near the malfunction threshold and a catalyst at its best performing unacceptable level is present in the system. To alleviate this concern, CARB staff is proposing to require the dependent monitor to make a fail decision either in the passing region of the sensor monitor or at the sensor monitor malfunction threshold for at least one data point, which will help better identify the location and size of the gap (if present). CARB staff is also proposing to allow manufacturers to submit additional data points in the regions mentioned above to demonstrate compliance if the current number of required data points is insufficient to meet the requirement. The additional data points and the previously tested data points would need to be equally spaced from each other to help accurately identify the location of a gap, if one is present.

Lastly, the proposed amendments to change the language and renumber subsections are needed to ensure that subsection 1968.2(f)(5.2.2)(D) is structured consistently and to account for the new subsections being proposed.

Subsection (f)(9.2.4)(A)(iii)

Purpose

The purpose of the proposed amendment to this subsection, which contains the NMHC conversion capability monitoring requirements for catalyzed PM filters, is to increase the maximum emissions increase limit for allowing manufacturers to test out of implementing this monitor from 15% to 30% of the applicable NMHC, NO_x (or non-methane organic gases (NMOG)+NO_x, if applicable), CO, or PM standard as measured from an applicable emission test cycle.

Rationale

The proposed amendment is needed to address manufacturers' concerns regarding meeting the currently required 15% test-out criteria as the emission standards become more stringent. Catalyzed PM filters that convert NMHC are currently exempt from NMHC conversion capability monitoring if both of the following criteria are satisfied: (1) no malfunction of the catalyzed PM filter's NMHC conversion capability can cause emissions to increase by 15% or more of the applicable NMHC, NO_x (or NMOG+NO_x, if applicable), CO, or PM standard as measured from an applicable emission test cycle; and (2) no malfunction of the catalyzed PM filter's NMHC conversion capability can cause emissions to exceed the applicable NMHC, NO_x (or NMOG+NO_x, if applicable), CO, or PM standard as measured from an applicable emission test cycle. As emission standards become more stringent, the 15% test-out criteria would require the OBD system to detect catalyzed PM filter malfunctions for smaller emission increases. As such, measuring for these smaller emission increases becomes more challenging for manufacturers, who provided emission test data showing the test-to-test emission measurement variation approaching the same levels as the test-out criteria. To address this difficulty, CARB staff is proposing to increase the test-out criteria for catalyzed PM filter's NMHC conversion capability monitoring from 15% to 30%.

Subsections (g)(4.1.1)(J) and (g)(4.1.2)(G)

Purpose

The purpose of the proposed subsections is to allow a monitor that increments the denominator using any of the criteria in sections 1968.2(d)(4.3.2)(C) through (J) and (L) through (P) to be considered to have "fully executed and determined that the component or system is not malfunctioning" (i.e., have met condition (1) described in sections (g)(4.1.1)(D) and (g)(4.1.2)(B)) when certain criteria are met. The criteria needed to be met consist of at least 15 warm-up cycles and at least 200 accumulated miles since the fault memory was last cleared, and no permanent fault code being stored for that monitor.

Rationale

The proposed amendments are needed to address manufacturers' concerns regarding monitors that do not execute frequently in-use. Specifically, manufacturers are concerned that for monitors that do not run frequently in-use (e.g., NO_x conversion efficiency monitors for a multiple selective catalytic reduction (SCR) catalyst system, PM filter regeneration monitors) due to needing specific operating conditions to enable the monitor for robust malfunction detection, the readiness status for the associated component/system readiness bit defined in sections (g)(4.1.1)(D) and (g)(4.1.2)(B) will have difficulty setting to "complete" in-use. This is due to the requirement of condition (1) from sections (g)(4.1.1)(D) and (g)(4.1.2)(B) that states that all respective supported monitors for a component/system readiness bit must fully execute and determine that the component or system is not malfunctioning in order for the readiness status for the component/system readiness bit to indicate "complete." If at least one of the respective supported monitors associated with a component/system readiness bit has not fully executed, then the readiness status will not indicate "complete." This may cause issues for the vehicle owner during vehicle Smog Check inspections, where the readiness status for the component/system readiness bits may be used to determine if a vehicle is ready for inspection.

The regulation currently allows specific monitors to utilize special denominators (i.e., denominators that increment when certain operating conditions are met beyond the conditions in subsection 1968.2(d)(4.3.2)(B) or (K)) when there are technical concerns with a monitor being able to run frequently in-use. When certain criteria are met, allowing a monitor associated with a component/system readiness bit to be considered to have "fully executed and determined that the component or system is not malfunctioning" would alleviate some of the concerns associated with meeting the conditions necessary for the readiness status for a component system readiness bit to indicate "complete." The proposed criteria of at least 15 warm-up cycles and 200 miles since the fault memory was last cleared were established based on similar criteria currently being used by the California Bureau of Automotive Repair (BAR) to deal with permanent fault codes during Smog Check inspections. Specifically, BAR ignores the presence of a permanent fault code in the OBD system if the vehicle has completed at least 15 warm-up cycles and has been driven at least 200 miles since the fault memory was last cleared. CARB staff believes these proposed criteria give the OBD system sufficient vehicle operation to detect most emissions-related faults. The proposal would also not allow a monitor to utilize this proposed allowance if a stored permanent fault code is present since there may be an emissions system malfunction present on the vehicle that would require repair.

Subsection (g)(4.2.3)(K)

Purpose

The purpose of this new subsection is to require 2031 and subsequent MY MDVs (including MDPVs) certified to an engine dynamometer tailpipe emission standard to make available the family certification level (FCL) for CO₂ (g/bhp-hr) and the highest value of rated power ("P_{max}") for all the configurations included in the engine family (specifically, the CO₂ FCL and P_{max} used by the OBD system to comply with the NO_x emission tracking requirements in subsection 1968.2(g)(6.12.3)(J)).

Rationale

The proposed subsection is needed to ensure that the OBD system makes available both the CO₂ FCL and Pmax values upon request to a generic scan tool. These values are important because they are used by the OBD system to calculate the normalized CO₂ mass which serves as the basis for the 2-bin moving average window (2B-MAW) binning decisions. Having access to these parameters would allow CARB staff to verify that the OBD system is correctly binning NOx data during in-use operation. The CO₂ FCL is particularly critical because it enables the conversion of tracked fuel consumption data into work, which in turn enables a NOx emission rate calculation to be done using 2B-MAW data.

Subsection (g)(6.12.2)

Purpose

The purpose of the proposed amendment to this subsection is to specify that the NOx emission tracking data stored by the OBD system must be based on signals that are sampled at a rate of at least one Hertz.

Rationale

The proposed amendment is needed to ensure that manufacturers implement the tracking of NOx emission data in a manner that is consistent with the original intention of this subsection. As described in the staff report for the 2018 OBD rulemaking (CARB, 2018), the data in each array are both (1) based on signals that are sampled at a rate of at least one Hertz and (2) are updated at a frequency of one Hertz. This first point was not explicitly captured in the original language of this subsection and is therefore now proposed to be added.

Subsection (g)(6.12.3)

Purpose

The purpose of the proposed amendment to this subsection is to add and refer to a table that shows which bins would be assigned to each array and each parameter associated with the NOx emission tracking requirements. The proposed amendment would also specify that the requirement to support the new bins "A" and "B" would only apply to medium-duty (MD) diesel engines certified to an engine dynamometer tailpipe emission standard. MD diesel engines certified to a chassis dynamometer tailpipe emission standard would be allowed to support bins "A" and "B" if both bins are set to zero at all times.

Rationale

The proposed amendment is needed to communicate to the manufacturer which bins would be supported for each NOx emission tracking parameter in each array. With the proposed addition of the 2B-MAW bins described in subsection 1968.2(g)(6.12.3)(J) (see the purpose and rationale for subsection 1968.2(g)(6.12.3)(J) below), the set of bins that the parameters would be required to support would no longer be uniform across all parameters. Indicating the differences in a table is a simple and effective way to communicate what would be required.

The proposed amendment is also needed to specify which engines must support the new 2B-MAW bins, namely MD diesel engines certified to an engine dynamometer tailpipe emission standard. These are the only engines covered by section 1968.2 for which the 2B-MAW in-use compliance (IUC) evaluation method applies, which is primarily intended for HDEs (title 13, CCR section 2139(c) requires MD diesel engines certified using HD procedures to abide by Heavy-duty in-use compliance (HDIUC) test procedures unless correlation factors which establish the relationship between engine and chassis testing are approved). The proposed amendment further indicates that MD diesel engines certified to a chassis dynamometer tailpipe emission standard would also be able to support the 2B-MAW bins if they are set to zero at all times. This provision would enable manufacturers to use standardized data structures for reporting NOx emission tracking data which include 2B-MAW bins while clearly indicating in a consistent fashion that the 2B-MAW IUC evaluation method does not apply to the engine.

Subsection (g)(6.12.3)(F)

Purpose

The purpose of the proposed amendment to this subsection is to sunset the use of Bin 15 in the NOx emission tracking requirements by requiring that the bin be set to zero at all times beginning with 2031 MY MD diesel engines certified on an engine dynamometer.

Rationale

The proposed amendment is needed to make the NOx emission tracking requirements consistent with the revised IUC testing requirements that apply to new diesel engines. Bin 15 stores data when the not-to-exceed (NTE) conditions associated with the legacy IUC testing protocol are satisfied. Beginning with the 2024 MY, engine dynamometer certified engines are no longer evaluated for IUC using the NTE method and are instead evaluated using the MAW method. The 2031 MY timeframe for implementation of this change would align with the timeframe for the more significant changes associated with adding 2B-MAW bins as described in the purpose and rationale for subsection 1968.2(g)(6.12.3)(J) below.

Subsection (g)(6.12.3)(G)

Purpose

The purpose of the proposed amendment to this subsection is to expand the types of regeneration events during which Bin 16 stores NOx tracking data. Originally, Bin 16 stored data only during active PM filter regeneration events. The proposed amendment would change this to any regeneration event starting with 2031 MY MD diesel engines and provides the examples of an active PM filter regeneration, catalyst desulfurization, and de-crystallization event.

Rationale

The proposed amendment is needed to ensure that an engine stores NOx emission tracking data during all forms of infrequent regeneration events, not just active PM filter regeneration

events. This change would align Bin 16 data with how emissions adjustment factors are determined at the time of certification. Adjustment factors must take into account both the frequency and emissions impact of all forms of infrequent regeneration events. The 2031 MY timeframe for implementation of this change would align with the timeframe for the more significant changes associated with adding 2B-MAW bins as described in the purpose and rationale for subsection 1968.2(g)(6.12.3)(J) below.

Subsection (g)(6.12.3)(J)

Purpose

The purpose of the proposed subsection is to add 2B-MAW bins to the NO_x emission tracking requirements and provide a basic overview of how the OBD system would store data in the new bins.

Rationale

Together with the proposed amendment described in the purpose and rationale for subsection 1968.2(g)(6.12.3)(F), the proposed subsection is needed to make the NO_x emission tracking requirements consistent with the 2B-MAW IUC testing requirements that apply to new diesel engines. The proposed new “Bin A” and “Bin B” would store data following the same 300-second moving window methodology used in 2B-MAW IUC testing. One difference, however, is that any window of data with less than 300 seconds of valid data at the end of a driving cycle would be discarded instead of carried over into the next driving cycle. This simplification relative to the official 2B-MAW method reduces the memory requirements for the engine control module.

Subsections (g)(6.12.3)(J)(i) and (g)(6.12.3)(J)(ii)

Purpose

The purpose of the proposed subsections is to define the new 2B-MAW bins, Bin A and Bin B, associated with the NO_x emission tracking requirements.

Rationale

The proposed subsections are needed to define the basic conditions under which Bin A and Bin B would store data. The OBD system would use the normalized CO₂ mass over a given 300-second window as the basis for determining into which bin the associated data would be stored. If the normalized CO₂ mass is 6% or less, the data would be stored in Bin A. If greater than 6%, the data would be stored in Bin B. This approach is consistent with that used by the IUC testing requirements that these engines are subject to.

Subsection (g)(6.12.3)(J)(iii)

Purpose

The purpose of the proposed subsection is to define how the normalized CO₂ mass, a key part of the 2B-MAW method, would be calculated by the OBD system.

Rationale

The proposed subsection is needed to establish a clear, standardized method for manufacturers to follow when designing their OBD systems to calculate the normalized CO₂ mass in the engine's exhaust during in-use operation. The normalized CO₂ mass is needed to enable the OBD system to determine which of the 2B-MAW bins must store a given 300-second window of data.

The proposed subsection would establish that the normalized CO₂ mass is equal to the total CO₂ mass over the 300-second window divided by the product of three terms: the FCL for CO₂ over the FTP duty cycle, the highest rated power in the engine family, and the duration of window (i.e., 300 seconds). The result of this calculation is a unitless number that the OBD system would use to sort the associated window data into the appropriate 2B-MAW bin. This approach is consistent with that used by the IUC testing requirements that these engines are subject to.

Subsection (g)(6.12.3)(J)(iv)

Purpose

The purpose of the proposed subsection is to define the conditions under which the OBD system would not include data into a window that is associated with 2B-MAW binning.

Rationale

The proposed subsection is needed to establish the conditions to be used by the OBD system for excluding data from a 300-second window. CARB staff proposes to use, as closely as possible, the conditions that are already established as part of the IUC testing requirements that these engines are subject to. Differences from those requirements are described below.

Although the proposed conditions and in-use testing requirements both exclude data from windows when the engine is off, the latter has an exemption for engines with tamper-resistant idle-reduction features. That exemption would admit data into a window during an engine stop-start event, for example. The proposed 2B-MAW bins for the OBD system, however, are limited to tailpipe NO_x mass, engine output energy (EOE), fuel consumption, and engine run time, all of which are zero during engine off conditions. Therefore, CARB staff proposes no exceptions to the engine off exclusion.

Unlike IUC testing requirements, the proposed conditions would exclude data when NO_x emission tracking is paused. The conditions which pause tracking, however, are well aligned with conditions that disqualify data for IUC testing. For example, the MIL is being commanded on due to fault codes associated with NO_x sensors or vehicle speed calculation inputs pauses NO_x emission tracking and would also be an acceptable reason for a manufacturer to disqualify an entire day's IUC test data. NO_x emission tracking is also paused if the engine stop lamp is commanded on, which would similarly be deemed appropriate to disqualify in-use test data. A key difference between NO_x emission tracking and IUC testing is that if a NO_x sensor is not actively reporting data, tracking of NO_x mass is paused but IUC testing is unaffected. NO_x sensor status is technically not a pause condition for NO_x emission tracking

as a whole because engine activity data continue to be tracked regardless of NOx sensor status, but this difference is nevertheless worth mentioning here for completeness.

Another difference between the proposed amendments and IUC testing is the quantity of data that is disqualified when a fault code appears. For NOx emission tracking, data are excluded for as long as the MIL is on or a pending fault code is present, but the maximum amount of historical data that can be excluded from the 2B-MAW bins when a fault code appears is the data stored in the 300-second buffer. This is because all other historical data are added into cumulative bins with both 100-hour and lifetime timeframes. Clearing such large amounts of data is not an appropriate response to a fault code. For IUC testing, the manufacturer may disqualify the entire day's test when a fault code is set, which is clearly more significant than a 300-second buffer. However, because NOx emission tracking data are used as a screening tool and not for direct compliance determination, this difference is not problematic.

The remaining differences relate to the elevation and ambient temperature exclusions associated with IUC testing. The elevation exclusion is vehicle operation above 5,500 feet above sea level, and the high ambient temperature exclusion is a function of elevation. While elevation data are readily available for portable emissions measurement system (PEMS)-based IUC testing, the same is not true for all engine control modules. As such, CARB staff proposes alternate exclusions that employ barometric pressure as a surrogate for elevation since barometric pressure is universally available to all engine control modules.

Subsection (g)(6.12.3)(J)(v)

Purpose

The purpose of the proposed subsection is to specify how the OBD system would handle intermingled periods of valid and excluded data when storing data in 300-second windows for 2B-MAW binning.

Rationale

The proposed subsection is needed to provide clear instructions to manufacturers on how to store data in windows for the 2B-MAW bins when there are periods of excluded data mixed among periods of valid data. CARB staff proposes to follow existing IUC requirements that direct the manufacturer to assemble 300-second windows from periods of valid data that are separated by periods of excluded data provided that no period of excluded data exceeds 599 seconds.

Subsection (g)(6.12.5)(B)(ii)

Purpose

The purpose of the proposed amendment is to expand the pause conditions for NOx tracking to include when the OBD system detects a NOx sensor malfunction and stores a pending fault code.

