

APPENDIX B

SUMMARY AND RATIONALE FOR EACH PROPOSED REGULATORY PROVISION

The proposed Regulation to Provide Certification Flexibility for Innovative Heavy-Duty Engines and California Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Hybrid Conversion Systems (Innovative Technology Regulation or ITR) and proposed amendments to California Code of Regulations, title 13, section 1956.8 are designed to encourage early development and deployment of innovative truck and bus technologies that the State needs to meet its air quality and climate goals. The ITR is structured to achieve this by providing critical innovative truck and bus technologies with targeted, short-term certification flexibility, while maintaining the ability to ensure they achieve their anticipated in-use emission reductions. This appendix discusses the requirements and rationale for each provision of the proposed regulation and amendments.

SECTION 2208: PURPOSE, APPLICABILITY, DEFINITIONS, AND REFERENCES

Summary and Rationale for Section 2208 (a) Purpose

Section 2208(a) states the purpose of the regulation. This section is needed to inform truck and bus technology manufacturers and other interested parties of the ITR's intent.

Summary and Rationale for Section 2208 (b) Applicability

Section 2208(b) identifies the truck and bus technologies that are eligible for the regulation. This section is needed to identify the advanced technologies that would be eligible for the ITR.

Summary and Rationale for Section 2208 (c) Definitions

Section 2208(c) defines the terms, and outlines the acronyms, used in the ITR. It is necessary that ARB defines terms used in the ITR, so that regulated persons and entities can understand what they are reading.

Summary and Rationale for Section 2208 (d) Severability

This section provides that if any provision(s) of the ITR is held invalid by a court with jurisdiction, the remaining provisions will still be valid and enforceable. This provision gives manufacturers certainty that they can continue to rely on and follow the ITR.

SECTION 2208.1:
CERTIFICATION FLEXIBILITY FOR INNOVATIVE HEAVY-DUTY ENGINE
TECHNOLOGY

Section 2208.1(a) General Requirements

Summary and Rationale for Section 2208.1 (a)(1)

This section clarifies for engine manufacturers that a heavy-duty engine for which they are applying for certification pursuant to the ITR must continue to meet existing ARB engine certification requirements unless otherwise indicated in the ITR. This is needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (a)(2)

This section indicates that a heavy-duty engine family for which a participating engine manufacturer is applying to ARB for certification must achieve emission reductions beyond what is required by engine emission certification standards for that engine's model year (MY) in order to be eligible to be certified using the ITR. This section also explains that such engine participation in averaging, banking or trading programs (ABT) of any oxides of nitrogen (NO_x) or carbon dioxide (CO₂), as applicable, is not allowed when applying for certification using the ITR, and that an engine ceases to be eligible for the provisions of the ITR if the engine's emission levels are no longer surplus to existing regulatory requirements. This ensures that an engine family receiving this regulation's certification flexibility is cleaner than what a manufacturer would have been required to produce anyway, and is needed to help ensure that, as intended, the regulation reduces NO_x or CO₂ emissions, as applicable.

Section 2208.1(b): Certification Flexibility for Early Introduction of Low-NO_x Engines

Summary and Rationale for Section 2208.1 (b)(1)(A) and (B)

This section identifies the criteria and timelines for spark-ignition and compression-ignition engines meeting an optional low-NO_x emission standard to be eligible for the ITR. This is needed to allow engine manufacturers wishing to receive certification flexibility pursuant to the ITR to effectively plan for development and certification of such engines under the ITR.

Summary and Rationale for Section 2208.1 (b)(2)

This section indicates that a manufacturer that meets the ITR's eligibility criteria for a low-NO_x engine is eligible for the ITR's low-NO_x engine certification flexibility. This is needed to allow engine manufacturers wishing to receive certification flexibility for low-NO_x engines pursuant to the ITR to effectively plan for development and certification of such engines under the ITR.

Summary and Rationale for Section 2208.1 (b)(2)(A)

This section indicates that a manufacturer would be eligible to use an assigned engine deterioration factor (DF) when applying to ARB for certification of an eligible low-NOx engine family, rather than demonstrate emission compliance with an aged engine. This is needed to meet the objectives of the ITR, that is, to reduce potential certification costs, thereby encouraging engine manufacturers to develop and certify low-NOx engines sooner than might otherwise occur. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (b)(2)(B)

This section identifies the OBD compliance flexibility for which a manufacturer would be eligible when applying to ARB for certification of an eligible low-NOx engine family under the ITR, as well as the existing OBD regulations with which a manufacturer must continue to comply. This is needed to meet the objectives of the ITR, that is, to reduce certification costs and engineering challenges, thereby encouraging engine manufacturers to develop and certify low-NOx engines sooner than might otherwise occur, while still maintaining critical functionality of these engine's OBD systems. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing OBD regulations.

Summary and Rationale for Section 2208.1 (b)(2)(B)(1)

This section provides flexibility regarding how many demonstration engines a manufacturer is required to test each year for OBD compliance if low-NOx engine families are produced. This is needed to meet the objectives of the ITR, that is, to reduce potential certification costs, thereby encouraging engine manufacturers to develop and certify low-NOx engines sooner than might otherwise occur, while maintaining robust functionality of these engine's OBD systems. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (b)(2)(B)(2)

This section identifies the number of production vehicles from which OBD data must be reported to ARB by a manufacturer of an eligible low-NOx engine, as well as when that information must be reported. This is needed to meet the objectives of the ITR, that is, to reduce potential certification costs, thereby encouraging engine manufacturers to develop and certify low-NOx engines sooner than might otherwise occur, while maintaining robust functionality of these engine's OBD systems. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (b)(2)(B)(3)

This section provides that up to four allowable OBD deficiencies related to specified low-NOx technology would not be counted when determining the number of deficiencies subject to fines under California Code of Regulations, title 13, section 1971.5,

subdivision (d)(3)(A)(ii). This is needed in consideration of potential challenges in developing fully-compliant OBD systems for low-NOx engines, and to help reduce the potential cost of certification, while maintaining robust functionality of these engine's OBD systems. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (b)(2)(B)(4)

This section would increase the emission threshold at which the performance of major OBD monitors would need to indicate a malfunction or otherwise trigger a recall of the engine. This is needed to reduce the potential risk of applying for certification of a new technology, thereby encouraging engine manufacturers to develop and certify low-NOx engines sooner than might otherwise occur. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (b)(3)(A)

This section defines the eligibility criteria for an alternate flexibility path, in which a manufacturer of two eligible low-NOx engines in a given MY may receive greater OBD compliance flexibility for one low-NOx engine family if the manufacturer refrains from using the ITR's certification flexibility for the other engine family. This is needed to further accelerate deployment of low-NOx engines by providing another option for a manufacturer wishing to launch two low-NOx engines in a single MY.