Rationale

The proposed amendment is needed to better ensure that the NOx data stored by the OBD system are accurate. The current requirement is that NOx tracking (also referred to as real emissions assessment logging (REAL) NOx tracking) must pause when a NOx sensor malfunction is detected and the MIL is commanded on for that malfunction. This is because a malfunctioning NOx sensor can output erroneous NOx concentration data that would result in inaccurate NOx mass data. MIL illumination typically requires two consecutive fail decisions by a NOx sensor diagnostic, where the first fail decision results in storage of a pending fault code. Although two consecutive fail decisions give greater certainty to the presence of a malfunction, a pending fault code is also likely associated with an actual malfunction and therefore indicates substantial risk of questionable NOx concentration data. CARB staff therefore proposes to require NOx tracking to pause when a pending fault code for a NOx sensor malfunction is stored.

Subsection (h)(2.3.2)

Purpose

The purpose of the proposed amendment is to require manufacturers of 2027 and subsequent MY MD diesel vehicles (including MDPVs) certified to an engine dynamometer tailpipe emission standard to use the accelerated aging procedures defined in subsection 1971.1(i)(2.3.5) for OBD durability demonstration testing. The proposed amendment would also allow manufacturers of 2026 MY MD diesel vehicles (including MDPVs) certified to an engine dynamometer tailpipe emission standard to use the accelerated aging procedures defined in subsection 1971.1(i)(2.3.5).

Rationale

The proposed amendment is needed to harmonize the OBD DDE accelerated aging protocol with the U.S. EPA tailpipe deterioration factor protocol in 40 CFR 1036.245. Refer to the purpose and rationale for subsection 1971.1(i)(2.3.5) below for additional details.

Subsection (i)(2.16)

Purpose

The purpose of the proposed amendment to this subsection is to require manufacturers to use CARB form Emissions Certification & Compliance Division (ECCD)/OBD-113 "OBD II Gasoline Monitoring Requirements Checklist," April 2024, for gasoline vehicles and ECCD /OBD-114 "OBD II Diesel Monitoring Requirements Checklist," May 2024, for diesel vehicles when submitting the monitoring requirements checklist as part of the certification documentation starting on January 1, 2027. The proposed amendments would also allow manufacturers to use these forms as part of the certification documentation before January 1, 2027.

Rationale

The proposed amendment is needed to ensure all manufacturers are using the same form for reporting of the fault codes for each malfunction criterion, which would ensure all the required

information are included and would help CARB staff efficiently review the certification documentation. The proposed CARB forms that are referenced in the subsection are revised versions of the original required forms (Attachments F and G of CARB Mail-Out #MSC 06-23, December 21, 2006), with the revisions made to correct errors and to account for amendments to the OBD II regulation that have been adopted since the original forms were first required.

Subsection (j)(1.5)

Purpose

The purpose of the proposed amendment to this subsection is to require manufacturers to use CARB form ECCD/OBD-129 “OBD II PVE J1 Template,” September 2023, to submit the report of results for testing under subsection 1968.2(j)(1) starting on January 1, 2027.

Rationale

The proposed amendment is needed to ensure all manufacturers are using the same form for reporting of the testing results, which would ensure all the required information are included and would help CARB staff efficiently review the report. Most manufacturers are currently already using this new form for submitting the required testing results.

Subsection (j)(2.4.1)

Purpose

The purpose of the proposed amendment to this subsection is to require manufacturers to use CARB form ECCD/OBD-130 “OBD II PVE J2 Template,” August 2023, to submit the report of results for testing under subsection 1968.2(j)(2) starting on January 1, 2027.

Rationale

The proposed amendment is needed to ensure all manufacturers are using the same form for reporting of the testing results, which would ensure all the required information are included and would help CARB staff efficiently review the report. Most manufacturers are currently already using this new form for submitting the required testing results.

Subsection (l)

Purpose

The purpose of the proposed amendment to this subsection is to change the website (<https://ww2.arb.ca.gov/certification-document-management-system>) that manufacturers may submit information to the Executive Officer through to an email address: eFILE@arb.ca.gov.

Rationale

The proposed amendment is needed to correct the submission information, since the website currently listed in the subsection will no longer exist in the future.

Section 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.

Subsections (c)(3)(A)(vii)

Purpose

The purpose of the proposed amendment to this subsection is to exclude the comprehensive component monitor readiness group from ordered mandatory recall and repair when the Executive Officer makes a finding of nonconformance with regards to the readiness status during enforcement testing.

Rationale

The proposed amendment is needed to address manufacturers' concerns regarding the challenges they face in the implementation of comprehensive component readiness bits for SAE International (SAE) J1979-2. Subsection 1968.5(c)(3)(A) of the OBD II enforcement regulation requires the Executive Officer to order a recall and repair of all vehicles in a motor vehicle class that have been determined to be equipped with a nonconforming OBD system if enforcement testing conducted pursuant to subsection 1968.5(b) or information received from the manufacturer indicates that valid and correct readiness status cannot be obtained. For vehicles using SAE J1979, the readiness status for the gasoline and diesel comprehensive components is required to always indicate "complete." However, for vehicles using SAE J1979-2, the readiness bit is required to indicate "complete" only under the circumstances described in subsection 1968.2(g)(4.1.2)(B). Manufacturers have expressed concerns about the infrequent conditions required for some of the comprehensive component monitors to run, making it difficult to set the overall readiness status to "complete." Therefore, some state inspection and maintenance (I/M) programs have indicated their plans to ignore the comprehensive component monitor readiness status for these vehicles during inspections, at least for the near term. Manufacturers have also argued that the comprehensive component readiness group is associated with a more significant number of monitors compared to other groups, which increases the potential for classification errors, and therefore should not be subject to mandatory recall if there are comprehensive component monitor readiness errors as these readiness bits will most likely be ignored during I/M. As such for 2030 and earlier MY vehicles that use SAE J1979-2, CARB staff is proposing to exclude the gasoline and diesel comprehensive component monitor readiness groups from the readiness groups that are considered in the mandatory recall criteria.

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

Subsection (a)

Purpose

The purpose of the proposed amendment to this subsection is to indicate that the HD applications described in this subsection refer to on-road HD applications.

Rationale

The proposed amendment is needed to address confusion about whether the HD OBD regulation section 1971.1 applied to off-road applications in addition to on-road applications. The proposed amendment would make clear that section 1971.1 does not apply to off-road applications.

Subsection (b)

Purpose

The purpose of the proposed amendments to this subsection is to indicate that the HDEs required to be equipped with OBD systems refer to engines used in on-road applications.

Rationale

The proposed amendments are needed to address confusion about whether section 1971.1 applied to off-road applications in addition to on-road applications.

Subsections (c) “Family Emission Limit (FEL),” “Federal Test Procedure (FTP) test,” “FTP standard,” “Heavy heavy-duty engine,” “Light heavy-duty engine,” “Medium heavy-duty engine,” and “SET standard,” (g)(3.1.1)(A), and (g)(3.2.1)(C)

Purpose

The purpose of the proposed amendments to these subsections is to indicate that the reference to title 13, CCR, section 1956.8.2, will be used instead of the reference to title 13, CCR, section 1956.8, if the former is applicable.

Rationale

The proposed amendments are needed to account for the newly proposed regulation section 1956.8.2 of title 13, CCR, that will supersede section 1956.8 starting with the 2027 MY for HDEs.

Subsection (c) “Federal Test Procedure (FTP) cycle”

Purpose

The purpose of the proposed amendment to this definition is to allow 2026 MY HDEs certified on an engine dynamometer and hybrid powertrains certified on a powertrain dynamometer the option to use the FTP cycle defined in 40 CFR 1036.512 entitled “Federal Test Procedure,” as that section existed on October 24, 2024, in lieu of the currently required FTP cycle defined in the engine dynamometer schedule in 40 CFR, Appendix I, Part 86, section (f)(1), entitled, “EPA Engine Dynamometer Schedule for Heavy-Duty Otto-Cycle Engines,” or section (f)(2), entitled, “EPA Engine Dynamometer Schedule for Heavy-Duty Diesel Engines,” as those sections existed on January 25, 2018. The proposed amendment would also require 2027 and subsequent MY HDEs certified on an engine dynamometer and hybrid powertrains certified on a powertrain dynamometer to use the FTP cycle defined in 40 CFR 1036.512 entitled “Federal Test Procedure,” as it existed on October 24, 2024.

Rationale

The proposed amendment is needed to align CARB OBD engine and hybrid powertrain DDE test procedures in the HD OBD regulation with CARB tailpipe engine and hybrid powertrain durability demonstration emissions test procedures, which reference the new FTP cycle for the 2022 and subsequent MYs. The FTP cycle defined in 40 CFR 1036.512 can be used for engine testing alone on an engine dynamometer but was primarily created for manufacturers of hybrid powertrains to demonstrate the emission benefits on a powertrain dynamometer that cannot be captured by testing an engine alone. The OBD regulation references emission standards and related test procedures, and accordingly, the FTP cycle used for OBD testing should be the same as used for emission testing. Additionally, U.S. EPA’s regulation (specifically 40 CFR 1036.150(x)) allows manufacturers the option to use the new FTP cycle defined in 40 CFR 1036.512 in MYs earlier than the 2027 MY, so CARB staff is proposing to add language to allow the use of the new FTP cycle in the 2026 MY to align with that option.

Subsection (c) “Heavy heavy-duty engine,” Light heavy-duty engine,” and “Medium heavy-duty engine”

Purpose

The purpose of the proposed amendments to these definitions is to change the title 13, CCR, section reference where these terminologies are defined from subsection 1956.8(i) to 1956.8(j).

Rationale

The proposed amendments are needed to correct errors in the section references.

Subsection (c) “non-methane hydrocarbon (NMHC)”

Purpose

The purpose of the proposed definition is to define NMHC as the definition of "hydrocarbon" in title 13, CCR, section 1956.8.2, for 2027 and subsequent MY engines.

Rationale

The proposed definition is needed to align the meaning of NMHC emissions and standards with those defined in the newly proposed section 1956.8.2 of title 13, CCR, which details the emission standards for 2027 and subsequent MY HDEs. This would align with the definitions/standards used by U.S. EPA in the federal regulations.

Subsections (c) “Smart device,” (d)(2.2.1)(D)(ii)d., (d)(2.2.1)(D)(ii)d.1., (d)(5.7), (d)(5.7.1)(B)(iii), (d)(5.7.2)(A), (d)(5.7.2)(B)(iii), (g)(3.2.1)(B)(ii), (h)(4.3.1)(B), (h)(4.3.2)(B), (h)(4.3.2)(C), (h)(4.6.1), (h)(4.6.3), (h)(4.7.2), (h)(4.10.2)(A), and (l)(1.4.3)(E)

Purpose

The purpose of the proposed amendments to these subsections is to change “diagnostic or emission critical electronic powertrain control unit,” “diagnostic or emission critical powertrain control unit,” “diagnostic or emission critical control unit,” and “diagnostic and emission critical electronic powertrain control unit” to “diagnostic or emission critical electronic control unit.”

Rationale

The proposed amendments are needed to match the terminology used in the definitions in subsection 1971.1(c) and to be consistent throughout the regulation.

Subsection (c) “Supplemental Emission Test (SET) cycle”

Purpose

The purpose of the proposed amendment to this definition is to allow 2026 MY HDEs certified on an engine dynamometer and hybrid powertrains certified on a powertrain dynamometer the option to use the SET cycle defined in 40 CFR 1036.510 entitled “Supplemental Emission Test” as that section existed on October 24, 2024 in lieu of the currently required SET cycle defined in 40 CFR 86.1360 as it existed on January 25, 2018. The proposed amendment would also require 2027 and subsequent MY HDEs certified on an engine dynamometer and hybrid powertrains certified on a powertrain dynamometer to use the SET cycle defined in 40 CFR 1036.510 entitled “Supplemental Emission Test” as that section existed on October 24, 2024.

Rationale

The proposed amendment is needed to align CARB OBD engine and hybrid powertrain DDE test procedures in the HD OBD regulation with CARB tailpipe engine and hybrid powertrain durability demonstration emissions test procedures, which reference the new SET cycle for the 2022 and subsequent MYs. The SET cycle defined in 40 CFR 1036.510 can be used for

engine testing alone on an engine dynamometer but was primarily created for manufacturers of hybrid powertrains to demonstrate the emission benefits on a powertrain dynamometer that cannot be captured by testing an engine alone. The OBD regulation references emission standards and related test procedures, and accordingly, the SET cycle used for OBD testing should be the same as used for emission testing. Additionally, U.S. EPA's regulation (specifically 40 CFR 1036.150(x)) allows manufacturers the option to use the new SET cycle defined in 40 CFR 1036.510 in MYs earlier than the 2027 MY, so CARB staff is proposing to add language to allow the use of the new SET cycle in the 2026 MY to align with that option.

Subsection (d)(4.3.2)(B)

Purpose

The purpose of the proposed amendment to this subsection is to indicate that the denominator incrementing requirements in this subsection would not apply to denominators for monitors meeting subsections 1971.1(d)(4.3.2)(C) through (P) instead of 1971.1(d)(4.3.2)(C) through (O).

Rationale

The proposed amendment is needed to account for the renumbering of current subsection 1971.1(d)(4.3.2)(O) to (P) since new denominator incrementing criteria were proposed in subsection 1971.1(d)(4.3.2)(O).

Subsection (d)(4.3.2)(O)

Purpose

The purpose of the proposed amendment to this subsection is to specify new requirements for incrementing the denominator for monitors that are part of a multiple NOx converting catalyst system such as monitors for the NOx catalysts, reductant injection system, and NOx sensors. The proposal would allow the manufacturer to increment the denominators for the NOx converting catalyst conversion efficiency monitor (subsection 1971.1(e)(6.2.1)), the reductant delivery monitor (subsection 1971.1(e)(6.2.2)(A)), the NOx sensor performance monitors (subsection 1971.1(e)(9.2.2)(A)), and the NOx sensor monitoring capability monitors (subsection 1971.1(e)(9.2.2)(D)) for these systems in accordance with the incrementing criteria in subsection 1971.1(d)(4.3.2)(G), with Executive Officer approval. Executive Officer approval would be based on the manufacturer demonstrating, using data or engineering analysis, that the enable conditions necessary for robust diagnostic decisions are unlikely to occur frequently enough to allow the monitors to comply with the minimum IUMPR requirements per subsections 1971.1(e)(6.3.1) and (e)(9.3.1)(A).

Rationale

The proposed amendment is needed to address manufacturers' concerns about potentially low monitoring frequency for components that are part of multiple NOx converting catalyst systems such as the NOx catalysts, reductant injection system, and NOx sensors. Specifically, manufacturers have argued that these systems, especially systems with NOx converting

catalysts in series, result in one or more of the NOx catalysts not having enough NOx available in the exhaust for the conversion efficiency monitor to make a robust decision. For example, if the NOx converting catalyst is located downstream of another NOx converting catalyst, the NOx required for the conversion efficiency monitor to make a robust decision may only occur during periods of PM filter regeneration, which are infrequent and can take hundreds of minutes or miles between regeneration events. Additionally, some upstream NOx converting catalysts may only function during low load driving conditions, which also limit the opportunities for the conversion efficiency monitor to make a robust decision. CARB staff agrees that monitors that are part of a multiple NOx converting catalyst system may experience difficulty completing due to the limiting enable criteria that are needed to allow for a robust diagnostic decision. Similar challenges may exist for monitoring of the reductant injection system and NOx sensors. Accordingly, these specific monitors may need additional criteria to increment the denominator to prevent expected low IUMPR s. Incrementing the denominator for these monitors according to subsection 1971.1(d)(4.3.2)(G), with Executive Officer approval, would address some of the concerns mentioned above.

Subsection (d)(4.3.2)(P)

Purpose

The purpose of the proposed amendment is to renumber this subsection from subsection 1971.1(d)(4.3.2)(O) to 1971.1(d)(4.3.2)(P). The proposed amendment to this subsection would also add the word “on” between “based” and “manufacturer data.”

Rationale

The proposed renumbering is needed since a new requirement for incrementing the denominator was added as subsection 1971.1(d)(4.3.2)(O). The proposed amendment to add the word “on” is needed to make the sentence read correctly.

Subsection (d)(4.5.4)

Purpose

The purpose of the proposed amendment to this subsection is to indicate that numerator and denominator disablement requirement in this subsection would also apply to the criteria in subsection 1971.1(d)(4.3.2)(O).

Rationale

The proposed amendment is needed to account for the newly proposed denominator incrementing criteria in subsection 1971.1(d)(4.3.2)(O).

Subsections (d)(5.1.2) and (d)(5.1.4)

Purpose

The purpose of the proposed amendments to these subsections, which describe the standardized specifications for the in-use monitor performance data, is to indicate that the

OBD system is required to separately report the in-use monitor numerator and denominator for the fuel system monitor on gasoline engines.