Summary and Rationale for Section 2208.1 (b)(3)(B)

This section indicates that the two eligible low-NOx engine families participating in the ITR pursuant to Section 2208.1(b)(3)(A) are ineligible to participate in NOx emission averaging, banking, and trading (ABT) for three MYs. This is needed to help ensure deployment of these engines achieves NOx emission reductions beyond what would otherwise have occurred. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with existing law.

Summary and Rationale for Section 2208.1 (b)(3)(C)

This section identifies the greater OBD flexibility for which one of the low-NOx engine families receiving certification flexibility pursuant to section 2208.1(c)(3) is eligible, and describes labeling requirements for such engine family. The certification flexibility description is needed to describe what would be required of a participating low-NOx engine, while labeling requirements are needed to alert diagnostic technicians and enforcement personnel to the OBD functionality of the engine. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (b)(3)(D)

This section indicates the eligibility sunset date for a low-NOx engine that may receive one year of greater OBD compliance flexibility pursuant to section 2208.1(b)(3)(A). This is needed to convey eligibility criteria for this element of the regulation to potential low-

NOx engine manufacturers, to allow engine manufacturers wishing to receive certification flexibility pursuant to the ITR to effectively plan for development and certification of such engines under the ITR.

Section 2208.1(c): Certification Flexibility for Early Introduction of Heavy-Duty Hybrids

Summary and Rationale for Section 2208.1 (c)(1)(A)(1) and (2)

These sections indicate that a heavy-duty engine certified for use in a hybrid vehicle (hybrid engine) that achieves less than 35 miles all-electric range (AER) is eligible for Tier 1 certification flexibility for up to two MYs, or through MY 2021, whichever comes first, and then for a subsequent Tier 2 certification flexibility for up to two MYs, or through the 2024 MY, whichever comes first. This is needed to allow heavy-duty engine, drivetrain and vehicle manufacturers wishing to receive certification flexibility pursuant to the ITR to effectively plan for development and certification of such engines, with an emphasis on encouraging robust heavy-duty hybrids that have significant zero-emission capability.

Summary and Rationale for Section 2208.1 (c)(1)(A)(3)

This section indicates that a hybrid engine family to be installed on a transit bus that does not achieve at least 35 miles AER is ineligible for the ITR. This is needed because the transit bus sector is embracing advanced technologies – including hybrid and zero-emission technology – faster than other heavy-duty sectors, in part due to availability of federal transit bus funding. Hybrid transit bus engines are therefore less in need of the proposed ITR's certification flexibility in order to be deployed in significant numbers. As such, the ITR's certification flexibility is limited to the most needed advanced hybrids (i.e., hybrids with significant AER).

Summary and Rationale for Section 2208.1 (c)(1)(B)

This section indicates that a hybrid engine that achieves at least 35 miles AER is eligible for Tier 1 certification flexibility for up to four MYs, or through MY 2024, whichever comes first,, followed by Tier 2 certification flexibility for up to two MYs, or through the 2024 MY, whichever comes first. This longer eligibility timeline, relative to hybrids without 35 miles AER capability, is needed to further encourage technology that operates with zero-emissions for a significant portion of typical hybrid truck or bus operation, and to enable development and fleet acceptance of zero-emission technology.

Summary and Rationale for Section 2208.1 (c)(1)(C)

This section indicates that in order for a hybrid engine to be eligible for the ITR's certification flexibility provisions, it must demonstrate no increase in NOx, CO, or HC emissions, and at least a ten percent CO₂ emission reduction, pursuant to the ITR's emission test procedures. The NOx, CO, and HC emission criteria are needed to ensure that adding a hybrid system to a previously-certified engine will not increase the engine's in-use NOx, CO, and HC emissions. The CO₂ reduction threshold is needed

to ensure a minimum greenhouse gas emission benefit from the engine and hybrid driveline-combination of hybrid engines receiving certification flexibility under the ITR.

Summary and Rationale for Section 2208.1 (c)(2)(A)(1)

This section indicates that the Tier 1 certification process under the ITR would allow a hybrid engine manufacturer to use an assigned engine DF when applying to ARB for certification of an eligible hybrid engine family, rather than requiring the manufacturer to demonstrate emission compliance of an aged engine. This is needed to meet the objectives of the ITR, that is, to reduce potential certification costs, thereby encouraging engine manufacturers to develop and certify hybrid engines sooner than might otherwise occur. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(2)(A)(2)

This section indicates that the Tier 1 certification process under the ITR would allow a hybrid engine manufacturer to implement an Engine Manufacturer Diagnostics (EMD) system pursuant to California Code of Regulations, title 13, section 1971.1, subdivision (d)(7.1.4), in lieu of full heavy-duty engine OBD requirements. This is needed to meet the objectives of the ITR, that is, to help hybrid engine and driveline manufacturers overcome obstacles achieving full OBD compliance for a new, integrated hybrid and engine drivetrain combination, and thus encourage additional development and deployment of new heavy-duty hybrid engine offerings. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing OBD regulations.

Summary and Rationale for Section 2208.1 (c)(2)(A)(2)(a)

This section indicates that an engine family or a functionally equivalent engine family that already complies with an on-board diagnostic (OBD) certification provision, in the current or a previous MY, is ineligible for OBD flexibility pursuant to the ITR. This is needed to retain the emission benefits of OBD system compliance from manufacturers that do not need this regulation's OBD compliance flexibility to encourage them to enter the market. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing OBD regulations.

Summary and Rationale for Section 2208.1 (c)(2)(A)(2)(b)

This section indicates that an engine family ineligible for certification flexibility because it or a functionally equivalent engine family already demonstrates a level of OBD compliance is not subject to fines for OBD "deficiencies" that are not related to that existing OBD compliance, and that those "deficiencies" not related to that existing OBD compliance will not be counted in determining the engine family's number of allowable deficiencies, through the 2020 MY. This is needed to ensure the development of new technology and as a fairness provision, since an engine family that does not demonstrate such OBD compliance and therefore is eligible for the ITR OBD provisions would receive significant relief from such fines during its ITR eligibility period. This is

also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing OBD regulations.

Summary and Rationale for Section 2208.1 (c)(2)(A)(2)(c)

This section indicates that an engine family ineligible for ITR certification flexibility because it or a functionally equivalent engine family already demonstrates a level of OBD compliance is not subject to California Code of Regulations, title 13, section 1971.1(k)(4) requirements to annually apply and explain the need for the same deficiencies in the engine family's existing OBD system. This is needed to ensure the development of new technology and as a fairness provision, since an engine family that does not demonstrate such OBD compliance and therefore is eligible for the ITR OBD provisions would receive significant relief from addressing deficiencies during its ITR eligibility period. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing OBD regulations.

Summary and Rationale for Section 2208.1 (c)(2)(A)(3)

This section identifies Tier 1 labeling requirements for hybrid engines certified under this section, which are needed to alert diagnostic technicians and enforcement personnel as to the OBD functionality of the engine. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing OBD regulations.