Rationale

The proposed amendments are needed to correct oversights. While subsections 1971.1(d)(3.2.1)(K) and 1971.1(f)(1.3.2) currently require the IUMPR data for the fuel system monitor on gasoline engines to be tracked and reported, subsections 1971.1(d)(5.1.2) and 1971.1(d)(5.1.4) mistakenly did not include mention of this monitor for the gasoline engines.

Subsections (d)(5.1.3) and (d)(5.1.4)

Purpose

The purpose of the proposed amendments to these subsections, which describe the standardized specifications for the in-use monitor performance data, is to indicate that the OBD system is required to separately report the in-use monitor numerator and denominator for the exhaust gas recirculation (EGR) system monitor from the variable valve timing, lift, and/or control (VVT) system monitor on gasoline and diesel engines using SAE J1979-2.

Rationale

The proposed amendments are needed to correct errors. The SAE J1979-2 standard requires separate in-use monitor performance numerators and denominators for the EGR system monitors and the VVT system monitors, while the SAE J1979 standard requires one set of numerators and denominators to represent both the EGR system monitors and VVT system monitors.

Subsection (d)(5.7.1)(B)

Purpose

The purpose of the proposed amendment to this subsection is to require additional conditions under which the incrementing of a mini-numerator, which is part of the SMAD data, must be paused. For 2031 and newer MY engines, if a pending fault code is stored that is associated with a malfunction that disables incrementing of the general denominator in accordance with subsection (d)(5.6.2)(C), the incrementing of all mini-numerators on all DEC-ECUs that track SMAD data would have to be paused. Incrementing of all paused mini-numerators on a DEC-ECU would have to resume on the next driving cycle in which no pending fault codes are stored on the DEC-ECU and no pending fault codes that can disable the incrementing of the general denominator are stored on any DEC-ECU. For 2027 through 2030 MY vehicles, manufacturers would have the option of complying with these proposed requirements or the current requirement.

Rationale

The proposed amendment is needed to help prevent inaccurate monitoring activity ratio data. The proposed amendment would include new requirements for 2031 and newer MY engines on how to manage the pausing of mini-numerators when a stored fault code disables the

incrementing of the general denominator. The regulation is already clear that the OBD system must pause incrementing of a mini-numerator if the DEC-ECU that tracks the mini-numerator stores a pending fault code. However, the regulation is silent on what actions must be taken when the pending fault code is associated with a special class of malfunctions that disables incrementing of the general denominator, which is a parameter that impacts all SMAD tracking on all DEC-ECUs. An OBD system can have more than one DEC-ECU engaged in SMAD tracking, and each would have its own mini-denominator that increments whenever the general denominator increments. If incrementing of the general denominator is disabled by the storage of a pending fault code, all mini-denominators would be unable to increment. All of the mini-numerators on the DEC-ECU that stored the pending fault code would be paused, but the mini-numerators on the other DEC-ECUs would continue to increment under the current regulation. This situation is best avoided because it would produce inaccurate monitor activity ratio data, which is the ratio of the mini-numerator to the mini-denominator. The proposed amendment would prevent this situation from occurring by ensuring that all mini-numerators pause in unison when incrementing of the general denominator is disabled by a pending fault code. The proposed amendment would also ensure that mini-numerators resume incrementing only when the pending fault code is no longer present. Because manufacturers may wish to implement these improved requirements on engines before the 2031 MY, CARB staff proposes to give them the option of doing so for 2027 through 2030 MY engines.

Subsection (d)(5.7.2)(A)

Purpose

The purpose of the proposed amendment to this subsection is to limit the requirement of tracking and reporting a SMAD mini-denominator to only those DEC-ECUs that are capable of storing a pending fault code and that track and report mini-numerator data.

Rationale

The proposed amendment is needed to address issues with tracking SMAD data in all DEC-ECUs, especially those that do not store fault codes. Manufacturers employ different controller network architectures and assign the workload of managing diagnostic activity in different ways. In particular, some DEC-ECUs are configured to store fault codes while others are not. Since the regulation requires the mini-numerators and mini-denominator to pause when the associated DEC-ECU stores a pending fault code, it makes sense to limit the requirement of supporting a mini-denominator to only those DEC-ECUs that can store pending fault codes. Also, the regulation requires the OBD system to track and report a mini-numerator for each fault code that can illuminate the MIL, but it does not specify precisely which DEC-ECUs must perform this function. Because it is not meaningful to support a mini-denominator in a DEC-ECU that the manufacturer does not use to track mini-numerators, CARB staff therefore proposes to further limit the requirement to support a mini-denominator to those DEC-ECUs that track and report mini-numerator data.

Subsections (e)(1.4.2)(D)(i)a. and (e)(2.4.2)(B)(i)a.

Purpose

The purpose of the proposed amendments to these subsections, which detail the freeze frame storage requirements for the diesel fuel system monitor and diesel misfire monitor, is to change “section (d)(2.2.1)(D)(iii)” to “section (d)(2.2.1)(D)(i)c.”

Rationale

The proposed amendments are needed to correct errors, since subsection 1971.1(d)(2.2.1)(D)(iii) does not exist.

Subsection (e)(6.2.3)(B)(ii)

Purpose

The purpose of the proposed amendment to this subsection, which details the catalyst system aging and monitoring requirements for the diesel NOx converting catalyst monitor, is to change “section (f)(6.2.3)(A)” to “section (e)(6.2.3)(A).”

Rationale

The proposed amendment is needed to correct an error, since this subsection describes the catalyst system aging requirements for the diesel NOx catalyst monitor in subsection 1971.1(e)(6), not the gasoline catalyst monitor in subsection 1971.1(f)(6), and since subsection 1971.1(f)(6.2.3)(A) does not exist.

Subsection (e)(7.2.6)(A)

Purpose

The purpose of the proposed amendment to this subsection is to delete the phrase “the manufacturer shall meet the following requirements.”

Rationale

The proposed amendment is needed to make the sentence read correctly.

Subsection (e)(7.3.1)(B)

Purpose

The purpose of the proposed amendment to this subsection, which describes the monitoring conditions requirements for the diesel NOx adsorber monitor, is to change “sections (e)(5.2.2) and (5.2.3)” to “section (e)(7.2.1).”

Rationale

The proposed amendment is needed to correct an error, since this subsection describes the monitoring conditions requirements for the diesel NO_x adsorber monitor in subsection 1971.1(e)(7), not the diesel NMHC converting catalyst monitor in subsection 1971.1(e)(5).

Subsection (e)(8.2.4)(A)(iii)

Purpose

The purpose of the proposed amendment to this subsection, which contains the NMHC conversion capability monitoring requirements for catalyzed PM filters, is to increase the maximum emissions increase limit for allowing manufacturers to test out of implementing this monitor from 15% to 30% of the applicable NMHC, NO_x, CO, or PM standard as measured from an applicable emission test cycle.

Rationale

The proposed amendment is needed to address manufacturers' concerns regarding meeting the currently required 15% test-out criteria as the emission standards become more stringent. Catalyzed PM filters that convert NMHC are currently exempt from NMHC conversion capability monitoring if both of the following criteria are satisfied: (1) no malfunction of the catalyzed PM filter's NMHC conversion capability can cause emissions to increase by 15% or more of the applicable NMHC, NO_x, CO, or PM standard as measured from an applicable emission test cycle; and (2) no malfunction of the catalyzed PM filter's NMHC conversion capability can cause emissions to exceed the applicable NMHC, NO_x, CO, or PM standard as measured from an applicable emission test cycle. As emission standards become more stringent, the 15% test-out criteria would require the OBD system to detect catalyzed PM filter malfunctions for smaller emission increases. As such, measuring for these smaller emission increases becomes more challenging for manufacturers, who provided emission test data showing the test-to-test emission measurement variation approaching the same levels as the test-out criteria. To address this difficulty, CARB staff is proposing to increase the test-out criteria for catalyzed PM filter's NMHC conversion capability monitoring from 15% to 30%.

Subsection (e)(9.2.2)(D)

Purpose

The purpose of the proposed amendments to this subsection is to modify the requirements to consider a NO_x sensor's monitoring capability monitor compliant. The amendment to subsection 1971.1(e)(9.2.2)(D)(i) would allow manufacturers to modify the spacing between data points if a data point(s) is calculated and placed into a region that would otherwise be tested by a separate NO_x sensor failure mode and would require that all modified data points above or below the sensor malfunction threshold and between the NO_x sensor malfunction thresholds for the two NO_x sensor failure modes remain equally spaced from each other.

The proposal would add conditions to satisfy the compliance criteria in subsections 1971.1(e)(9.2.2)(D)(i)b., 1971.1(e)(9.2.2)(D)(i)c., and 1971.1(e)(9.2.2)(D)(i)e. Specifically,

during testing for each data point in the passing region of the sensor monitor, which currently requires that the NOx sensor monitor currently being tested make a pass decision, the proposed changes would allow a fail decision from a NOx sensor monitor that is not currently being tested to meet the requirement. During testing for each data point in the passing region, which currently requires the dependent monitor to make a fail decision, the proposal would allow a fail decision from a NOx sensor monitor that is not currently being tested to meet the requirement. The proposed amendments would also require the dependent monitor to make a fail decision for at least one data point in the passing region of the sensor monitor.

The proposed amendments would include a new subsection 1971.1(e)(9.2.2)(D)(iii) to allow a fail decision by either the NOx sensor monitor or dependent monitor to satisfy the requirements of subsections 1971.1(e)(9.2.2)(D)(i)b. and 1971.1(e)(9.2.2)(D)(i)c. and require the manufacturer's service literature to document that the sensor or component/system for the dependent monitor may be malfunctioning. The proposed amendments would also include a new subsection 1971.1(e)(9.2.2)(D)(iv) to allow a manufacturer to submit additional equally-spaced data points in the passing region of the sensor monitor at different sensor performance levels if the data points fail to meet the requirements of subsection 1971.1(e)(9.2.2)(D)(i)e.

Finally, the proposed amendments include grammatical changes to the language in subsections 1971.1(e)(9.2.2)(D)(i)a. and 1971.1(e)(9.2.2)(D)(i)d., and the renumbering of current subsections 1971.1(e)(9.2.2)(D)(i)e., 1971.1(e)(9.2.2)(D)(i)f., 1971.1(e)(9.2.2)(D)(iii), and 1971.1(e)(9.2.2)(D)(iv).

Rationale

The proposed amendments are needed to address CARB staff's and manufacturers' various concerns regarding compliance of a NOx sensor's monitoring capability. These concerns range from interference between NOx sensor monitors, redundant testing due to statistical variation, NOx sensor false failures due to negative interactions with the performance of the component/system for the dependent monitor, and issues with effectively identifying and minimizing the gap in fault detection that may be present when a NOx sensor is near the malfunction threshold.

CARB staff agrees with manufacturers' concerns about monitor interference between NOx sensor monitors. Specifically, CARB staff agrees that multiple NOx sensor failure modes can converge and overlap during certain engine operating regions and failure mode isolation may not be possible, which can result in a fault being detected for a failure mode that is not currently being tested. The following three changes are being proposed to help reduce this concern: (1) allow a separate NOx sensor monitor that is not currently being tested to make a fail decision in place of a pass decision by the NOx sensor monitor currently being tested, (2) allow a separate NOx sensor monitor that is not currently being tested to make a fail decision in place of a fail decision by the dependent monitor, and (3) permit a malfunction of a NOx sensor monitor that is not currently being tested to illuminate the MIL in place of the dependent monitor.

CARB staff agrees with manufacturers' concerns regarding redundant testing due to statistical variation and that large statistical variation may create redundant testing when data points from

different sensor failure modes are calculated and placed into the same failure mode testing region. To address this, CARB staff is proposing to allow modification of data point(s) if the point(s) were calculated and placed into a region that will be tested by a different NOx sensor failure mode. This proposal would allow the data point spacing to be adjusted to move the data point(s) into the region of the NOx sensor failure mode that is currently being tested, while also requiring the spacing between data points to be equal. This will ensure that redundant testing is reduced and that the NOx sensor monitoring capability monitor is compliant.

CARB staff agrees with manufacturers' concerns regarding the potential for false failures of the NOx sensor due to negative interactions with the performance of the component/system for the dependent monitor (e.g., increased NH₃ slip from a best performing unacceptable catalyst). CARB staff wants to account for this possibility during testing and is therefore proposing to allow for a fail decision by either the sensor monitor or the dependent monitor to meet the requirements of subsections 1971.1(e)(9.2.2)(D)(i)b. and 1971.1(e)(9.2.2)(D)(i)c. Additionally, CARB staff is proposing to require the manufacturers' document in service literature that the component/system for the dependent monitor or the sensor may be malfunctioning so that the repair technician will be aware to troubleshoot for both malfunctions should one of these faults be encountered in the field.

CARB staff is concerned about issues with effectively identifying and minimizing the gap in fault detection that may be present when a NOx sensor is near the malfunction threshold and a catalyst at its best performing unacceptable level is present in the system. To alleviate this concern, CARB staff is proposing to require the dependent monitor to make a fail decision either in the passing region of the sensor monitor or at the sensor monitor malfunction threshold for at least one data point, which will help better identify the location and size of the gap (if present). CARB staff is also proposing to allow manufacturers to submit additional data points in the regions mentioned above to demonstrate compliance if the current number of required data points is insufficient to meet the requirement. The additional data points and the previously tested data points would need to be equally spaced from each other to help accurately identify the location of a gap, if one is present.

Lastly, the proposed amendments to change the language and renumber subsections are needed to ensure that subsection 1971.1(e)(9.2.2)(D) is structured consistently and to account for the new subsections being proposed.

Subsections (g)(5.2.1)(C), (g)(5.2.2)(B), (g)(5.2.4)(B), (i)(5.1.2)(A), and (i)(5.1.3)(A)

Purpose

The purpose of the proposed amendments to these subsections is to change the name of the test procedures from "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles" to "California Exhaust Emission Standards and Test Procedures for 2004 through 2026 Model Heavy-Duty Otto-Cycle Engines and Vehicles" and from "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" to "California Exhaust Emission Standards and Test Procedures for 2004 through 2026 Model Heavy-Duty Diesel Engines and Vehicles."

The proposed amendments to subsections 1971.1(e)(5.1.2)(A) and 1971.1(i)(5.1.3)(A) would also add reference to test procedure “California Exhaust Emission Standards and Test Procedures for 2027 and Subsequent Model Heavy-Duty Engines, Vehicles and Hybrid Powertrains,” as incorporated by reference in section 1956.8.2(c), title 13, CCR.

Rationale

The proposed amendments are needed to account for the newly proposed changes to the names of the current test procedures and the newly proposed test procedure that will apply to 2027 and subsequent MY HDEs.

Subsections (g)(5.2.1)(F), (g)(5.2.1)(G), (g)(5.2.2)(E), and (g)(5.2.2)(F)

Purpose

The purpose of the proposed additions of these subsections is to allow HD diesel/CI and gasoline/SI engines certified to the proposed FTP NMHC and CO emission standards applicable for 2027 and subsequent MY engines to use alternate NMHC and CO malfunction criteria in lieu of the malfunction criteria described under each of the applicable monitoring requirements in section 1971.1. The alternate malfunction criteria would be based on using 0.140 g/bhp-hr as the applicable FTP NMHC standard, 15.5 g/bhp-hr as the applicable FTP CO standard for diesel/CI engines, and 14.4 g/bhp-hr as the applicable FTP CO standard for gasoline/SI engines.

Rationale

The proposed subsections are needed to provide modifications to the OBD malfunction criteria to accommodate the proposed lower FTP NMHC and CO standards for 2027 and subsequent MY engines. Specifically, the proposed FTP NMHC standard will decrease from 0.140 g/bhp-hr to 0.060 g/bhp-hr while the proposed FTP CO standard will decrease from 15.5 g/bhp-hr (for diesel/CI engines) or 14.4 g/bhp-hr (for gasoline/SI engines) to 6.0 g/bhp-hr starting in the 2027 MY. Since the current OBD malfunction criteria are based on a multiple of the NMHC and CO emission standards the engine is certified to, the proposed lower FTP NMHC and CO standards would also require the OBD system to detect malfunctions at lower NMHC and CO emission levels. However, CARB staff have not yet fully evaluated the capability of OBD monitors to robustly detect failures at the lower emission levels. CARB staff had adopted higher alternate NOx and PM malfunction criteria in subsections 1971.1(g)(5.2.1) and (g)(5.2.2) during the Omnibus rulemaking in 2020 to accommodate engines certified to the more stringent NOx and PM emission standards that were concurrently adopted. CARB staff is therefore proposing similar changes to these subsections to account for engines certified to the proposed more stringent FTP NMHC and CO standards, having determined that a continuation of the current FTP NMHC and CO malfunction criteria is appropriate until CARB staff can evaluate the use of lower malfunction thresholds in a future OBD rulemaking update. Specifically, the proposed modifications to the malfunction criteria would require 2027 and subsequent MY engines certified to an FTP NMHC standard of 0.140 g/bhp-hr or lower, or certified to an FTP CO standard of 15.5 g/bhp-hr or lower for diesel/CI engines or 14.4 g/bhp-hr or lower for gasoline/SI engines to detect malfunctions at the same absolute emission levels as engines currently certified to the 0.140 g/bhp-hr FTP NMHC standard,

15.5 g/bhp-hr FTP CO standard for diesel/CI engines, or 14.4 g/bhp-hr FTP CO standard for gasoline/SI engines.

Subsection (g)(5.2.3)

Purpose

The purpose of the proposed amendments to this subsection is to allow HD diesel/CI and gasoline/SI engines certified to the proposed FTP NMHC and CO emission standards applicable for 2027 and subsequent MY engines to use alternate NMHC and CO malfunction criteria for the engine cooling system thermostat monitor in lieu of the malfunction criteria described under subsection 1971.1(g)(1.2.1)(A)(ii). The alternate malfunction criteria would be based on using 0.140 g/bhp-hr as the applicable FTP NMHC standard, 15.5 g/bhp-hr as the applicable FTP CO standard for diesel/CI engines, and 14.4 g/bhp-hr as the applicable FTP CO standard for gasoline/SI engines.

Rationale

The proposed amendments are needed to provide modifications to the OBD malfunction criteria to accommodate the proposed lower FTP NMHC and CO standards for 2027 and subsequent MY engines. Subsection 1971.1(g)(1.2.1)(A)(ii) allows manufacturers to lower the malfunction temperature threshold if the manufacturer demonstrates that fuel, sparking timing, and/or other coolant temperature-based modifications to the engine control strategies would not cause emissions to increase by 50% or more of the applicable standards. The proposed changes to subsection 1971.1(g)(5.2.3) would allow 2027 and subsequent MY engines certified to an FTP NMHC standard of 0.140 g/bhp-hr or lower to use 0.140 g/bhp-hr for the applicable FTP NMHC standard and engines certified to an FTP CO standard of 15.5 g/bhp-hr or lower for diesel/CI engines or 14.4 g/bhp-hr or lower for gasoline/SI engines to use 15.5 g/bhp-hr for the applicable FTP CO standard for diesel/CI engines and 14.4 g/bhp-hr for the applicable FTP CO standard for gasoline/SI engines. The proposed applicable standards are the emission standards currently required for HD diesel and gasoline engines. Similar to the rationale behind the alternate relaxed malfunction thresholds proposed in subsections 1971.1(g)(5.2.1) and (g)(5.2.2), CARB staff has not yet fully evaluated the capability of the thermostat monitors to robustly detect failures at lower emission levels, and will evaluate the use of lower standards for the thermostat monitor in a future OBD rulemaking update.

Subsections (g)(5.2.4)(E), (g)(5.2.4)(F), and (g)(5.2.5)

Purpose

The purpose of the proposed addition of these subsections is to allow HD diesel/CI and gasoline/SI engines certified to the proposed FTP NMHC and CO emission standards applicable for 2027 and subsequent MY engines to use alternate NMHC and CO test-out criteria in lieu of the test-out criteria described under subsections 1971.1(e)(3.2.6)(B), (e)(8.2.4)(A)(iii), (e)(11.2.2)(B), (f)(4.2.3)(C)(i), and (g)(3.2.2)(F)(ii). The alternate test-out criteria would be based on using 0.140 g/bhp-hr as the applicable FTP NMHC standard, 15.5 g/bhp-hr as the applicable FTP CO standard for diesel/CI engines, and 14.4 g/bhp-hr as the applicable FTP CO standard for gasoline/SI engines.

Rationale

The proposed amendment is needed to provide modifications to the OBD test-out criteria for several monitors to accommodate the proposed lower FTP NMHC and CO standards for 2027 and subsequent MY engines. Similar to the rationale for the proposed amendments to subsections 1971.1(g)(5.2.1) through (g)(5.2.3), since the current OBD test-out criteria are based on a multiple or percentage of the NMHC and CO emission standards the engine is certified to, the proposed lower NMHC and CO standards would require the OBD system to monitor components if malfunctions cause a smaller increase in emissions than previously required. Therefore, for engines certified to these more stringent FTP NMHC or CO standards, CARB staff is proposing changes to the applicable standards the test-out criteria would be based on. Specifically, CARB staff is proposing to allow manufacturers to use the same FTP NMHC and CO standards (0.140 g/bhp-hr for the applicable FTP NMHC standard, 15.5 g/bhp-hr for the applicable FTP CO standard for diesel engines, and 14.4 g/bhp-hr for the applicable FTP CO standard for gasoline engines) as those proposed for the alternate malfunction criteria in subsections 1971.1(g)(5.2.1) through (g)(5.2.3). For example, a test-out criterion of “15% or more of the FTP NMHC standard” would now be “15% or more of a 0.140 g/bhp-hr FTP NMHC standard.” CARB staff had adopted similar provisions for the NOx and PM test-out criteria in subsection 1971.1(g)(5.2.4) to accommodate the lower NOx and PM emission standards adopted during the Omnibus rulemaking update in 2020. CARB staff will evaluate the use of lower standards to apply to the test-out criteria in a future OBD rulemaking update.

Subsections (h)(4.1.1)(J) and (h)(4.1.2)(G)

Purpose

The purpose of the proposed subsections is to allow a monitor that increments the denominator using any of the criteria in sections 1971.1(d)(4.3.2)(C) through (I) and (K) through (O) to be considered to have “fully executed and determined that the component or system is not malfunctioning” (i.e., to have met condition (1) described in sections (h)(4.1.1)(D) and (h)(4.1.2)(B)) when certain criteria are met. The criteria needed to be met consist of at least 15 warm-up cycles and at least 400 accumulated minutes of engine run time since the fault memory was last cleared, and no permanent fault code being stored for that monitor.

Rationale

The proposed amendments are needed to address manufacturers' concerns regarding monitors that do not execute frequently in-use. Specifically, manufacturers are concerned that for monitors that do not run frequently in-use (e.g., NOx conversion efficiency monitors for a multiple SCR catalyst system, PM filter regeneration monitors) due to needing specific operating conditions to enable the monitor for robust malfunction detection, the readiness status for the associated component/system readiness bit defined in sections (h)(4.1.1)(D) and (h)(4.1.2)(B) will have difficulty setting to “complete” in-use. This is due to the requirement of condition (1) from sections (h)(4.1.1)(D) and (h)(4.1.2)(B) that states that all respective supported monitors for a component/system readiness bit must fully execute and determine that the component or system is not malfunctioning in order for the readiness status for the

component/system readiness bit to indicate “complete.” If at least one of the respective supported monitors associated with a component/system readiness bit has not fully executed, then the readiness status will not indicate “complete.” This may cause issues for the vehicle owner during vehicle inspections, where the readiness status for the component/system readiness bits may be used to determine if a vehicle is ready for inspection.

The regulation currently allows specific monitors to utilize special denominators (i.e., denominators that increment when certain operating conditions are met beyond the conditions in subsection 1971.1(d)(4.3.2)(B) or (J)) when there are technical concerns with a monitor being able to run frequently in-use. When certain criteria are met, allowing a monitor associated with a component/system readiness bit to be considered to have “fully executed and determined that the component or system is not malfunctioning” would alleviate some of the concerns associated with meeting the conditions necessary for the readiness status for a component system readiness bit to indicate “complete.” The proposed criteria were established based on similar criteria currently being used by the California BAR for gasoline light-duty (LD) vehicle, MDV, and HDV inspections regarding permanent fault codes. Specifically, BAR ignores the presence of a permanent fault code in the OBD system if the vehicle has completed at least 15 warm-up cycles and has been driven at least 200 miles since the fault memory was last cleared. CARB staff believes these criteria can also be used as the proposed criteria to set readiness to “complete” for diesel HDEs, with an engine run time of 400 minutes used as a criterion in place of 200 miles for engines not utilizing vehicle speed information, since this gives the OBD system sufficient vehicle operation to detect most emissions-related faults. The proposal would also not allow a monitor to utilize this proposed allowance if a stored permanent fault code is present since there may be an emissions system malfunction present on the vehicle that would require repair.

Subsection (h)(4.1.2)(B)(v)

Purpose

The purpose of the proposed amendments to this subsection, which lists the monitors required to be used to determine the status of the diesel NMHC converting catalyst readiness bit for engines using SAE J1979-2, is to require the monitor in subsection (e)(5.2.3)(A) to be used instead of the monitors in subsection (e)(5.2.3) starting with the 2031 MY. Further, the proposed amendments would allow 2023 through 2030 MY engines using SAE J1979-2 to use the monitors in subsections (e)(5.2.2) and (e)(5.2.3)(A) instead of subsections (e)(5.2.2) and (e)(5.2.3) to determine the diesel NMHC converting catalyst readiness status.

Rationale

The proposed amendments are needed to correct an error. Subsection 1971.1(h)(4.1.2)(B) lists the monitors that are required to be used to determine the status of each readiness bit for HDEs using SAE J1979-2. Subsection 1971.1(h)(4.1.2) was newly added to the regulation during CARB’s OBD rulemaking update in 2021, when CARB staff newly adopted requirements for implementation of SAE J1979-2. During that update, CARB staff intended to require the same diesel NMHC converting catalyst monitors for readiness status determination on HDEs using SAE J1979-2 as those currently required for HDEs using SAE J1979 or SAE

J1939, specifically the monitors in subsections 1971.1(e)(5.2.2) and (5.2.3)(A), with subsection 1971.1(e)(5.2.3)(A) specifying the monitor for catalyst exotherm generation used to assist PM filter regeneration. However, instead of stating subsection 1971.1(e)(5.2.3)(A) in the regulation language, CARB staff mistakenly stated subsection 1971.1(e)(5.2.3), which describes several other monitors related to the diesel NMHC converting catalyst aftertreatment assistance functions in addition to the catalyst exotherm generation monitor. Further, CARB staff concurrently made changes to the OBD II regulation during the 2021 OBD rulemaking update and adopted the correct monitors (title 13, CCR, subsection 1968.2(g)(4.1.2)(B)(xvi)) for the diesel NMHC converting catalyst readiness bit. Since manufacturers are aware an error had been made in section 1971.1 and prefer to include the one monitor in subsection 1971.1(e)(5.2.3)(A) instead of all the monitors in subsection 1971.1(e)(5.2.3), CARB staff proposed to require the monitor in subsection 1971.1(e)(5.2.3)(A) starting with the 2031 MY, but is allowing manufacturers to meet this amendment for earlier MY engines.

Subsection (h)(4.2.2)(D)

Purpose

The purpose of the proposed amendment to this subsection is to end the requirement for diesel engines to report the NO_x NTE control area status and PM NTE control area status data stream signals with the 2026 MY.

Rationale

The proposed amendment is needed to remove data stream requirements that are not relevant for 2027 and newer MY diesel engines. The NO_x and PM NTE control area status signals are associated with the NTE IUC evaluation method which will no longer be used for any engines beginning with the 2027 MY.

Subsection (h)(4.2.2)(J)

Purpose

The purpose of this new subsection is to require 2031 and subsequent MY engines to make available the FCL for CO₂ (g/bhp-hr) and the P_{max} for all the configurations included in the engine family (specifically, the CO₂ FCL and P_{max} used by the OBD system to comply with the NO_x emission tracking requirements in subsection 1971.1(h)(5.3.3)(J)).

Rationale

The proposed subsection is needed to ensure that the OBD system makes available both the CO₂ FCL and P_{max} values upon request to a generic scan tool. These values are important because they are used by the OBD system to calculate the normalized CO₂ mass which serves as the basis for the 2B-MAW binning decisions. Having access to these parameters would allow CARB staff to verify that the OBD system is correctly binning NO_x data during in-use operation. The CO₂ FCL is particularly critical because it enables the conversion of tracked fuel consumption data into work, which in turn enables a NO_x emission rate calculation to be done using 2B-MAW data.

Subsection (h)(4.2.2)(K)

Purpose

The purpose of the proposed amendment to this subsection is to renumber the subsection from (h)(4.2.2)(J) to (h)(4.2.2)(K).

Rationale

The proposed amendment is needed since new data stream requirements were proposed in subsection 1971.1(h)(4.2.2)(J), so the requirements currently in subsection 1971.1(h)(4.2.2)(J) were moved to new subsection 1971.1(h)(4.2.2)(K).

Subsections (h)(4.2.3)(H) and (I)

Purpose

The purpose of the proposed subsections is to require additional data stream signals to be reported for 2027 and subsequent MY HD diesel and gasoline engines.

Rationale

The proposed subsections are needed to harmonize with the data stream signals that the U.S. EPA is requiring for 2027 and subsequent MY HDEs in the federal OBD regulations, specifically 40 CFR sections 1036.110(b)(9) and (b)(10). U.S. EPA's HD OBD regulation (40 CFR section 1036.110) requires 2027 and subsequent MY HDEs to meet CARB's OBD requirements in title 13, CCR, section 1971.1 with a few differences, which include the additional data stream signals in 40 CFR sections 1036.110(b)(9) and (b)(10). Since HDE manufacturers generally design engines to meet both CARB and U.S. EPA requirements, engines sold in California would already be implementing these data stream signals even if they were not explicitly required in CARB's OBD regulations. However, for CARB to be able to ensure compliance with the new data stream requirements, they must be included in CARB's OBD regulations.

Subsection (h)(4.3.2)(A)

Purpose

The purpose of the proposed amendment to this subsection, which states the subsections in section 1971.1 that require freeze frame information to be stored, is to delete the reference to "(d)(2.2.2)(D)."

Rationale

The proposed amendment is needed to correct an error. Subsection 1971.1(h)(4.3.2) describes the freeze frame requirements for engine using SAE J1979-2. However, subsection 1971.1(h)(4.3.2)(A) mistakenly includes a reference to subsection 1971.1(d)(2.2.2)(D), which describes the freeze frame requirements for engines using SAE J1939, not SAE J1979-2, and is therefore not applicable to this subsection.

Subsection (h)(5.3.2)

Purpose

The purpose of the proposed amendment to this subsection is to specify that the NOx emission tracking data stored by the OBD system must be updated at a frequency of one Hertz.

Rationale

The proposed amendment is needed to ensure that manufacturers implement the tracking of NOx emission data in a manner that is consistent with the original intention of this subsection. As described in the staff report for the 2018 OBD rulemaking, the data in each array are both (1) based on signals that are sampled at a rate of at least one Hertz and (2) are updated at a frequency of one Hertz. This second point was not explicitly captured in the original language of this subsection and is therefore now proposed to be added.

Subsection (h)(5.3.3)

Purpose

The purpose of the proposed amendment to this subsection is to add and refer to a table that shows which bins would be assigned to each array and each parameter associated with the NOx emission tracking requirements.

Rationale

The proposed amendment is needed to communicate to the manufacturer which bins would be supported for each NOx tracking parameter in each array. With the proposed addition of the 2B-MAW bins described in subsection 1971.1(h)(5.3.3)(J) (see the purpose and rationale for subsection 1971.1(h)(5.3.3)(J) below), the set of bins that the parameters would be required to support would no longer be uniform across all parameters. Indicating the differences in a table is a simple and effective way to communicate what would be required.

Subsection (h)(5.3.3)(F)

Purpose

The purpose of the proposed amendment to this subsection is to sunset the use of Bin 15 in the NOx emission tracking requirements by requiring that the bin be set to zero at all times beginning with 2031 MY diesel engines.

Rationale

The proposed amendment is needed to make the NOx emission tracking requirements consistent with the revised IUC testing requirements that apply to new diesel engines. Bin 15 stores data when the NTE conditions associated with the legacy IUC testing protocol are satisfied. Beginning with the 2024 MY, engine dynamometer certified engines are no longer evaluated for IUC using the NTE method and are instead evaluated using the MAW method. The 2031 MY timeframe for implementation of this change would align with the timeframe for

the more significant changes associated with adding 2B-MAW bins as described in the purpose and rationale for subsection 1971.1(h)(5.3.3)(J) below.

Subsection (h)(5.3.3)(G)

Purpose

The purpose of the proposed amendment to this subsection is to expand the types of regeneration events during which Bin 16 stores NO_x emission tracking data. Originally, Bin 16 stored data only during active PM filter regeneration events. The proposed amendment would change this to any regeneration event starting with 2031 MY diesel engines and provides the examples of an active PM filter regeneration, catalyst desulfurization, and de-crystallization event.