Summary and Rationale for Section 2208.1 (c)(2)(A)(3)(a)

This section identifies the requirements for the durability of the supplemental label regarding environmental conditions. This is needed to ensure the label can withstand environmental conditions for the label's useful life.

Summary and Rationale for Section 2208.1 (c)(2)(B)(1)

This section indicates that the Tier 2 certification process under the ITR would allow a hybrid engine manufacturer to use an assigned engine DF when applying to ARB for certification of an eligible hybrid engine family, rather than demonstrate emission compliance of an aged engine. This is needed to meet the objectives of the ITR, that is, to encourage manufacturers of heavy-duty hybrid engines to certify such engines sooner than otherwise. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(2)(B)(2)

This section indicates that a hybrid engine certified under the Tier 2 process must meet existing heavy-duty engine OBD requirements, except as provided by Sections 2208.1(c)(1)(B)(2)(a) through (c). This is needed to define the OBD requirements for heavy-duty hybrid engines participating in the ITR, and to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(2)(B)(2)(a)

This section explains the flexibility regarding how a manufacturer's total number of hybrid engine families is calculated for the purposes of determining how many engine families for which a manufacturer has to provide OBD test data to ARB, such that certification of one hybrid engine family in a given MY would not trigger an increase in the number of engines for which manufacturers must provide detailed OBD functionality data to ARB. This section also clarifies that a hybrid engine that has previously been certified by ARB as meeting full OBD requirements as a non-hybrid engine, and that is certified to the same emission standards to which the non-hybrid engine was certified, is exempt from the requirement to conduct certain OBD testing. Further, this section states that changes made to the previously certified OBD system may invalidate this OBD flexibility, unless approved by the Executive Officer. These provisions are needed to address manufacturer concerns of the cost and engineering resources to comply with such a requirement, which may deter them from producing and certifying additional engine families, including hybrid engine families. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(2)(B)(2)(b)

This section sets forth the flexibility regarding what OBD information a manufacturer of an eligible hybrid engine is required to report to ARB from production engines, as well as how that information is reported. This is needed to address manufacturer concerns over such a requirement, which may deter them from producing and certifying additional engine families, including hybrid engine families. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(2)(B)(2)(c)

This section provides that up to three allowable OBD deficiencies related to the eligible hybrid technology would not be counted when determining the number of deficiencies subject to fines under California Code of Regulations, title 13, section 1971.5, subdivision (d)(3)(A)(ii). This is needed in consideration of potential challenges in developing fully-compliant OBD systems for hybrid engines, and to help reduce the cost of certification. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(3)(A)

This section indicates that ARB will issue, through the 2021 MY, if so requested by the certifying parties, a dual Executive Order (EO) that jointly identifies the engine, microturbine, or fuel cell manufacturer, and the hybrid driveline manufacturer as jointly responsible for complying with the terms of the EO. This is needed to address the risk perceived by hybrid engine and driveline manufacturers of being solely responsible for complying with the terms of the EO, thereby removing a potential barrier to their willingness to certify such engines.

Summary and Rationale for Section 2208.1 (c)(3)(B)

This section indicates that between the 2021 and 2024 MY, ARB will only issue a dual EO requested by the certifying parties if the hybrid engine and driveline combination demonstrate no increase in NO_x, CO, or HC emissions pursuant to this ITR's test procedures. This is needed to continue to address the risk perceived by hybrid engine and driveline manufacturers of being solely responsible for complying with the terms of the EO, thereby removing a potential barrier to their willingness to certify such engines while ensuring that these vehicles will not increase in-use emissions.

Summary and Rationale for Section 2208.1 (c)(3)(C)

This section indicates that ARB will only issue single EOs after the 2024 MY. This is needed to ensure that a single entity will eventually take full responsibility for certification of the engine and driveline combination, in order to enable better engine-driveline integration, and enforcement of emission, warranty, and other EO provisions, while providing time for the engine and driveline manufacturer collaboration needed to meet such requirements.

Summary and Rationale for Section 2208.1 (c)(3)(D)

This section indicates that a hybrid engine family is not required to otherwise participate in the ITR to be eligible for a dual EO pursuant to section 2208.1(c)(2). This is needed to clarify that manufacturers need not participate in section 2208.1(a) ("General Requirements") of the regulation to obtain a dual EO for a hybrid engine family. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(3)(E)

This section indicates that if the United States Environmental Protection Agency (U.S. EPA) provides a Certificate of Conformity that identifies one manufacturer as solely responsible for the engine, microturbine, or fuel cell and hybrid driveline combination, ARB reserves the right not to issue a dual EO for such an engine, microturbine, or fuel cell and hybrid driveline combination. This is needed to ensure that the terms of an engine's ARB EO are at least as stringent as the terms for that engine when federally certified.

Summary and Rationale for Section 2208.1 (c)(4)

This section indicates the criteria that need to be met by an engine originally certified by ARB as an off-road engine, or as part of a light- or medium-duty vehicle, for that engine to be considered for certification, through the 2024 MY, as a hybrid vehicle range extender. This is needed to detail which engines may be certified by ARB as hybrid vehicle range extenders, so as to allow engine manufacturers opting to receive certification of a hybrid vehicle range extender under the ITR to effectively plan for development and certification.

Summary and Rationale for Section 2208.1 (c)(4)(A)(1)

This section indicates that in order for an engine family applying for certification as a hybrid vehicle range extender to be certified pursuant to section 2208.1(c)(4), it must be

installed in a vehicle that achieves at least 35 miles AER. This is needed to limit eligibility to only the engines with the greatest opportunity to achieve near-term emission reductions, and to help enable development and fleet acceptance of zero-emission heavy-duty vehicle technology.

Summary and Rationale for Section 2208.1 (c)(4)(A)(2)

This section indicates that in order for an engine family applying for certification as a hybrid vehicle range extender to be certified pursuant to section 2208.1(c)(4), the engine must be electronically-controlled with a fully functional electronic control module (ECM). This is needed to ensure that the engine has the capability needed to eventually comply with OBD requirements pursuant to the ITR.

Summary and Rationale for Section 2208.1 (c)(4)(A)(3)

This section indicates that in order for an engine family applying for certification as a hybrid vehicle range extender to be certified pursuant to section 2208.1(c)(4), the engine must not be mechanically connected to the drivetrain, and must not be capable of directly propelling the vehicle in which it is installed. This is needed for the engine to operate with a specified, predictable duty-cycle, which is needed to help ensure achievement of emissions reductions from this heavy-duty engine technology.

Summary and Rationale for Section 2208.1 (c)(4)(A)(4)

This section indicates that in order for an engine family applying for certification as a hybrid engine range extender to be certified pursuant to section 2208.1(c)(4), the engine must be a newly manufactured engine. This is needed to ensure that used engines are not utilized in meeting the provisions of section 2208.1(c)(4).

Summary and Rationale for Section 2208.1 (c)(4)(A)(5)

This section indicates that in order for an engine family applying for certification as a hybrid engine range extender to be certified pursuant to section 2208.1(c)(4), it must be equipped with a diesel particulate filter if it is a diesel engine. This is needed to ensure the control of toxic diesel particulate matter (PM) from the engine.

Summary and Rationale for Section 2208.1 (c)(4)(A)(6)

This section indicates that in order for an engine family applying for certification as a hybrid engine range extender to be certified pursuant to section 2208.1(c)(4), the engine must be installed in a heavy-duty hybrid vehicle that is certified pursuant to the *California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric and Other Hybrid Vehicles, in the Urban Bus and Heavy-Duty Vehicle Classes* (December 2013). This is needed to ensure that the installation of the engine in a hybrid vehicle does not result in higher in-use emissions than is emitted by its non-hybrid counterpart.

Summary and Rationale for Section 2208.1 (c)(4)(B)

This section identifies how an engine originally certified for use in off-road equipment may be certified for use in an on-road heavy-duty hybrid vehicle. This is needed to provide clarity for certification, implementation, and enforcement purposes, and help

provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(4)(B)(1)

This section indicates that an engine must be identical in configuration to the engine certified to off-road standards pursuant to California Code of Regulations, title 13, sections 2403, 2423, or 2433, to be eligible to be certified pursuant to section 2208.1(c)(4) of the ITR. This is needed to ensure that an engine certified to such standards is not modified in a way that might increase emissions.

Summary and Rationale for Section 2208.1 (c)(4)(B)(2) and Section (c)(4)(C)(2)

These sections indicate that ARB will treat engines certified pursuant to section 2208.1(c)(4) as off-road engines for compliance purposes, including selective enforcement audits, in-use testing, defect reporting, and recall. These sections also indicate that these engines must comply with California Code of Regulations, title 13, sections 2403, 2423, or 2433. These are needed to define implementation of these procedures for the purposes of this regulation. These are also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(4)(B)(2)(a) and Section 2208.1(c)(4)(C)(2)(a)

These sections require that engines certified pursuant to section 2208.1(c)(4) must meet heavy-duty engine useful life requirements. These sections are needed to ensure durability of the engine and its emission controls and to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(4)(B)(2)(b) and Section 2208.1(c)(4)(C)(2)(b)

These sections require an engine certified pursuant to section 2208.1(c)(4) to be covered by a warranty for the minimum warranty period of the original off-road, light- or medium-duty engine, and requires that the warranty cover the engine when operated and properly maintained as intended in the on-road, hybrid heavy-duty vehicle. It also indicates that the owner's manual for the heavy-duty vehicle in which the engine is installed must include a listing of any required service and service intervals, and recommended maintenance practices, for the engine as used in its heavy-duty application. This is needed to protect consumers purchasing the hybrid heavy-duty vehicle, while defining their service and maintenance responsibilities.

Summary and Rationale for Section 2208.1 (c)(4)(B)(2)(c) and Section 2208.1(c)(4)(C)(2)(c)

These sections indicate that an engine family certified pursuant to section 2208.1(c)(4) must meet heavy-duty OBD requirements, but is eligible for the same OBD flexibility provided to heavy-duty hybrids that achieve at least 35 miles AER under the ITR. These sections indicate that a vehicle manufacturer may sell a maximum of 100 such

engines that have received Tier 1 flexibility per MY, or a maximum of 200 engines that have received Tier 2 flexibility or achieved full OBD compliance per MY. Furthermore, each vehicle manufacturer may not utilize an engine receiving Tier 1 flexibility for more than four MYs, and may not utilize such an engine for more than six MYs of Tier 1 and 2 OBD flexibility combined. These provisions are needed to help a manufacturer understand its eligible MYs and allowable OBD provisions under the ITR, while minimizing potential risk to ARB of certifying this non-traditional heavy-duty engine technology. These are also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(4)(B)(3)

This section requires an engine originally certified to off-road engine emission standards under California Code of Regulations, title 13, sections 2403, 2423 or 2433 to meet the most stringent applicable emission standards for NOx and PM for its MY, size, and classification, and indicates that such an engine may not be used in ABT programs. This is needed to ensure the engine achieves the maximum potential in-use emission reductions. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(4)(B)(4) and Section 2208.1(c)(4)(C)(3)

These sections require an engine manufacturer to have written assurance from the hybrid vehicle manufacturer that the hybrid vehicle manufacturer needs a certain number of exempted engines before shipping engines certified pursuant to section 2208.1(c)(4). These are needed to ensure coordination between the engine manufacturer and the hybrid vehicle manufacturer, and to ensure that the engine manufacturer is cognizant of the number of engines that need to be certified for heavy-duty use.

Summary and Rationale for Section 2208.1 (c)(4)(B)(5) and Section 2208.1(c)(4)(C)(4)

These sections identify supplemental labeling requirements for an engine certified pursuant to section 2208.1(c)(4). These are needed to identify the engine as a heavy-duty on-road engine, and to alert diagnostic technicians and enforcement personnel as to the diagnostic system functionality of the engine. These are also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (c)(4)(D)

This section requires a manufacturer to collect, and submit to ARB, specified data regarding the operation and effectiveness of an engine certified pursuant to section 2208.1(c)(4), and the vehicle in which such an engine is installed. This section also defines recordkeeping requirements for such data. This is needed to ensure ARB has access to such information, in order to inform potential updated certification requirements for this technology after the 2024 MY and for enforcement.

Section 2208.1 (d): High-Efficiency Heavy-Duty Engines

Summary and Rationale for Section 2208.1 (d)(1)

This section indicates that a manufacturer applying for certification of an engine family as meeting the specified optional low-CO₂ emission standards is eligible, through the 2027 MY, for up to six MYs of the same Tier 1 and Tier 2 certification flexibility provided to heavy-duty hybrids, with Tier 1 flexibility for no more than four of these six MYs. This is needed to allow engine manufacturers wishing to receive certification flexibility pursuant to the ITR to effectively plan for development and certification of such engines under the ITR. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (d)(1)(A)

This section indicates that Tier 2 flexibility for an engine family for which certification meeting the specified optional low-CO₂ emission standards is sought differs from that of hybrid engines in one respect: allowable deficiencies not subject to fines must be related to achievement of the low-CO₂ technology rather than to engine hybridization. This is needed in consideration of potential challenges in developing fully-compliant OBD systems for low- CO₂ engines, and to help reduce the potential cost of certification, while maintaining robust functionality of these engine's OBD systems. . This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing OBD regulations.

Summary and Rationale for Section 2208.1 (d)(1)(B)

This section indicates that a hybrid engine family meeting the optional low-CO₂ emission standard is ineligible for the provisions of section 2208.1(d). This is needed to help ensure that an engine meeting the optional low-CO₂ standards does not do so based upon the use of a hybrid driveline, which is addressed by section 2208.1(c) of the ITR. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

Summary and Rationale for Section 2208.1 (d)(2)

This section indicates that, for an engine meeting optional low-CO₂ standards, a manufacturer may sell up to 100 engines that receive Tier 1 certification flexibility and up to 200 engines receiving Tier 2 flexibility. This is needed to enable a manufacturer to certify and launch a more efficient, low-CO₂ technology, while defining a pathway to full OBD compliance.