Rationale

The proposed amendment is needed to ensure that an engine stores NO_x emission tracking data during all forms of infrequent regeneration events, not just active PM filter regeneration events. This change would align Bin 16 data with how emissions adjustment factors are determined at the time of certification. Adjustment factors must take into account both the frequency and emissions impacts of all forms of infrequent regeneration events. The 2031 MY timeframe for implementation of this change would align with the timeframe for the more significant changes associated with adding 2B-MAW bins as described in the purpose and rationale for subsection 1971.1(h)(5.3.3)(J) below.

Subsection (h)(5.3.3)(J)

Purpose

The purpose of the proposed subsection is to add 2B-MAW bins to the NO_x emission tracking requirements and provide a basic overview of how the OBD system would store data in the new bins.

Rationale

Together with the proposed amendment described in the purpose and rationale for subsection 1971.1(h)(5.3.3)(F), the proposed subsection 1971.1(h)(5.3.3)(J) is needed to make the NO_x emission tracking requirements consistent with the 2B-MAW IUC testing requirements that apply to new diesel engines. The proposed new “Bin A” and “Bin B” would store data following the same 300-second moving window methodology used in 2B-MAW IUC testing. One difference, however, is that any window of data with less than 300 seconds of valid data at the end of a driving cycle would be discarded instead of carried over into the next driving cycle. This simplification, relative to the official 2B-MAW method, reduces the memory requirements for the engine control module.

Subsections (h)(5.3.3)(J)(i) and (h)(5.3.3)(J)(ii)

Purpose

The purpose of the proposed subsections is to define the new 2B-MAW bins, Bin A and Bin B, associated with the NO_x emission tracking requirements.

Rationale

The proposed subsections are needed to define the basic conditions under which Bin A and Bin B would store data. The OBD system would use the normalized CO₂ mass over a given 300-second window as the basis for determining into which bin the associated data would be stored. If the normalized CO₂ mass is 6% or less, the data would be stored in Bin A. If greater than 6%, the data would be stored in Bin B. This approach is consistent with that used by the IUC testing requirements that these engines are subject to.

Subsection (h)(5.3.3)(J)(iii)

Purpose

The purpose of the proposed subsection is to define how the normalized CO₂ mass, a key part of the 2B-MAW method, would be calculated by the OBD system.

Rationale

The proposed subsection is needed to establish a clear, standardized method for manufacturers to follow when designing their OBD systems to calculate the normalized CO₂ mass in the engine's exhaust during in-use operation. The normalized CO₂ mass is needed to enable the OBD system to determine which of the 2B-MAW bins must store a given 300-second window of data.

The proposed subsection would establish that the normalized CO₂ mass is equal to the total CO₂ mass over the 300-second window divided by the product of three terms: the FCL for CO₂ over the FTP duty cycle, the highest rated power in the engine family, and the duration of the window (i.e., 300 seconds). The result of this calculation is a unitless number that the OBD system would use to sort the associated window data into the appropriate 2B-MAW bin. This approach is consistent with that used by the IUC testing requirements that these engines are subject to.

Subsection (h)(5.3.3)(J)(iv)

Purpose

The purpose of the proposed subsection is to define the conditions under which the OBD system would not include data into a window that is associated with 2B-MAW binning.

Rationale

The proposed subsection is needed to establish the conditions to be used by the OBD system for excluding data from a 300-second window. CARB staff proposes to use, as closely as

possible, the conditions that are already established as part of the IUC testing requirements that these engines are subject to. Differences from those requirements are described below.

Although the proposed conditions and in-use testing requirements both exclude data from windows when the engine is off, the latter has an exception for engines with tamper-resistant idle-reduction features. That exception would admit data into a window during an engine stop-start event, for example. The proposed 2B-MAW bins for the OBD system, however, are limited to tailpipe NO_x mass, EOE, fuel consumption, and engine run time, all of which are zero during engine off conditions. Therefore, CARB staff proposes no exceptions to the engine off exclusion.

Unlike IUC testing requirements, the proposed conditions would exclude data when NO_x emission tracking is paused. The conditions which pause tracking, however, are well aligned with conditions that disqualify data for IUC testing. For example, the MIL being commanded on due to fault codes associated with NO_x sensors or vehicle speed calculation inputs pauses NO_x emission tracking and would also be an acceptable reason for a manufacturer to disqualify an entire day's IUC test data. NO_x emission tracking is also paused if the engine stop lamp is commanded on, which would similarly be deemed appropriate to disqualify in-use test data. A key difference between NO_x emission tracking and IUC testing is that if a NO_x sensor is not actively reporting data, tracking of NO_x mass is paused but IUC testing is unaffected. NO_x sensor status is technically not a pause condition for NO_x emission tracking as a whole because engine activity data continue to be tracked regardless of NO_x sensor status, but this difference is nevertheless worth mentioning here for completeness.

Another difference between the proposed amendments and IUC testing is the quantity of data that is disqualified when a fault code appears. For NO_x emission tracking, data are excluded for as long as the MIL is on or a pending fault code is present, but the maximum amount of historical data that can be excluded from the 2B-MAW bins when a fault code appears is the data stored in the 300-second buffer. This is because all other historical data are added into cumulative bins with both 100-hour and lifetime timeframes. Clearing such large amounts of data is not an appropriate response to a fault code. For IUC testing, the manufacturer may disqualify the entire day's test when a fault code is set, which is clearly more significant than a 300-second buffer. However, because NO_x emission tracking data are used as a screening tool and not for direct compliance determination, this difference is not problematic.

The remaining differences relate to the elevation and ambient temperature exclusions associated with IUC testing. The elevation exclusion is vehicle operation above 5,500 feet above sea level, and the high ambient temperature exclusion is a function of elevation. While elevation data are readily available for PEMS-based IUC testing, the same is not true for all engine control modules. As such, CARB staff proposes alternate exclusions that employ barometric pressure as a surrogate for elevation since barometric pressure is universally available to all engine control modules.

Subsection (h)(5.3.3)(J)(v)

Purpose

The purpose of the proposed subsection is to specify how the OBD system would handle intermingled periods of valid and excluded data when storing data in 300-second windows for 2B-MAW binning.

Rationale

The proposed subsection is needed to provide clear instructions to manufacturers on how to store data in windows for the 2B-MAW bins when there are periods of excluded data mixed among periods of valid data. CARB staff proposes to follow existing IUC requirements that direct the manufacturer to assemble 300-second windows from periods of valid data that are separated by periods of excluded data provided that no period of excluded data exceeds 599 seconds.

Subsection (h)(5.3.6)(B)(ii)

Purpose

The purpose of the proposed amendment is to expand the pause conditions for NOx tracking to include when the OBD system detects a NOx sensor malfunction and stores a pending fault code.

Rationale

The proposed amendment is needed to better ensure that the NOx data stored by the OBD system are accurate. The current requirement is that REAL NOx tracking must pause when a NOx sensor malfunction is detected and the MIL is commanded on for that malfunction. This is because a malfunctioning NOx sensor can output erroneous NOx concentration data that would result in inaccurate NOx mass data. MIL illumination typically requires two consecutive fail decisions by a NOx sensor diagnostic, where the first fail decision results in storage of a pending fault code. Although two consecutive fail decisions give greater certainty to the presence of a malfunction, a pending fault code is also likely associated with an actual malfunction and therefore indicates substantial risk of questionable NOx concentration data. CARB staff therefore proposes to require NOx tracking to pause when a pending fault code for a NOx sensor malfunction is stored.

Subsection (h)(5.7.5)

Purpose

The purpose of the proposed amendment is to expand the pause conditions for tracking the parameters in subsections 1971.1(h)(5.4) through (5.6) to include when the OBD system detects a NOx sensor malfunction and stores a pending fault code.

Rationale

The proposed amendment is needed to harmonize the pause conditions for tracking the parameters in subsections 1971.1(h)(5.4) through (5.6) with the pause conditions associated with REAL NO_x tracking as described above in the rationale for the proposed amendment to subsection 1971.1(h)(5.3.6)(B)(ii). The tracking of parameters in subsections 1971.1(h)(5.4) through (5.6) is informally referred to as REAL GHG tracking. To be consistent with the original design of the regulation, REAL GHG tracking should be fully synchronized with REAL NO_x tracking, thus ensuring all of the tracked data cover the same periods of vehicle activity.

Subsection (h)(5.9)

Purpose

The purpose of the proposed amendments to this subsection, which describes the CSERS tracking requirements, is to modify a few equations and definitions. For subsection 1971.1(h)(5.9.1)(C), the equation for “brake engine torque” is modified from “(engine reference torque) x [indicated torque) – (friction torque)]” to “(engine reference torque) x [(% indicated torque) - (% friction torque)].” For subsection 1971.1(h)(5.9.1)(E), the equation for “heat energy flow prior to the SCR” is modified to allow manufacturers the option to use a value of zero for the “temperature difference between SCR inlet and ambient” in the case where the ambient temperature is greater than the SCR inlet temperature.” For subsection 1971.1(h)(5.9.3)(B), the phrase “(i.e., the current driving cycle data described in section (h)(5.9.4)(A))” is deleted from the definition of Y(t). Finally, for subsection 1971.1(h)(5.9.4), the subsection reference “(g)(5.9.3)(A)” is changed to “(h)(5.9.3)(A).”

Rationale

The proposed amendments are needed to correct errors and simplify requirements. Subsection 1971.1(h)(5.9.1) defines the terms used in subsection 1971.1(h)(5.9), which describes the CSERS tracking requirements. The proposed amendments to add the % symbols to the indicated torque and friction torque values in the definition of “brake engine torque” are needed to correct the numerical values required to be used for torque. The proposed amendments to the equation for “heat energy flow prior to the SCR” in subsection 1971.1(h)(5.9.1)(E) are needed to allow the manufacturer to avoid a negative value in the rare case where the SCR ambient temperature is greater than the SCR inlet temperature during a cold start, since it is inappropriate to track this as positive heat created by the engine. The proposed deletion in the definition of Y(t) in subsection 1971.1(h)(5.9.3)(B) is needed to more accurately reflect how to define Y(t). The proposed amendment in subsection 1971.1(h)(5.9.4) is needed to correct an error, since subsection 1971.1(h)(5.9.3)(A) is the correct reference and subsection 1971.1(g)(5.9.3)(A) does not exist.

Subsection (h)(7.2.2)

Purpose

The purpose of the proposed amendment to this subsection is to change “the standardization requirements of section (g)” to “the standardization requirements of section (h).”

Rationale

The proposed amendment is needed to correct an error, since the standardization requirements are contained in subsection 1971.1(h), while subsection 1971.1(g) contains the monitoring requirements for all engines.

Subsection (i)(2.3.4)

Purpose

The purpose of the proposed amendment is to limit the DDE aging and data collection requirements under this subsection to the 2024 through 2026 MYs.

Rationale

The proposed amendment is needed since new aging and data collection requirements are being proposed for 2027 and subsequent MY test engines in subsection 1971.1(i)(2.3.5).

Subsection (i)(2.3.4)(C)

Purpose

The purpose of the proposed subsection is to allow manufacturers the option to meet the newly proposed DDE aging and data collection requirements in subsection 1971.1(i)(2.3.5) for 2026 MY test engines.

Rationale

The proposed subsection is needed to address manufacturers' request to implement the new DDE aging protocols defined in 40 CFR 1036.245 earlier than the 2027 MY. Additionally, U.S. EPA's regulation allows manufacturers the option to use the new accelerated aging procedure defined in 40 CFR 1036.245 in MYs earlier than the 2027 MY, so CARB staff is proposing to add language to allow the use of the new accelerated aging procedure in the 2026 MY to align with that option.

Subsection (i)(2.3.5)

Purpose

The purpose of the proposed subsection is to allow manufacturers of 2027 and subsequent MY test engines the option to use either the currently required accelerated aging procedure and data collection requirements in subsection 1971.1(i)(2.3.4)(A) and (B) or the accelerated aging procedure specified in 40 CFR 1036.245 and the data collection requirements provided in subsection 1971.1(i)(2.3.5)(B) for DDE testing. The proposed subsection would also allow manufacturers the option to collect data from an engine, engine emission controls, and aftertreatment system used for manufacturer self-testing (MST) under subsection 1971.5(c) to validate its accelerated aging process in lieu of an actual high-mileage system meeting the mileage requirements in subsection 1971.1(i)(2.3.4)(A). The proposed subsection also specifies that the manufacturer would be required to submit a plan only for the data collection if

an MST engine is used, as opposed to a plan for the system selection, procurement, and data collection.

For the required DDE testing in subsection 1971.1(i)(3) for manufacturers that choose to use the procedures in 40 CFR 1036.245, proposed section 1971.1(i)(2.3.5)(B)(i) would require the manufacturer to use a system consisting of the engine, engine emission controls, and aftertreatment that have been accelerated aged using the procedure in 40 CFR 1036.245 with the specific requirement that the 40 CFR 1065.1131 through 1065.1145 procedures be used for bench aging of the aftertreatment system. Injectors (e.g., diesel exhaust fluid (DEF), hydrocarbon), aftertreatment monitoring sensors, and aftertreatment control sensors would be required to be aged using the procedures referenced in 40 CFR 1036.245, including the bench aging procedures defined in 40 CFR 1065.1131 through 1065.1145.

For engines aged using the accelerated aging procedure in 40 CFR 1036.245, the proposed aging data correlation requirements in subsection 1971.1(i)(2.3.5)(B)(ii) would require the manufacturer to submit data that include a comparison between a representative full UL system and the accelerated aged engine of any and all adaption/learning parameters associated with feedback or feed-forward control parameters for the fuel system, EGR system, boost control system, and DEF dosing system. Subsection 1971.1(i)(2.3.5)(B)(ii)a. would also specify that these adaption/learning parameters data will not be used as criteria for approving the use of the accelerated aging protocol specified in subsection 1971.1(i)(2.3.5)(B). These submitted data would be in addition to the emission, deterioration, and performance data that are also required to be collected and submitted.

Lastly, the proposed subsection (i)(2.3.5)(C) would allow the Executive Officer to waive the requirement for the submittal of the plan and data for an engine if they have been submitted for a previous MY, the aging method has not changed from the previous MY, and the calibrations and hardware of the test engine have not changed to the extent that aging mechanisms are affected from the previous MY.

Rationale

The proposed subsection is needed to allow manufacturers the option to harmonize the OBD DDE accelerated aging protocol with the U.S. EPA tailpipe deterioration factor protocol in 40 CFR 1036.245. Manufacturers have stated this allowance would improve testing efficiency and streamline the use of testing resources in light of the increased full UL mileage requirements that take effect for 2027 and subsequent MYs under 40 CFR 1036.104. By allowing manufacturers to use this standardized aging protocol, CARB staff would be able to better ensure consistency of each manufacturer's accelerated aging process.

The proposed amendment allowing the use of systems used for MST is needed to provide relief to manufacturers by allowing an alternative system, acquired from MST, to validate its accelerated aging process instead of procuring an actual high-mileage system that has a minimum actual mileage of full UL. By allowing this relief, it is anticipated that much of the required emission, deterioration, and performance data can be collected during MST, which will relieve the manufacturer of conducting a separate test program specifically to validate its accelerated aging process. If the manufacturer uses an MST engine for this correlation requirement, then the manufacturer would not need to propose a plan for system selection and

procurement since the manufacturer selects and procures an MST engine based on the requirements in subsection 1971.5(c).

The proposal requiring that DDE testing be conducted using a system consisting of the engine, engine emission controls, and aftertreatment is intended to ensure that OBD demonstration data better represent the actual performance of aged engines and aftertreatment systems in the field. CARB staff is proposing that aftertreatment bench aging be conducted on the injectors, aftertreatment monitoring sensors, and aftertreatment control sensors using the procedures in 40 CFR 1065.1131 through 1065.1145 to ensure that these specific components are subjected to complete accelerated aging as well to better represent actual aged system performance in the field.

Additionally, the proposal would require the manufacturer to submit a comparison of adaptation/learning parameters of a representative full UL system to the accelerated aged test engine that was aged using the accelerated aging procedure specified in 40 CFR 1036.245, in addition to emission, deterioration and performance data. CARB staff proposes limiting data collection of adaption/learning parameters to those associated with the feedback or feed-forward control systems of major emissions systems that can have a major impact on emissions and would be expected to adapt over the life of the engine. The fuel system, EGR system, boost control system, and DEF dosing system are the major emissions systems that are expected to have a significant impact on emissions when malfunctioning and are also expected to adapt over the life of the engine. CARB staff intends to use these data to internally track and compare field aged versus accelerated aged engines and will not use these data to approve or reject the use of the accelerated aging protocol specified in 40 CFR 1036.245 for OBD DDE testing. CARB staff is taking this approach because this aging protocol is standardized and has been approved for use in deterioration factor aging by both U.S. EPA and CARB for emissions testing for 2026 and subsequent MY test engines.