**SECTION 2208.2: CALIFORNIA CERTIFICATION AND INSTALLATION
PROCEDURES FOR INNOVATIVE MEDIUM- AND HEAVY-DUTY VEHICLE HYBRID
CONVERSION SYSTEMS**

Summary and Rationale for Section 2208.2(a)

This section identifies the ARB-certification and installation procedures that apply to conversion of non-hybrid truck and bus engines and vehicles to operate as hybrids, and to which non-hybrid truck and bus engines and vehicles the procedures apply. This is needed to provide clarity regarding which procedures apply for ARB certification of a hybrid conversion system, and to help provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.

**AMENDMENTS TO TITLE 13, SECTION 1956.8: EXHAUST EMISSION
STANDARDS AND TEST PROCEDURES – 1985 AND SUBSEQUENT MODEL
HEAVY-DUTY ENGINES AND VEHICLES**

Summary and Rationale for Section 1956.8(a)(7)(A)

Section 1956.8(a)(7)(A) adds optional CO₂ emission standards for new 2014 and subsequent model heavy-duty diesel engines to the existing Section 1956.8 table. The addition of the optional emission standards to the table, and the addition of the new footnote E are needed to establish the proposed Optional Low-CO₂ Emission Standards for the ITR regulation, which would promote high-efficiency heavy-duty diesel engines that will emit lower CO₂ emissions. This language also explains how the amendments and ITR would work together.

Summary and Rationale for Section 1956.8(b)

Section 1956.8(b) incorporates by reference the test procedures used to determine compliance with the heavy-duty diesel engine emission standards. This subsection is modified to update the "last amended" date of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel-Engines and Vehicles," which is being modified as part of this rulemaking. The update is needed to ensure that the most up-to-date document is referenced for determining compliance with the emission standards.

Summary and Rationale for Section 1956.8(c)(4)(A)(1)

The new subsection 1956.8(c)(4)(A)(1) adds the new Optional Low-CO₂ Emission Standards for new heavy-duty Otto-cycle engines as an optional pathway for participating in the ITR. The addition of this subsection is needed to encourage manufacturers to produce high-efficiency heavy-duty Otto-cycle engines that will emit lower CO₂ emissions, and to show how the amendments and ITR would work together.

Summary and Rationale for Section 1956.8(d)

Section 1956.8(d) incorporates by reference the test procedures to determine compliance with heavy-duty Otto-cycle engine emission standards. This subsection is

modified to update the “last amended” date of the “California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles,” which is being modified as part of this rulemaking. The update is needed to ensure that the most up-to-date document is referenced for determining compliance with the emission standards.

AMENDMENTS TO CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 2004 AND SUBSEQUENT MODEL HEAVY-DUTY DIESEL ENGINES AND VEHICLES

Summary and Rationale for Section 1036.108 Greenhouse gas emission standards

This section specifies the CO₂, nitrous oxide, and methane emission standards for heavy-duty engines. The changes to this section establish the Optional Low-CO₂ Emission Standards as an optional pathway for heavy-duty diesel engines to participate in the ITR, and are needed to promote high-efficiency engines that will emit lower CO₂ emissions. This language also explains how the amendments and ITR would work together.

Summary and Rationale for Section 1036.701 General provisions

This section describes the provisions for the averaging, banking, and trading of emission credits for certification. The modification prohibits heavy-duty diesel engines certified to the Optional Low-CO₂ Emission Standards from participating in the averaging, banking, and trading provisions of the subpart. This is needed to ensure that high-efficiency engines certified to the Optional Low-CO₂ Emission Standards will not generate surplus emission credits while benefiting from ITR flexibilities. This language also explains how the amendments and ITR would work together.

AMENDMENTS TO CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 2004 AND SUBSEQUENT MODEL HEAVY-DUTY OTTO-CYCLE ENGINES

Summary and Rationale for Section 1036.108 Greenhouse gas emission standards

This section specifies the CO₂, nitrous oxide, and methane emission standards for heavy-duty engines. The changes to this section establish the Optional Low-CO₂ Emission Standards as an optional pathway for heavy-duty Otto-cycle engines to participate in the ITR, and are needed to promote high-efficiency engines that will emit lower CO₂ emissions. This language also explains how the amendments and ITR would work together.

Summary and Rationale for Section 1036.701 General provisions

This section describes the provisions for the averaging, banking, and trading of emission credits for certification. The modification prohibits heavy-duty Otto-cycle engines certified to the Optional Low-CO₂ Emission Standards from participating in the averaging, banking, and trading provisions of the subpart. This is needed to ensure that high-efficiency engines certified to the Optional Low-CO₂ Emission Standards will not

generate surplus emission credits while benefiting from ITR flexibilities. This language also explains how the amendments and ITR would work together.

**CALIFORNIA CERTIFICATION AND INSTALLATION PROCEDURES FOR
MEDIUM- AND HEAVY-DUTY VEHICLE HYBRID CONVERSION SYSTEMS
(certification procedures)**

Summary and Rationale for Section 1(a)

This section identifies the hybrid conversion system technologies and allowable base engines and vehicles that are subject to the certification procedures. This section is needed to identify the hybrid conversion systems and allowable base vehicles and engines that must follow the certification procedures to be approved for California sale or installation, so engine manufacturers wishing to receive certification flexibility for engines pursuant to the procedures can effectively plan for development and certification of such engines.

Summary and Rationale for Section 1(b)

This section provides that certification of a hybrid conversation system under these procedures is considered a certification under Health and Safety Code section 43006 and operates as an exemption under Vehicle Code Section 27156. This is needed to help provide manufacturers with an understanding of how the proposed ITR would work together with existing law.

Summary and Rationale for Section 2

This section defines the terms, and outlines the acronyms, used in the certification procedures. It is necessary that ARB defines terms used in the ITR, so that regulated persons and entities can understand what they are reading.

Summary and Rationale for Section 3(a)

This section indicates that a hybrid conversion system must achieve at least a ten percent reduction in CO₂ emissions, and no increase in NO_x, HC, CO, PM or evaporative emissions in order to be eligible for certification, and that the Executive Officer may conduct independent emission testing of such a system to validate achievement of such criteria. This is needed to define the emission criteria necessary for certification, and enables ARB to evaluate and enforce achievement of these criteria.

Summary and Rationale for Section 3(b)

This section identifies requirements for a supplemental emission control label for the hybrid conversion system, including requirements for label visibility, durability, and content. This is needed to ensure that the hybrid conversion system is equipped with a label that will convey to diagnostic technicians and enforcement personnel that the base engine or vehicle has been converted and may meet alternate diagnostic and other requirements, pursuant to the ITR. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with existing ARB regulations.

Summary and Rationale for Section 3(c)

This section indicates that the drivability of a base vehicle equipped with a hybrid conversion system must not be degraded in such a way as to encourage consumer tampering or create a safety hazard. This is needed to ensure the conversion does not encourage consumers to alter the conversion systems in a way that could increase emissions or create a safety hazard.

Summary and Rationale for Section 3(d)

This section indicates that a hybrid conversion system shall be required to meet more stringent emission, OBD, warranty or other requirements than those identified in the certification procedures if the system meets such more stringent federal requirements when it the manufacturer is applying to ARB for certification of the system. This is needed to ensure the conversion system meets at least as stringent requirements in California as it meets when certified nationally, in order to maximize the potential emission benefits from a system that is capable of meeting more stringent requirements.

Summary and Rationale for Section 3(e)

This section identifies the requirements for what must be included in an owner's manual that the conversion system manufacturer must provide to the purchaser of each hybrid conversion system. This is needed to ensure each purchaser has the necessary information regarding safe operation, maintenance, and repair of the hybrid conversion system.

Summary and Rationale for Section 3(f)

This section requires that the conversion system manufacturer have a written contractual relationship with installers of its system, identify how its hybrid conversion system is to be installed, and requires the manufacturer to provide a copy of such contract and installation information to ARB within 30 days, upon request. These requirements are needed to ensure and enforce proper installation of the hybrid conversion system.

Summary and Rationale for Section 3(g)

This section requires that a manufacturer disclose in writing, when applying for incentive funding for a Tier 1 or Tier 2 certified hybrid conversion system, whether the volume of conversion systems or converted vehicles for which it is applying for funding exceeds the conversion system's applicable Tier 1 or 2 California sales volume limit under the ITR. This is needed to ensure full disclosure to funding agencies regarding the certification status and funding eligibility of a Tier 1- or Tier 2-certified conversion system, to ensure that public funding is not spent on conversion systems that may not be legally sold.

Summary and Rationale for Section 3(h)

This section requires the manufacturer to provide written information to system dealers and purchasers regarding proper disposal of the hybrid conversion system battery, and provide a copy of such written information to ARB. This is needed to ensure that the

battery will be disposed of in a safe and environmentally friendly manner at the end of its useful life.

Summary and Rationale for Section 4(a)

This section identifies the requirements of Tier 1 certification for a hybrid conversion system. Tier 1 certification, with more flexible emission, diagnostic, and other requirements, is needed to provide a greater opportunity for robust hybrid conversion systems to enter the California market.

Summary and Rationale for Section 4(a)(1)

This section requires that conversion system manufacturers provide an engineering evaluation to ARB demonstrating that its conversion system will meet the exhaust emission criteria of the certification procedures. This is needed to provide reasonable assurance that the conversion system will provide a minimum anticipated CO₂ emission benefit and will not increase criteria pollutant exhaust emissions.

Summary and Rationale for Section 4(a)(2)

This section indicates the testing mechanisms by which the conversion system for light- or medium-duty vehicles must demonstrate no increase in evaporative emissions from its original base vehicle's certified configuration. A heavy-duty engine, compression-ignition engine, or engine with sealed fuel system would have the opportunity to be exempt from such testing if the manufacturer provides an engineering evaluation demonstrating to the Executive Officer that the engine does not increase evaporative emissions. These criteria are needed to ensure that the conversion system does not increase evaporative emissions from the base engine or vehicle, while providing potential compliance flexibility (and cost savings) to manufacturers of conversion systems for engines that are likely to have inherently low, or no, evaporative emissions, which will encourage development of the needed technology.

Summary and Rationale for Sections 4(b) and 4(c)

Sections 4(b) and 4(c) indicate that each manufacturer may sell up to ten Tier 1-certified hybrid conversion systems that do not achieve at least 35 miles AER, and up to 25 Tier 1-certified hybrid conversion systems that do achieve at least 35 miles AER. These sections also define the allowable Tier 1 sales volumes and sunset dates of the opportunity for a manufacturer to apply for Tier 1 certification, and for a Tier 1-certified system to be installed or sold. This is needed to provide certainty to manufacturers regarding their ability to apply for certification of Tier 1 conversion systems, and to sell or have such systems installed. This is also needed to provide ARB certainty regarding the potential sales volume and timeframe that systems meeting less stringent Tier 1 certification requirements may be sold.

Summary and Rationale for Section 4(d)

Section 4(d) identifies reporting requirements for manufacturers regarding each Tier 1-certified hybrid conversion system installed and sold. This is necessary to enable ARB to effectively ensure that the number of Tier 1 systems sold and installed falls within

allowable limits and to better enforce, if necessary, the warranty, recall, and other provisions of these certification procedures.

Summary and Rationale for Section 4(e)

Section 4(e) indicates that an engine or vehicle converted with a Tier 1-certified system must continue to comply with the original vehicle or engine OBD requirements, and indicates the exceptions to those requirements in the remainder of Section 4(e). This is needed to define the baseline Tier 1 diagnostic requirements, to meet the objectives of the ITR to reduce certification costs and engineering challenges, thereby encouraging engine manufacturers to develop and certify these systems sooner than might otherwise occur, while still maintaining critical functionality of these engine's OBD systems. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with existing ARB regulations.

Summary and Rationale for Section 4(e)(1)

This section identifies that a hybrid conversion system would meet Tier 1 certification requirements if the diagnostic system's IUMPR performance is below that of the unconverted vehicle's performance. This is necessary to meet the objectives of the ITR to provide conversion manufacturers with limited compliance flexibility for hybrid conversion vehicles from vehicle segments that are generally not available in the marketplace today, thereby encouraging engine manufacturers to develop and certify these systems sooner than might otherwise occur, while ensuring that these vehicle's diagnostic systems have the capability to detect the most emission-critical malfunctions.

Summary and Rationale for Section 4(e)(2)

This section identifies the hybrid system diagnostic link connector (HSDLC) requirements that the conversion manufacturer must comply with to receive Tier 1 certification from ARB. This is necessary to constrain the location of the HSDLC so that a technician can readily locate it on the vehicle, and to ensure that if an HSDLC is used on the conversion system, it can be readily distinguished from the base engine or vehicle's OBD system diagnostic link connector.

Summary and Rationale for Section 4(e)(3)

This section identifies the in-use monitoring performance criteria for hybrid conversion systems to comply with Tier 1 certification requirements. This section is necessary to provide manufacturers with the flexibility to produce hybrid conversion systems for vehicles that are not generally available in the marketplace today, thereby encouraging engine manufacturers to develop and certify these systems sooner than might otherwise occur, while ensuring that these vehicle's diagnostic systems have the capability to detect the most emission-critical malfunctions. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with existing ARB regulations.