Finally, the provision allowing manufacturers to waive the submittal of the plan and data for similar engines that were previously tested is needed to provide relief to manufacturers, since CARB staff does not consider it necessary for manufacturers to repeat this data correlation effort if the data have been previously submitted for an engine and aftertreatment design that has not changed materially from previous MYs.

Subsection (j)(2.17)

Purpose

The purpose of the proposed amendment to this subsection is to require manufacturers to use CARB form ECCD/OBD-119 “HD OBD Diesel Monitoring Requirements Checklist,” July 2024, for diesel engines and ECCD/OBD-118 “HD OBD Gasoline Monitoring Requirements Checklist,” July 2024, for gasoline engines when submitting the monitoring requirements checklist as part of the certification documentation starting on January 1, 2027. The proposed amendments would also allow manufacturers to use these forms before January 1, 2027.

Rationale

The proposed amendment is needed to ensure all manufacturers are using the same form for reporting of the fault codes for each malfunction criteria, which would ensure all the required information are included and would help CARB staff efficiently review the report. The proposed CARB forms that are referenced in the subsection are revised versions of the original required forms (Attachments G and H of ARB Mail-Out #MSC 09-22, July 7, 2009), with the revisions made to account for amendments to the HD OBD regulation that have been adopted since the original forms were first required.

Subsection (k)(3.2.1)

Purpose

The purpose of the amendments to this subsection is to renumber Table 1 to Table 2.

Rationale

The proposed amendments are needed since CARB staff is proposing to add a new table in a preceding subsection (subsection 1971.1(h)(5.3.3)).

Subsection (l)(1.5.1)

Purpose

The purpose of the proposed amendment to this subsection is to require manufacturers to use CARB form ECCD/OBD-127 "HD OBD PEVE L1 Template," September 2023, to submit the report of results for the testing under subsection 1971.1(l)(1) starting on January 1, 2027.

Rationale

The proposed amendment is needed to ensure all manufacturers are using the same form for reporting of the test results, which would ensure all the required information are included and would help CARB staff efficiently review the report. Most manufacturers are currently already using this new form for submitting the required testing results.

Subsection (l)(2.4.1)

Purpose

The purpose of the proposed amendment to this subsection is to require manufacturers to use CARB form ECCD/OBD-128 "HD OBD PEVE L2 Template," August 2023, to submit the report of results for the testing under subsection 1971.1(l)(2) starting on January 1, 2027.

Rationale

The proposed amendment is needed to ensure all manufacturers are using the same form for reporting of the test results, which would ensure all the required information are included and would help CARB staff efficiently review the report. Most manufacturers are currently already using this new form for submitting the required testing results.

Subsection (n)**Purpose**

The purpose of the proposed amendment to this subsection is to change the website (<https://ww2.arb.ca.gov/certification-document-management-system>) that manufacturers may submit information to the Executive Officer through to an email address: eFILE@arb.ca.gov.

Rationale

The proposed amendment is needed to correct the submission information, since the website currently listed in the subsection will no longer exist in the future.

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

Subsections (a)(3) “Heavy Heavy-Duty Engine,” “Light Heavy-Duty Engine,” and “Medium Heavy-Duty Engine,” and (b)(4)(B)(i)

Purpose

The purpose of the proposed amendments to these subsections is to indicate that the reference to title 13, CCR, section 1956.8.2, will be used instead of the reference to title 13, CCR, section 1956.8.2, if the former is applicable.

Rationale

The proposed amendments are needed to account for the newly proposed regulation section 1956.8.2 of title 13, CCR, that will supersede section 1956.8 starting with the 2027 MY for HDEs.

Subsection (a)(3) “Heavy Heavy-Duty Engine”

Purpose

The purpose of the proposed amendment is to add a definition for a “heavy heavy-duty engine,” which indicates it is defined in title 13, CCR, subsection 1956.8(j).

Rationale

The proposed definition is needed to set forth what 2027 and subsequent MY engines qualify as a heavy HDE because a newly proposed subsection (subsection 1971.5(c)(2)(C)(i)c.1.) specifies new required minimum full useful mileage for these engines for MST. Title 13, CCR, subsection 1956.8(j) defines this as an engine that is normally used in vehicles with a gross weight exceeding 33,000 lb.

Subsection (a)(3) “Light Heavy-Duty Engine”

Purpose

The purpose of the proposed amendment is to add a definition for a “light heavy-duty engine,” which indicates it is defined in title 13, CCR, subsection 1956.8(j).

Rationale

The proposed definition is needed to set forth what 2027 and subsequent MY engines qualify as a light HDE because a newly proposed subsection (subsection 1971.5(c)(2)(C)(i)c.3.) specifies new required minimum full useful mileage for these engines for MST. Title 13, CCR, subsection 1956.8(j) defines this as an engine that is normally used in vehicles with a gross weight below 19,500 lb.

Subsection (a)(3) “Medium Heavy-Duty Engine”

Purpose

The purpose of the proposed amendment is to add a definition for a “medium heavy-duty engine,” which indicates it is defined in title 13, CCR, subsection 1956.8(j).

Rationale

The proposed definition is needed to set forth what 2027 and subsequent MY engines qualify as a medium HDE because a newly proposed subsection (subsection 1971.5 (c)(2)(C)(i)c.2.) specifies the new required minimum full useful mileage for these engines for MST. Title 13, CCR, subsection 1956.8(j) defines this as an engine that is normally used in vehicles with a gross weight between 19,500 to 33,000 lb.

Subsections (b)(6)(A)(iv)c. and (b)(6)(A)(v)b.3.

Purpose

The purpose of the proposed amendments to these subsections is to indicate that the “emission level” discussed in these subsections are NOx emission levels.

Rationale

The proposed amendments are needed for additional emphasis, since the subsections only refer to NOx emission standards, so the emission levels being referred to are clearly NOx emission levels.

Subsections (b)(6)(A)(iv)d., (b)(6)(A)(iv)e., (b)(6)(A)(v)b.4., and (b)(6)(A)(v)b.5.

Purpose

The purpose of the proposed amendments to these subsections is to modify the nonconformance criteria for OBD emission enforcement testing for HDEs certified to the proposed more stringent FTP NMHC and CO emission standards applicable for 2027 and subsequent MYs. Specifically, for engines certified to an FTP NMHC emission standard of 0.140 g/bhp-hr or lower or an FTP CO standard of 15.5 g/bhp-hr or lower for diesel/CI engines or 14.4 g/bhp-hr or lower for gasoline/SI engines, the proposed amendments would modify the NMHC and CO criteria in subsections 1971.5(b)(6)(A)(iv)a. and 1971.5(b)(6)(A)(v)b.1., specifically the criterion for the “20% of the NMHC, CO... emission standard above the emission level at which the malfunction was detected when the OBD system was approved by the Executive Officer.” The proposal would base the “20%” on an FTP NMHC emission standard of 0.140 g/bhp-hr and on an FTP CO standard of 15.5 g/bhp-hr for diesel/CI engines and 14.4 g/bhp-hr for gasoline/SI engines. So the deficient emission threshold monitor would be considered nonconforming if the MIL is not properly illuminated when (1) NMHC emissions exceed 0.028 g/bhp-hr above the emission level at which a malfunction was detected when the OBD system was approved by the Executive Officer, or (2) CO emissions exceed 3.1 g/bhp-hr (for diesel/CI engines) or 2.88 g/bhp-hr (for gasoline/SI engines) above the emission level at

which a malfunction was detected when the OBD system was approved by the Executive Officer.

Rationale

The proposed amendments are needed to accommodate engines certifying to the proposed lower FTP NMHC and CO emission standards. Currently, emission threshold monitors can be granted deficiencies and the OBD system certified if the monitor cannot detect a malfunction before emissions exceeded the malfunction criteria but can detect a malfunction before emissions exceeded the mandatory recall emission levels specified in the HD OBD enforcement regulation subsection 1971.5(d)(3). In section 1971.5, deficient emission threshold monitors would be considered nonconforming if testing found that the monitor could not illuminate the MIL when emissions exceeded 20% of the emission standard above the emission level at which a malfunction was detected when the OBD system was approved by the Executive Officer. During the 2020 Omnibus rulemaking, CARB staff adopted amendments to these nonconformance criteria in subsections 1971.5(b)(6)(A)(iv) and (v) to accommodate the lower NOx standards that were adopted at the same time. Specifically, for engines certified to these lower NOx standards (i.e., 0.10 g/bhp-hr or lower NOx), the “20% of the NOx emission standard” criterion in subsections 1971.5(b)(6)(iv)a. and 1971.5(b)(6)(A)(v)b.1. will use 0.02 g/bhp-hr as the “NOx emission standard,” with 20% of this standard being 0.04 g/bhp-hr. These amendments were adopted to align with the amendments to the NOx malfunction criteria for emission threshold monitors adopted in subsections 1971.1(g)(5.2), and will provide enough margin from the emission level at which the monitor was granted a deficiency. Considering similar amendments to the NMHC and CO malfunction criteria are being proposed in the HD OBD regulation section 1971.1 with this rulemaking (refer to the purpose and rationale for subsections 1971.1(g)(5.1.2) and (g)(5.2.2)), CARB staff is proposing similar amendments to the NMHC and CO nonconformance criteria for deficient emission threshold monitors in section 1971.5. While CARB staff determined that the “20% of the emission standard” criteria was appropriate based on data indicating the test-to-test variability scales with the current, higher NMHC and CO standards, CARB staff has not yet determined what the appropriate percentage should be for engines certified to the proposed lower NMHC and CO standards. CARB staff will evaluate the use of lower nonconformance criteria at a later rulemaking update.

Subsection (c)(2)(C)(i)c.

Purpose

The purpose of the proposed amendment to this subsection is to amend the minimum percentage of full UL mileage necessary for qualifying 2027 and subsequent MY engines for MST. Additionally, the minimum qualifying mileage is specified for each HDE weight class, with the minimum mileage for diesel/CI heavy HDEs reduced to 60% of full UL from 70% of full UL, the minimum mileage for diesel/CI medium HDEs reduced to 55% of full UL from 70%, the minimum mileage for diesel/CI light HDEs reduced to 50% full UL from 70%, and the minimum mileage for gasoline/SI engines reduced to 50% full UL from 70%.

Rationale

The proposed amendment is needed to address concerns from manufacturers of diesel/CI light HD, diesel/CI medium HD, diesel/CI heavy HD, and gasoline/SI engines, which are less likely to reach the required minimum full UL mileages and meet the testing deadlines given in subsection 1971.5(c)(3)(A) for MST of 2027 and subsequent MY engines. Specifically, for these engines, new full UL mileage standards were enacted in 40 CFR 1036.104 and subsequently adopted by CARB that increased the minimum mileage requirements from 110,000 to 270,000 miles, 185,000 to 350,000 miles, 435,000 to 650,000 miles, and 110,000 to 200,000 miles for diesel/CI light HD, diesel/CI medium HD, diesel/CI heavy HD, and gasoline/SI engines, respectively. CARB agrees to accept the manufacturers' proposal to set the diesel/CI light HD and gasoline/SI engines' minimum full UL mileage requirement to 50% of the 2027 and subsequent MY full UL mileage requirement. However, for diesel/CI medium HD and heavy HDEs, CARB staff determined that modifying the minimum percentage of the full UL mileage requirement is warranted based on the manufacturers' data which identified the percentage of fleet vehicles meeting the MST mileage requirement over time. CARB staff is proposing an additional year to complete the testing as discussed below under proposed changes for subsection 1971.5(c)(3)(A). CARB staff determined that allotting an additional year and modifying the minimum percentages of full UL mileage to 55 and 60% for diesel/CI medium HD and heavy HDEs, respectively, resulted in a higher percentage of the total population of fleet vehicles meeting the mileage requirements when compared to the manufacturers' proposal of 50% for all weight classes. The increase from 3 to 4 years is proposed in subsection 1971.5(c)(3)(A) to provide additional time to complete the testing required under subsection 1971.5(c)(3).

Subsection (c)(2)(C)(iii)a.

Purpose

The purpose of the proposed amendments to this subsection is to change the defined percentage of minimum full UL mileage to the newly specified percentages proposed in subsection 1971.5(c)(2)(C)(i)c.

Rationale

The proposed amendments are needed to align with the proposed changes made to subsection 1971.5(c)(2)(C)(i)c., which specify new minimum mileages for each HDE weight class (i.e., diesel/CI heavy HD, diesel/CI medium HD, and diesel/CI light HDEs) and gasoline/SI engines.

Subsection (c)(3)(A)

Purpose

The purpose of the proposed amendment to this subsection is to increase the time given for manufacturers of 2027 and subsequent MY engines to complete the MST required under subsection 1971.5(c)(3) from three calendar years to four calendar years.

Rationale

The proposed amendment is needed to provide additional time for manufacturers to acquire and complete testing on a real-world engine with sufficient mileage due to increased full useful mileage requirements for low NOx engines starting with the 2027 MY. CARB staff determined that four years was the appropriate amount of time to allow for these engines to achieve the additional mileage proposed by CARB staff in subsection 1971.5(c)(2)(C)(i)c. based on manufacturer's data estimating the percentage of fleet vehicles meeting the MST mileage requirement over time.

Subsection (c)(6)(A)

Purpose

The purpose of the proposed amendment to this subsection is to require manufacturers to submit the report for the MST results using CARB form ECCD/OBD-126 "manufacturer self-testing Template," February 2023, starting on January 1, 2027.

Rationale

The proposed amendment is needed to ensure all manufacturers are using the same form for reporting of the test results, which would ensure all the required information are included and would help CARB staff efficiently review the report. Most manufacturers are currently already using this new form for submitting the required testing results.

Subsection (d)(3)(A)(vii)

Purpose

The purpose of the proposed amendment to this subsection is to exclude the comprehensive component monitor readiness group from ordered mandatory recall and repair when the Executive Officer makes a finding of nonconformance with regards to the readiness status during enforcement testing.

Rationale

The proposed amendment is needed to address manufacturers' concerns regarding the challenges they face in the implementation of comprehensive component readiness bits for SAE J1979-2. Subsection 1971.5(d)(3)(A)(vii) of the HD OBD enforcement regulation requires the Executive Officer to order a 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 subsection 1971.5(b) or (c) or information received from the manufacturer indicates that valid and correct readiness status cannot be obtained. For engines using SAE J1979 or SAE J1939, the readiness status for the gasoline and diesel comprehensive components is required to always indicate "complete." However, for engines using SAE J1979-2, the readiness bit is required to indicate "complete" only under the circumstances described in subsection 1971.1(h)(4.1.2)(B). Manufacturers have expressed concerns about the infrequent conditions required for some of the comprehensive component monitors to run, making it difficult to set the overall readiness status to "complete." Therefore,

some state I/M programs have indicated their plans to ignore the comprehensive component monitor readiness status for these engines during inspections, at least for the near term. Manufacturers have also argued that the comprehensive component readiness group is associated with a more significant number of monitors compared to other groups, which increases the potential for classification errors, and therefore should not be subject to mandatory recall if there are comprehensive component monitor readiness errors as these readiness bits will most likely be ignored during I/M. As such for 2030 and earlier MY engines that use SAE J1979-2, CARB staff is proposing to exclude the gasoline and diesel comprehensive component monitor readiness groups from the readiness groups that are considered in the mandatory recall criteria.

Subsections (e)(3)(C)(viii), (e)(3)(C)(ix)e., and (e)(5)

Purpose

The purpose of the proposed amendments to these subsections is to allow alternate methods other than a postcard for HDE manufacturers to collect information from new owners experiencing a recent transfer of ownership, but are subject to corrective action. For recalls that are performed over-the-air, the amendments would provide instructions for manufacturers to satisfy new notification and proof of correction certificate requirements.

Rationale

The proposed amendments are necessary since there are more efficient and faster methods to collect new owner information. Limiting the option to only use a postcard may be limiting in today's technology driven society. Newer technology allows manufacturers to conduct a recall involving software updates over-the-air. Amendments are necessary to alleviate manufacturers from the burden of providing proof of correction to owners who do not physically come into to the dealer network for recalls performed over-the-air.

Section 2035. Purpose, Applicability, and Definitions

Subsection (b)(1)(E)

Purpose

The purpose of the proposed amendments is to add clarification to the applicability of the proposed emissions warranty requirements for 2027 and subsequent model HDEs and HDVs and HD hybrid powertrains.

Rationale

The proposed amendments are necessary because the new 13 CCR 1956.8.2 section has been added with applicability to 2027 and subsequent MY HDEs and hybrid powertrains. This amendment clarifies the emissions warranty requirements of this section apply to California-certified 2027 and subsequent model HDVs and HD hybrid powertrains regardless of their location of registration.

Subsection (c)(2)

Purpose

The purpose of this subsection is to define “Warrantable condition.” The subsection is amended to add section 2039 as one of the applicable sections.