Summary and Rationale for Sections 4(e)(4), 5(f)(3), and 6(e)(4)

These sections identify the OBD requirements that the conversion manufacturer must meet if the hybrid conversion requires modifications to a previously certified HD OBD or

OBD II certified engine or vehicle that may impact the OBD system's performance, and the revalidation testing that may be necessary. This is necessary to provide manufacturers with the flexibility to produce hybrid conversions of vehicles that are not generally available in the marketplace today, while ensuring that the original vehicle or engine's OBD performance is maintained after the hybrid conversion is completed.

Summary and Rationale for Section 4(e)(5)

This section provides flexibility regarding the number of production vehicles from which OBD data must be reported to ARB by a manufacturer of an eligible hybrid conversion vehicle, as well as when that information has to be reported. This is needed to address conversion manufacturer concerns that such a requirement may deter them from producing and certifying additional engine families, including hybrid engine families the ITR seeks to encourage. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with existing ARB regulations.

Summary and Rationale for Section 5(a)

This section requires that a Tier 2 certified hybrid conversion system demonstrate compliance with exhaust emission criteria pursuant to the emission test procedures identified in Section 7, and with evaporative emissions criteria of the Tier 1 certification procedures. This is needed to ensure evaporative and exhaust emissions do not increase due to installation of the hybrid conversion system.

Summary and Rationale for Sections 5(b) and 5(c)

Sections 5(b) and 5(c) indicate that each manufacturer may sell up to 500 Tier 2-certified hybrid conversion systems that do not achieve at least 35 miles AER, and up to 1,000 Tier 2-certified hybrid conversion systems that do achieve at least 35 miles AER. These sections also define the sunset dates for manufacturers to apply for certification of systems, and for system sales and installation. This is needed to provide certainty to manufacturers regarding their ability to apply for certification of Tier 2 conversion systems, and to sell or have such systems installed. This is also needed to provide ARB certainty regarding the potential sales volume and timeframe that systems meeting Tier 2 certification requirements, which are not as stringent as Tier 3/Final requirements, may be sold.

Summary and Rationale for Section 5(d)

Section 5(d) stipulates that a hybrid conversion system is not required to receive Tier 1 certification to be eligible for Tier 2 certification. This section is needed to clarify that a manufacturer can sell Tier 2 volumes of a hybrid conversion system that meets Tier 2 requirements and have them installed without having to first demonstrate Tier 1 compliance. Enabling a manufacturer to initially apply for Tier 2 certification streamlines the process for those manufacturers that are not reliant upon Tier 1 certification flexibility.

Summary and Rationale for Section 5(e)

Section 5(e) identifies requirements for manufacturer reporting to ARB regarding each unit of a Tier 1 and Tier 2 certified hybrid conversion system installed and sold. This is necessary to enable ARB to effectively ensure that the number of Tier 1 and Tier 2 systems sold and installed fall within allowable limits and to better enforce, if necessary, the warranty, recall, and other provisions of these certification procedures.

Summary and Rationale for Section 5(f)

Section 5(f) indicates that a Tier 2-certified system must comply with all Tier 1 diagnostic requirements, plus additional diagnostic requirements indicated in the remainder of Section 5(f). This is needed to define the baseline Tier 2 diagnostic requirements, thereby providing manufacturers with the flexibility to produce hybrid conversions of vehicles that are not generally available in the marketplace today, while ensuring that these system's diagnostic systems have the capability to detect the most emission-critical malfunctions.

Summary and Rationale for Section 5(f)(1)

This section identifies the diagnostic system requirements the conversion manufacturer must meet for a hybrid conversion system to receive Tier 2 certification from ARB. The section also requires the conversion manufacturer to determine the necessary improvements it must undertake if the converted vehicle's diagnostic system does not meet the minimum IUMPR values required in these procedures. This is necessary to ensure that the hybrid conversion manufacturer recognizes the improvements that will be required to meet the IUMPR requirements for Tier 3 certification. This is necessary to provide manufacturers with the flexibility to produce hybrid conversions of vehicles that are not generally available in the marketplace today, while ensuring that manufacturers are striving to develop systems that are eventually able to meet more stringent diagnostic requirements.

Summary and Rationale for Section 5(f)(2)

This section identifies the diagnostic system readiness requirements the conversion manufacturer must meet for a hybrid conversion system to receive Tier 2 certification from ARB. This is necessary to ensure that the OBD system's monitors are not adversely affected by the conversion system, such that all major monitors can run and complete without false malfunction detections. This performance capability is essential for passing an inspection and maintenance test, as well as for ensuring that these system's diagnostic systems have the capability to detect the most emission-critical malfunctions.

Summary and Rationale for Section 5(f)(4)

Section 5(f)(4) indicates that an engine or vehicle converted with a Tier 2-certified system must continue to comply with the original vehicle or engine OBD requirements, and indicates the exceptions to those requirements in the remainder of Section 5(f)(4). This is needed to define the baseline Tier 2 diagnostic requirements, to meet the objectives of the ITR, that is, to reduce certification costs and engineering challenges, thereby encouraging engine manufacturers to develop and certify these systems sooner

than might otherwise occur, while still maintaining critical functionality of these engine's OBD systems. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with existing ARB regulations.

Summary and Rationale for Section 5(f)(4)(A)

This section identifies the test vehicle selection procedure for the OBD system demonstration testing that the conversion manufacturer must meet for Tier 2 certification. This is necessary to ensure that the test vehicle selection process is similar and standardized for all conversion manufacturers in a manner that is likely to provide consistent and repeatable test results that is representative of the conversion system's performance.

Summary and Rationale for Section 5(f)(4)(B)

This section identifies the maximum number of OBD monitors that is required to be tested by hybrid conversion system manufacturers, and describes the monitor selection process that must be followed by these manufacturers to receive Tier 2 certification of their vehicles. This is necessary to provide assurance that OBD monitors for major emission controls still perform similarly to the original unconverted vehicle's OBD monitors.

Summary and Rationale for Sections 5(f)(4)(C) and 6(e)(5)(C)

These sections identify the testing protocol and procedures that must be followed by hybrid conversion system manufacturers for the OBD system demonstration testing for Tier 2 certification. This is necessary to provide manufacturers with a standardized and repeatable process to follow to avoid inefficiencies, such as unnecessary retesting.

Summary and Rationale for Sections 5(f)(5) and 5(f)(5)(A)

These sections identify the production engine or vehicle evaluation testing that is required for hybrid conversion manufacturers to receive Tier 2 certification of their vehicles, including for carryover approved Tier 1 systems. This is needed to provide minimum assurance that the hybrid conversion vehicles' OBD system can perform adequately to be included in an inspection and maintenance program.