Rationale

The proposed amendment is necessary to clarify that warranty requirements in section 2039 are also applicable.

Subsection (c)(3)(C)

Purpose

The purpose of this subsection is to define “warranted part” for HDVs certified to the GHG emission standards of section 95663, title 17. The proposed amendment corrects a typographical error from “71” to “17.”

Rationale

The proposed amendment is necessary to reference the proper CCR title.

Subsection (c)(3)(F)

Purpose

The purpose of this subsection is to define “warranted part” for 2022 through 2026 MY hybrid powertrains certified pursuant to title 13, CCR, section 1956.8. The subsection has been modified to end the applicability in the 2026 MY.

Rationale

The proposed amendment is necessary to reflect the applicable MY, i.e., ending in the 2026 MY.

Subsection (c)(3)(H)**Purpose**

The purpose of this subsection is to define “warranted part” for 2027 and subsequent MY hybrid powertrains certified pursuant to title 13, CCR, section 1956.8.2.

Rationale

The proposed amendment is necessary to set forth the latest warranty requirements and properly reference the most recent CCR section.

Section 2036. Defects Warranty Requirements for 1979 Through 1989 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles; 1979 and Subsequent Model Motorcycles and Heavy-Duty Vehicles; and Motor Vehicle Engines Used in Such Vehicles; and 2020 and Subsequent Model Year Trailers

Subsection (a)

Purpose

The purpose of this subsection is to describe the applicability of the regulation. The proposed amendments clarify the acronym “CCR” and reference title 13, CCR, section 1956.8.2 for 2027 and subsequent MY hybrid powertrains certified pursuant to the new section.

Rationale

The proposed amendments are necessary to comply with the latest style and communication guide and properly reference the most recent CCR section.

Subsection (b)(2)(C)

Purpose

The purpose of this subsection is to specify general emissions warranty coverage for 2022 and subsequent MY hybrid powertrains for use in HDVs and MDVs. The subsection has been modified to introduce title 13, CCR, section 1956.8.2 for certification of 2027 and subsequent MY hybrid powertrains used in vehicles greater than 14,000 lb GVWR, and end the applicability in the 2026 MY for hybrid powertrains certified pursuant to title 13, CCR, section 1956.8 for use in vehicles from 10,001 to 14,000 lb GVWR. Warranty requirements for 2027 and subsequent MY hybrid powertrains certified pursuant to title 13, CCR, section 1956.8.2 for use in vehicles from 10,001 to 14,000 lb GVWR are covered in title 13, CCR, section 2037.

Rationale

The proposed amendments are necessary to properly reference the most recent CCR sections and reflect the applicable MY for MD hybrid powertrains, i.e., ending in the 2026 MY.

Subsection (c)(4)(B)

Purpose

The purpose of this subsection is to specify the warranty requirements for diesel powered HDEs for 2022 through 2026 MYs. The referenced subsection in title 13, CCR, section 2035 is updated from 2035(c)(2)(D) to 2035(c)(3)(D).

Rationale

The proposed amendment is necessary to properly reference the most recent CCR section.

Subsections (c)(4)(C) and (c)(4)(D)

Purpose

Subsections (c)(4)(C) and (c)(4)(D) specify the warranty requirements for CI HDEs for 2027 and subsequent MYs. The purpose of the proposed amendments is to align with the United States Environmental Protection Agency Clean Trucks Plan Final Rule for Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards Rule (EPA-NOx rule) with the following modifications: (1) eliminating the second phase (2031 and subsequent MYs) of the phase-in periods with the deletion of subsection (c)(4)(D) and to implement the same warranty requirements starting with the 2027 MY; (2) changing the terms “diesel,” “diesel-powered” and “diesel-cycle” to “compression-ignition.” In addition, the referenced subsection in title 13, CCR, section 2035 is updated from 2035(c)(2)(D) to 2035(c)(3)(E), and the referenced section for certification standards is updated from 1956.8 to the new 1956.8.2.

Rationale

The proposed amendments are necessary to set forth the new warranty requirements and to properly reference the most recent CCR sections.

Subsections (c)(8)(C) and (c)(8)(D)

Purpose

Subsections (c)(8)(C) and (c)(8)(D) specify the warranty requirements for SI HDEs for 2027 and subsequent MYs. The purpose of the proposed amendments is to align with the EPA-NOx rule with the following modifications: (1) eliminating the second phase (2031 and subsequent MYs) of the phase-in periods with the deletion of subsection (c)(8)(D) and to implement the same warranty requirements starting with the 2027 MY; (2) changing the terms “Otto-cycle” to “spark-ignition.” In addition, the referenced subsection in title 13, CCR, section 2035 is updated from 2035(c)(2)(E) to 2035(c)(3)(E), and the referenced section for certification standards is updated from 1956.8 to the new 1956.8.2.

Rationale

The proposed amendments are necessary to set forth the new warranty requirements and to properly reference the most recent CCR sections.

Subsection (c)(10)

Purpose

The purpose of this subsection is to specify the warranty period for 2022 through 2026 hybrid powertrains certified pursuant to title 13, CCR, section 1956.8. The subsection has been modified to end the applicability in the 2026 MY.

Rationale

The proposed amendment is necessary to reflect the applicable MY, i.e., ending in the 2026 MY.

Subsection (c)(11)

Purpose

The purpose of this subsection is to specify the warranty period for 2027 and subsequent MY hybrid powertrains certified pursuant to title 13, CCR, section 1956.8.2.

Rationale

The proposed amendment is necessary to set forth the new warranty requirements for hybrid powertrains and reference the most recent CCR section.

Subsection (d)(2)(D)

Purpose

The purpose of this subsection is to define the requirements for any warranted part that is scheduled only for regular inspection, used in 2022 and subsequent MY hybrid powertrains for use in HDVs and MDVs. The subsection has been modified to introduce the new title 13, CCR, section 1956.8.2 for certification of 2027 and subsequent MY hybrid powertrains used in vehicles greater than 14,000 lb GVWR, and end the applicability in the 2026 MY for hybrid powertrains certified under title 13, CCR, section 1956.8 for use in vehicles from 10,001 to 14,000 lb GVWR. Requirements for 2027 and subsequent MY hybrid powertrains certified pursuant to title 13, CCR, section 1956.8.2 for use in vehicles from 10,001 to 14,000 lb GVWR are covered in title 13, CCR, section 2037.

Rationale

The proposed amendments are necessary to properly reference the most recent CCR sections and clarify the applicable MY for MD hybrid powertrains, i.e., ending in the 2026 MY.

Subsection (d)(3)(D)

Purpose

The purpose of this subsection is to define the requirements for warranted part that is scheduled for replacement as required in maintenance instructions, used in 2022 and subsequent MY hybrid powertrains for use in HDVs and MDVs. The subsection has been modified to introduce the new title 13, CCR, section 1956.8.2 for certification of 2027 and subsequent MY hybrid powertrains used in vehicles greater than 14,000 lb GVWR, and end the applicability in the 2026 MY for hybrid powertrains certified under title 13, CCR, section 1956.8 for use in vehicles from 10,001 to 14,000 lb GVWR. The proposed amendments reference existing subsection (c)(10) and new subsection (c)(11) of this section for the applicable warranty period for the hybrid vehicles and hybrid powertrains. Requirements for 2027 and subsequent MY hybrid powertrains certified pursuant to title 13, CCR, section 1956.8.2 for use in vehicles from 10,001 to 14,000 lb GVWR are covered in title 13, CCR, section 2037.

Rationale

The proposed amendments are necessary to properly reference the most recent CCR sections and clarify the applicable MY for MD hybrid powertrains, i.e., ending in the 2026 MY.

Subsection (f)(1)(A)

Purpose

The purpose of this subsection is to require manufacturers to furnish each GHG certified HD vehicle with a list of the warranted parts that includes any part specified in 40 CFR 1037.120. The proposed amendment updates the referenced subsection in title 13, CCR, section 2035 from 2035(c)(2)(C) to 2035(c)(3)(C).

Rationale

The proposed amendment is necessary to properly reference the most recent CCR section.

Subsection (f)(1)(D)

Purpose

The purpose of this subsection is to require manufacturers to provide a list that includes any emission-related part that can cause the vehicle's OBD MIL to illuminate for 2022 and subsequent MY hybrid powertrains for use in HDVs and MDVs. The subsection has been modified to introduce the new title 13, CCR, section 1956.8.2 for certification of 2027 and subsequent MY hybrid powertrains used in vehicles greater than 14,000 lb GVWR, and end the applicability in the 2026 MY for hybrid powertrains certified under title 13, CCR, section 1956.8 for use in vehicles from 10,001 to 14,000 lb GVWR. Requirements for 2027 and subsequent MY hybrid powertrains certified pursuant to title 13, CCR, section 1956.8.2 for use in vehicles from 10,001 to 14,000 lb GVWR are covered in title 13, CCR, section 2037.

Rationale

The proposed amendments are necessary to properly reference the most recent CCR sections and clarify the applicable MY for MD hybrid powertrains, i.e., ending in the 2026 MY.

Section 2037. Defects Warranty Requirements for 1990 and Subsequent Model Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, and Motor Vehicle Engines Used in Such Vehicles

Subsection (a)

Purpose

The purpose of this subsection is to describe the applicability of the regulation. The subsection is amended to include applicability of MDEs and MD hybrid powertrains certified under title 13, CCR, section 1956.8.2 for use in vehicles with a GVWR from 10,001 to 14,000 lb.

Rationale

The proposed amendment is necessary to ensure that all applicable MDEs and MD hybrid powertrains are covered in this section.

Subsection (b)

Purpose

The purpose of this subsection is to specify general emission warranty coverage requirements. The subsection is amended to include warranty requirements for 2027 and subsequent MY MDEs and MD hybrid powertrains certified under title 13, CCR, section 1956.8.2 for use in vehicles with a GVWR from 10,001 to 14,000 lb.

Rationale

The proposed amendment is necessary to guarantee that MDEs and MD hybrid powertrains will also conform to the applicable regulations and remain free from defects for a specified period.

Section 2038. Performance Warranty Requirements for 1990 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and Motor Vehicle Engines Used in Such Vehicles

Subsection (a)

Purpose

The purpose of this subsection is to describe the applicability of the regulation. The subsection is amended to include changes to the performance warranty requirements for 2027 and subsequent MY MDEs and MD hybrid powertrains certified under title 13, CCR, section 1956.8.2 for use in vehicles with a GVWR from 10,001 to 14,000 lb.

Rationale

The proposed amendment is necessary to ensure that new performance warranty requirements for MDEs and MD hybrid powertrains are described in this section.

Subsection (b)

Purpose

The purpose of this subsection is to specify performance emission warranty coverage requirements. The subsection is amended to include warranty requirements for 2027 and subsequent MY MDEs and MD hybrid powertrains certified under title 13, CCR, section 1956.8.2 for use in vehicles with a GVWR from 10,001 to 14,000 lb.

Rationale

The proposed amendment is necessary to guarantee that MDEs and MD hybrid powertrains will conform to the new requirements for 2027 and subsequent MYs and remain free from defects for the specified period.

Section 2039. Emissions Control System Warranty Statement

Subsection (a)

Purpose

The purpose of this subsection is to require manufacturers to provide a clear and comprehensive emissions control system warranty statement with each new vehicle or engine produced after January 24, 1991. This warranty statement is designed to inform vehicle owners of their rights and obligations regarding the emissions control system. The subsection is amended to include warranty requirements for 2027 and subsequent MY MDEs and MD hybrid powertrains certified under title 13, CCR, section 1956.8.2 for use in vehicles with a GVWR from 10,001 to 14,000 lb.

Rationale

The proposed amendment is necessary to ensure that new warranty requirements for MDEs and MD hybrid powertrains are described in this section.

Section 2112. Definitions

Subsection (h) “Nonconformity” or “noncompliance”

Purpose

The purpose of this subsection is to define “Nonconformity” or “noncompliance.” The proposed amendments change the referenced test procedures from 2004-DTPS to 2026-DTPS for 2004 through 2026 model HDDEs and HDVs and from 2004-OTTO-TPS to 2026-OTTO-TPS for 2004 through 2026 model HD Otto-cycle engines, and introduce the new title 13, CCR, section 1956.8.2 and 2027-TPS for 2027 and subsequent model HDEs, HDV and HD powertrains, which will take effect starting with the 2027 MY.

Rationale

The proposed amendments are necessary to properly reference the most recently amended version of the test procedures and regulation order. All requirements in the existing test procedures will only apply through the end of the 2026 MY, and a new section title 13, CCR, section 1956.8.2 and a new set of test procedures incorporated by reference in the new section will be introduced to cover all HDE and powertrain productions for 2027 and subsequent MYs.

Subsection (I)(18)

Purpose

The purpose of this subsection is to define “useful life” for passenger cars, LD trucks, and MDVs. This subsection has been modified to end the applicability of title 13, CCR, section 1956.8 in 2026 MY engines.

Rationale

The proposed amendments are necessary to set forth the new UL requirements and properly reference the most recent CCR sections.

Subsection (I)(18.1)

Purpose

The purpose of this subsection is to specify the UL for 2027 and subsequent MY CI engines certified to the applicable criteria pollutant emission standards and used in MDVs with a GVWR from 10,001 to 14,000 lb.

Rationale

The proposed amendments are necessary to set forth the new UL requirements and properly reference the most recent CCR section.

Subsection (I)(18.2)

Purpose

The purpose of this subsection is to specify the UL for 2027 and subsequent MY SI engines certified to the applicable criteria pollutant emission standards and used in MDVs with a GVWR from 10,001 to 14,000 lb.

Rationale

The proposed amendments are necessary to set forth the new UL requirements and properly reference the most recent CCR section.

Subsection (I)(18.3)

Purpose

The purpose of this subsection is to specify the UL for 2027 and subsequent MY engines certified to the applicable GHG standards and used in MDVs with a GVWR from 10,001 to 14,000 lb.

Rationale

The proposed amendments are necessary to set forth the UL requirements and properly reference the most recent CCR section. No changes have been made to 2027 and subsequent MY GHG standards and requirements, including the UL period. The actual GHG standards and requirements have only been moved to the new title 13, CCR, section 1956.8.2 to make it easier for stakeholders to look up both the criteria pollutant and GHG standards and requirements for 2027 and later MYs in one document.

Subsections (I)(19)(B) and (I)(19)(C)

Purpose

The purpose of these subsections is to define “useful life” for 2027 and subsequent MY light HD CI engines certified to the applicable criteria pollutant emission standards. These subsections have been modified to eliminate the second phase of the phase-in periods (2031 and subsequent MYs) and to align with the EPA-NOx rule starting with the 2027 MY. The existing subsection (I)(19)(C) is deleted because of the elimination of the second phase-in period.

Rationale

The proposed amendments are necessary to set forth the new UL requirements.

Subsection (I)(19)(D)

Purpose

The purpose of this subsection is to define “useful life” for 2024 and subsequent MY diesel engines used in MDVs with a GVWR from 10,001 to 14,000 lb. This subsection has been deleted because the requirements have been covered in subsection (I)(18).

Rationale

The proposed amendment is necessary to streamline the regulation and reduce potential confusion by consolidating all the relevant requirements in a single subsection.

Subsection (I)(19.1)

Purpose

The purpose of this subsection is to define “useful life” for 2014 through 2026 MY light HD diesel engines and 2027 and subsequent MY light HDEs certified to the applicable GHG emission standards. This subsection has been modified to end the applicability of title 13, CCR, sections 1956.8(a)(7) and 1956.8(h)(6) in 2026 MY engines and introduce new title 13, CCR, section 1956.8.2(b)(7) for 2027 and subsequent MY engines.

Rationale

The proposed amendments are necessary to properly reference the most recent CCR sections. No changes have been made to 2027 and subsequent MY GHG standards and requirements. The actual GHG standards and requirements have only been moved to the new title 13, CCR, section 1956.8.2 to make it easier for stakeholders to look up both the criteria pollutant and GHG standards for 2027 and later MYs in one document.

Subsections (I)(20)(B) and (I)(20)(C)

Purpose

The purpose of these subsections is to define “useful life” for 2027 and subsequent MY medium HDEs certified to the applicable criteria pollutant emission standards. These subsections have been modified to eliminate the second phase of the phase-in periods (2031 and subsequent MYs) and to align with the EPA-NOx rule starting with the 2027 MY. The existing subsection (I)(20)(C) is deleted because of the elimination of the second phase-in period.

Rationale

The proposed amendments are necessary to set forth the new UL requirements.

Subsection (I)(20.1)

Purpose

The purpose of this subsection is to define “useful life” for 2014 through 2026 MY medium HDDEs and 2027 and subsequent MY medium HDEs certified to the applicable GHG emission standards. This subsection has been modified to end the applicability of title 13, CCR, subsection 1956.8(a)(7) in 2026 MY engines and introduce new title 13, CCR, subsection 1956.8.2(b)(7) for 2027 and subsequent MY engines.

Rationale

The proposed amendments are necessary to properly reference the most recent CCR sections. No changes have been made to 2027 and subsequent MY GHG standards and requirements. The actual GHG standards and requirements have only been moved to the new title 13, CCR, section 1956.8.2 in order to make it easier for stakeholders to look up both the criteria pollutant and GHG standards for 2027 and later MYs in one document.

Subsections (I)(21)(B) and (I)(21)(C)

Purpose

The purpose of these subsections is to define “useful life” for 2027 and subsequent MY heavy HDEs certified to the applicable criteria pollutant emission standards. These subsections have been modified to eliminate the second phase of the phase-in periods (2031 and subsequent MYs) and to align with the EPA-NOx rule starting with the 2027 MY. The existing subsection (I)(21)(C) is deleted because of the elimination of the second phase-in period.

Rationale

The proposed amendments are necessary to set forth the new UL requirements.

Subsection (I)(21.1)

Purpose

The purpose of this subsection is to define “useful life” for 2014 through 2026 MY heavy HDDEs and 2027 and subsequent MY heavy HDEs certified to the applicable GHG emission standards. This subsection has been modified to end the applicability of title 13, CCR, subsection 1956.8(a)(7) in 2026 MY engines and introduce new title 13, CCR, subsection 1956.8.2(b)(7) for 2027 and subsequent MY engines.

Rationale

The proposed amendments are necessary to properly reference the most recent CCR sections. No changes have been made to 2027 and subsequent MY GHG standards and requirements. The actual GHG standards and requirements have only been moved to the new title 13, CCR, section 1956.8.2 to make it easier for stakeholders to look up both the criteria pollutant and GHG standards for 2027 and later MYs in one document.

Subsections (I)(22)(B) and (I)(22)(C)

Purpose

The purpose of these subsections is to define “useful life” for 2027 and subsequent MY HD SI engines certified to the applicable criteria pollutant emission standards. These subsections have been modified to eliminate the second phase of the phase-in periods (2031 and subsequent MYs) and to align with the EPA-NOx rule starting with the 2027 MY. The existing subsection (I)(22)(C) is deleted because of the elimination of the second phase-in period.

Rationale

The proposed amendments are necessary to set forth the new UL requirements.

Subsection (I)(22)(D)

Purpose

The purpose of this subsection is to define “useful life” for 2024 and subsequent MY Otto-Cycle engines used in MDVs with a GVWR from 10,001 to 14,000 lb. This subsection has been modified to end the applicability in the 2026 MY. This subsection has been deleted because the requirements have been covered in subsection (I)(18).

Rationale

The proposed amendment is necessary to streamline the regulation and reduce potential confusion by consolidating all the relevant requirements in a single subsection.

Subsection (I)(22.1)

Purpose

The purpose of this subsection is to define “useful life” for 2014 through 2026 MY HD Otto-Cycle engines and 2027 and subsequent MY HD SI engines certified to the applicable GHG emission standards. This subsection has been modified to end the applicability of title 13, CCR, subsections 1956.8(c)(4) and 1956.8(h)(6) in 2026 MY engines and introduce new title 13, CCR, subsection 1956.8.2(b)(7), and new term, “spark-ignition,” for 2027 and subsequent MY engines.

Rationale

The proposed amendments are necessary to properly reference the most recent CCR sections. No changes have been made to 2027 and subsequent MY GHG standards and requirements. The actual GHG standards and requirements have only been moved to the new title 13, CCR, section 1956.8.2 in order to make it easier for stakeholders to look up both the criteria pollutant and GHG standards for 2027 and later MYs in one document.

Subsection (I)(23)

Purpose

The purpose of this subsection is to define “useful life” for 2022 through 2026 MY hybrid powertrains optionally certified pursuant to title 13, CCR, section 1956.8 for criteria pollutant emission standards. This subsection has been modified to end the applicability of title 13, CCR, section 1956.8 in 2026 MY engines and specify the specific applicable subsections.

Rationale

The proposed amendments are necessary to reflect the MY requirement, i.e., ending in the 2026 MY, and reference the corresponding subsections.

Subsection (I)(23.1)

Purpose

The purpose of this subsection is to define “useful life” for 2027 and subsequent MY hybrid powertrains certified pursuant to title 13, CCR, section 1956.8.2 for criteria pollutant emission standards.

Rationale

The proposed amendments are necessary to set forth the new UL requirements and properly reference the most recent CCR sections.

Subsection (I)(23.2)

Purpose

The purpose of this subsection is to define “useful life” for 2027 and subsequent MY hybrid powertrains certified pursuant to title 13, CCR, section 1956.8.2 for GHG emission standards.

Rationale

The proposed amendments are necessary to set forth the new UL requirements and properly reference the most recent CCR sections.

Section 2116. Repair Label

Subsection (d)

Purpose

The purpose of these amendments is to provide conditions that, when satisfied, will remove the repair label requirement for California-certified HD CI and SI engines and vehicles. These conditions are already allowed under current regulations such as title 13, CCR, section 1971.5(e)(4)(D).

Rationale

The proposed amendments are necessary to provide California-certified HD CI and SI engine and vehicle manufacturers with the same exclusion as sections in title 13, CCR, Chapter 2 when the conditions are consistent with title 13, CCR, Chapter 1, section 1971.5(e)(4)(D).

Section 2117. Proof of Correction Certificate

Purpose

The purpose of this amendment is to provide instruction regarding new proof of correction certificate requirements for California-certified HD CI and SI engine and vehicle manufacturers to follow when conducting recalls that are performed by an over-the-air connection.

Rationale

Recent technology allows manufacturers to conduct a recall involving software updates over-the-air. The proposed amendments are necessary to alleviate manufacturers from the burden of providing proof of correction to owners who do not physically come into the dealer network for a recall performed over-the-air.

Section 2118. Notification

Subsection (f)

Purpose

The purpose of this amendment is to provide alternate methods other than using a postal card for California-certified HD CI and SI engine and HD vehicle manufacturers to collect new owners' information whose vehicle experiences a recent transfer of ownership but are subjected to corrective action.

Rationale

The proposed amendment is necessary since there are more efficient and faster methods to collect new owners' information. Limiting the option to only use a postal card may not be expeditious in today's technology driven society.

Subsection (i)

Purpose

The purpose of these amendments is to provide instructions for California-certified HD CI and SI engines and HD vehicle manufacturers to follow to inform owners what to expect regarding proof of correction certificate requirements when recalls are performed over-the-air.

Rationale

The proposed amendments are necessary to make sure owners know what to expect to avoid any confusion that might occur in the first six months of recalls performed over-the-air.

Section 2127. Notification of Owners

Subsection (d)(9)

Purpose

The purpose of this amendment is to provide alternate methods other than using a postal card for California-certified HD CI and SI engine and HD vehicle manufacturers to collect new owners' information whose vehicle experiences a recent transfer of ownership but are subjected to corrective action.

Rationale

The proposed amendment is necessary since there are more efficient and faster methods to collect new owners' information. Limiting the option to only use a postal card may not be expeditious in today's technology driven society.

Subsection (d)(12)

Purpose

The purpose of these amendments is to provide instructions for California-certified HD CI and SI engines and HDV manufacturers to follow to inform owners what to expect regarding proof of correction certificate requirements when recalls are performed over-the-air.

Rationale

The proposed amendments are necessary to make sure owners know what to expect to avoid any confusion that might occur in the first six months of recalls performed over-the-air.

Section 2128. Repair Label

Subsection (d)

Purpose

The purpose of these amendments is to provide conditions that, when satisfied, will remove the repair label requirement for California-certified HD CI and SI engines and vehicles. These conditions are already allowed under current regulations such as title 13, CCR, section 1971.5(e)(4)(D).

Rationale

The proposed amendments are necessary to provide California-certified HD CI and SI engine and vehicle manufacturers with the same exclusion as sections in title 13, CCR, Chapter 2, when the conditions are consistent with title 13, CCR, Chapter 1, section 1971.5(e)(4)(D).

Section 2129. Proof of Correction Certificate

Purpose

The purpose of this amendment is to provide instructions regarding new proof of correction certificate requirements for California-certified HD CI and SI engine and vehicle manufacturers to follow when conducting recalls that are performed by an over-the-air connection.

Rationale

Recent technology allows manufacturers to conduct a recall involving software updates over-the-air. The proposed amendments are necessary to alleviate manufacturers from the burden of providing proof of correction to owners who do not physically come into to the dealer network for a recall performed over-the-air.

Section 2139. Testing

Subsection (c)

Purpose

The purpose of this subsection is to describe the IUC emission tests that CARB or its designated laboratory will perform for MDEs and MDVs certified in accordance with the applicable title 13, CCR, sections 1956.8 and 1956.8.2, the latter of which is introduced with the proposed amendments.

Rationale

The proposed amendments are necessary to properly reference the most recent CCR sections.

Subsection (d)

Purpose

The purpose of this subsection is to specify the procedures for performing IUC emission tests for HDEs, HDVs, and HD trailers according to the relevant CCR sections. The proposed amendments change the referenced test procedure from 2004-DTPS to 2026-DTPS, and from 2004-OTTO-TPS to 2026-OTTO-TPS, and introduce the new 2027-TPS which will take effect starting with the 2027 MY.

Rationale

The proposed amendments are necessary to modify the title of the referenced test procedures in this subsection because the title of the document has been modified in this rulemaking. All requirements in the existing test procedures will only apply through the end of the 2026 MY, and a new set of test procedures incorporated by reference in title 13, CCR, section 1956.8.2(c) will be introduced to cover all HDE productions for 2027 and subsequent MYs.

Section 2139.5. CARB Authority to Test for Heavy-Duty In-Use Compliance

Subsection (a)

Purpose

The purpose of this subsection is to authorize CARB Executive Officer to conduct HDIUC testing for 2026 and previous MYs using specified test procedures. The referenced test procedures have been amended from 2004-DTPS to 2026-DTPS, and from 2004-OTTO-TPS to 2026-OTTO-TPS.

Rationale

The proposed amendment is necessary to modify the title of the referenced test procedures in this subsection because the title of the document has been modified in this rulemaking. All requirements in the existing test procedures will only apply through the end of the 2026 MY, and a new set of test procedures will be introduced to cover all HDE productions for 2027 and subsequent MYs.

Subsection (b)

Purpose

The purpose of this subsection is to authorize CARB Executive Officer to conduct HDIUC testing for 2027 and subsequent MYs using the new 2027-TPS which will take effect starting with the 2027 MY.

Rationale

The proposed amendment is necessary to properly reference the most recently amended version of the test procedures. A new set of test procedures will be introduced to cover all HDE productions for 2027 and subsequent MYs.

Subsection (c)

Purpose

The purpose of this subsection is to describe the purpose of the HDIUC program. This part is split from the original paragraph and listed as a new subsection for clarity purposes.

Rationale

The proposed amendment is necessary to clarify the purpose of the HDIUC program.

Section 2140. Notification and Use of Test Results

Subsection (b)

Purpose

Under this section, if the results of the in-use vehicle emission tests exceed the applicable emission standards, the entire vehicle population represented shall be deemed to exceed such standards. The manufacturer will be notified and given sufficient time to submit an influence recall plan. Otherwise, the Executive Officer may order corrective action and recall of the affected vehicles. The proposed amendment adds the new title 13, CCR, section 1956.8.2 as applicable emission standards to this section.

Rationale

The proposed amendment is necessary to clarify the new title 13, CCR, section 1956.8.2 is also applicable to this section.

Subsection (c)

Purpose

The purpose of this subsection is to specify the failure criteria and the test procedures for an engine family. The proposed amendments end current failure criteria in the 2026 MY pursuant to the amended test procedures 2026-DTPS and 2026-OTTO-TPS, and introduce new failure criteria for 2027 and subsequent model engines pursuant to the new test procedures 2027-TPS in accordance with title 13, CCR, subsection 1956.8.2(c).

Rationale

The proposed amendments are necessary to end applicability of the existing test procedures by the end of the 2026 MY and introduce a new set of test procedures to cover all HDE productions for 2027 and subsequent MYs.

Section 2143. Failure Levels Triggering Recall and Corrective Action

Purpose

The purpose of these amendments is to provide clarification for corrective action and reporting requirements for 2027 and subsequent MY California-certified HD CI and SI engines and HDVs, as CARB is harmonizing Omnibus regulations with the EPA-NOx rule.

Rationale

The amendments are necessary since the warranty period for 2027 and subsequent MY California-certified HD CI and SI engines and vehicles is proposed to be extended to 10 years. Without these amendments, manufacturers will not be required to report issues nor provide necessary corrective action beyond the seventh year for MYs 2027 to 2030 under current regulations.

Section 2148. Evaluation of Need for Recall

Subsection (b)(1)

Purpose

The purpose of this amendment is to eliminate the potential administrative printing error of omitting the less-than sign (“<”) which occurred in previously approved regulations.

Rationale

The amendment is necessary since the error has occurred in the past. To avoid this same administrative error occurring in the future the “less than” sign is replaced with the phrase “less-than.” This amendment is also to ensure that this necessary factor is not erroneously overlooked when the Executive Officer considers whether a recall is automatically required or not.

Section 2169.2. Notification of Owners

Subsection (d)(10)

Purpose

The purpose of this amendment is to provide alternate methods other than using a postal card for California-certified HD CI and SI engine and HDV manufacturers to collect new owners' information whose vehicle experiences a recent transfer of ownership but are subjected to corrective action.

Rationale

The proposed amendment is necessary since there are more efficient and faster methods to collect new owners' information. Limiting the option to only use a postal card may not be expeditious in today's technology driven society.

Subsection (d)(13)

Purpose

The purpose of these amendments is to provide instructions for California-certified HD CI and SI engines and HDV manufacturers to follow to inform owners what to expect regarding proof of correction certificate requirements when recalls are performed over-the-air.

Rationale

The proposed amendments are necessary to make sure owners know what to expect to avoid any confusion that might occur in the first six months of recalls performed over-the-air.

Section 2169.3. Repair Label

Subsection (d)

Purpose

The purpose of these amendments is to provide conditions that, when satisfied, will remove the repair label requirement for California-certified HD CI and SI engines and vehicles. These conditions are already allowed under current regulations such as 13 CCR 1971.5(e)(4)(D).

Rationale

The proposed amendments are necessary to provide California-certified HD CI and SI engine and vehicle manufacturers with the same exclusion as sections in title 13, CCR, Chapter 2 when the conditions are consistent with title 13, CCR, Chapter 1, section 1971.5(e)(4)(D).

Section 2169.4. Proof of Correction Certificate

Purpose

The purpose of this amendment is to provide instructions regarding new proof of correction certificate requirements for California-certified HD CI and SI engine and vehicle manufacturers to follow when conducting recalls that are performed by an over-the-air connection.

Rationale

Recent technology allows manufacturers to conduct a recall involving software updates over-the-air. The proposed amendments are necessary to alleviate manufacturers from the burden of providing proof of correction to owners who do not physically come into to the dealer network for a recall performed over-the-air.

Section 2485. Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.

Subsection (d)(1)

Purpose

The purpose of this amendment is to provide exemption from the 5-minute idling restriction for 2027 and subsequent model year HD CI engines certified to CARB's Clean Idle NOx standard and correctly specify the references to the applicable certification test procedures.

Rationale

The proposed amendment is necessary to correctly specify the references to the certification test procedures that are applicable to HD engines certified to the Clean Idle NOx standards. Since CARB staff is proposing to end the applicability of the existing test procedure by the end of MY 2026 and introduce new test procedures that apply to 2027 and subsequent MY HD CI engines, it is necessary that the two test procedures be appropriately referenced in this subsection.

References

1. (CARB, 2018) Staff Report: Initial Statement of Reasons, *Public Hearing to Consider Revisions to On-Board Diagnostic System Requirements, Including the Introduction of Real Emissions Assessment Logging (REAL), for Heavy-Duty Engines, Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines*, California Air Resources Board, Scheduled for Consideration: November 15, 2018.
2. (CARB, 2020) Staff Report: Initial Statement of Reasons, *Public Hearing to Consider the Proposed Heavy-Duty Engine and Vehicle Omnibus Regulation and Associated Amendments*, California Air Resources Board, Scheduled for Consideration: August 27, 2020.
3. (CARB, 2021) Staff Report: Initial Statement of Reasons, *Public Hearing to Consider the Proposed Revisions to the On-Board Diagnostic System Requirements and Associated Enforcement Provisions for Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles and Engines, and Heavy-Duty Engines*, California Air Resources Board, Scheduled for Consideration: July 22, 2021.