Summary and Rationale for Section 5(f)(5)(B)

This section identifies the process and procedure that hybrid conversion manufacturers must follow for conducting testing to obtain and reporting OBD monitoring performance data from in-use production vehicles, which is required to maintain the Tier 2 certification approval status of their hybrid conversion vehicles. This is needed to provide assurance that the OBD systems on hybrid conversion systems that sell in higher numbers will have acceptable performance during in-use operation. This is also needed to help provide manufacturers with an understanding of how the proposed ITR would work together with existing ARB regulations.

Summary and Rationale for Section 6(a)

This section identifies the requirements a hybrid conversion system must meet to receive Tier 3 certification from ARB. Tier 3 certification requires compliance with the most rigorous emission, diagnostic, and other requirements, and does not include a California sales or installation limitation.

Summary and Rationale for Section 6(a)

This section requires that a Tier 3-certified hybrid conversion system demonstrate compliance with exhaust emission criteria pursuant to the emission test procedures identified in Section 7, and with evaporative emission criteria pursuant to Tier 1 certification procedures. This is needed to ensure evaporative and exhaust emissions do not increase due to installation of the hybrid conversion system.

Summary and Rationale for Section 6(b)

This section indicates that a manufacturer must demonstrate hybrid conversion system compliance with the requirements of Section 3 and Section 6 of the certification procedures for the system to receive a Tier 3 certification. This is needed to help define hybrid conversion system Tier 3 certification requirements.

Summary and Rationale for Section 6(c)

Section 6(c) stipulates that a hybrid conversion system is not required to receive Tier 1 or Tier 2 certification to be eligible for Tier 3 certification. This section is needed to simplify the certification process by enabling a conversion system that already complies with Tier 3 certification requirements to avoid being subject to Tier 1 and 2 sales and installation volume limitations, to allow for manufacturers to bring systems that comply with the most stringent standards to market as early as possible.

Summary and Rationale for Section 6(d)

Section 6(d) requires a manufacturer to report to ARB, as part of its Tier 3 certification application, specified information regarding each of its Tiers 1- and Tier 2-certified hybrid conversion systems installed and sold. This is necessary to enable ARB to effectively ensure that the number of Tier 1 and Tier 2 systems sold and installed fall within allowable limits, and to better enforce, if necessary, the warranty, recall, and other provisions of these certification procedures.

Summary and Rationale for Section 6(e)

Section 6(e) indicates that a Tier 2 certified system must comply with all Tier 2 diagnostic requirements, plus additional diagnostic requirements indicated in the remainder of Section 6(e). This is needed to define the baseline Tier 3 diagnostic requirements, thereby providing manufacturers with the flexibility to produce hybrid conversions of vehicles that are not generally available in the marketplace today, while ensuring that these system's diagnostic systems have the capability to detect the most emission-critical malfunctions.

Summary and Rationale for Section 6(e)(1)

This section identifies the OBD requirements for added hybrid components and systems that the conversion manufacturer must meet for a Tier 3 hybrid conversion system to be

certified in California. This is necessary to ensure the hybrid conversion system performs as designed, including achieving the expected emission reductions, for the life of the vehicle.

Summary and Rationale for Section 6(e)(2)

This section defines the conditions that must be met for OBD system monitors on the hybrid conversion vehicle for Tier 3 certification approval. This is necessary to ensure the hybrid conversion vehicle performs as designed, including achieving the expected emission reductions, for the life of the vehicle, and meets more standard OBD requirements, preparing it for full commercialization and certification under the existing OBD regulations.

Summary and Rationale for Section 6(e)(3)

This section identifies the hybrid system diagnostic link connector (HSDLC) requirements that the conversion manufacturer must comply with to receive Tier 3 certification approval from ARB. This is necessary to constrain the location of the HSDLC so that a technician can readily locate it on the vehicle, and to ensure that if an HSDLC is used on the conversion system, it can be readily distinguished from the base engine or vehicle's OBD system diagnostic link connector.

Summary and Rationale for Section 6(e)(5)

This section identifies the OBD system demonstration requirements that the conversion manufacturer must meet for Tier 3 certification approval. This is necessary to ensure that the hybrid conversion's diagnostic system performs similarly to the original vehicle's diagnostic system.

Summary and Rationale for Sections 6(e)(5)(A) and 6(e)(5)(B)

These sections identify the type and number of OBD monitors that are required to be tested by hybrid conversion system manufacturers, and describe the monitor selection process that must be followed by these manufacturers to receive Tier 3 certification approval. These are necessary to provide assurance that OBD monitors for major emission controls still perform similarly to the original unconverted vehicle's OBD monitors.

Summary and Rationale for Section 6(e)(6)

This section identifies the process and procedure that hybrid conversion manufacturers must follow for testing and obtaining OBD monitoring performance data from in-use production vehicles that is required for Tier 3 certification approval of their hybrid conversion vehicles. This is needed to provide assurance that the OBD systems on hybrid conversion systems will have acceptable performance during in-use operation.

Summary and Rationale for Section 7(a)

This section indicates which parts of Section 7 apply to exhaust emission testing of vehicles between 6,001 and 14,000 pounds GVWR, vehicles over 14,000 pounds GVWR, and compression-ignition engines, and describes potential flexibility for a manufacturer to conduct an engineering evaluation of its conversion system's PM, CO,

and HC emissions in lieu of emission testing. This is needed to define which emission test procedures apply to which class of hybrid vehicle technology, to allow engine manufacturers wishing to receive certification of a system under the ITR to effectively plan for development and certification. Potential flexibility to provide an engineering evaluation of PM, CO, and HC emissions is needed to provide compliance cost savings to manufacturers, while still providing ARB assurance that emissions that are inherently low and unlikely to increase due to engine hybridization, if applicable.

Summary and Rationale for Section 7(b)

This section indicates that a manufacturer must submit, as part of its application for Tier 2 or Tier 3 certification, a Hybrid Technology Emission Test Plan that details how it proposes to conduct required exhaust emission testing pursuant to Section 7 of the certification procedures, and lays out what the Plan must include. This is needed to provide certainty regarding acceptable emission test parameters to both ARB and the manufacturer prior to the commencement of testing, given the many potential iterations of hybrid and base vehicle technology to be tested and diversity of potential test routes and duty cycles that may represent the in-use activity of such technologies.

Summary and Rationale for Section 7(c)

This section identifies the allowable test procedures for vehicles conducting portable emission measurement system (PEMS) testing for the purposes of demonstrating compliance with the ITR's emission criteria. This is needed to provide manufacturers with a more economical method for demonstrating emission compliance than use of a heavy-duty vehicle chassis dynamometer, which helps achieve the purpose of the ITR.

Summary and Rationale for Section 7(c)(1)

This section identifies the minimum requirements for selection of hybrid and base vehicles that are emission tested pursuant to Section 7(c). This is needed to ensure that: 1) the hybrid and base vehicle mileage, test weight, and pre-conditioning are standardized, or are otherwise sufficiently similar to each other that emission differences during testing can be attributed to the hybrid system and not to other non-relevant parameters, and 2) the parameters are representative of the hybridized vehicle as it is anticipated to operate in-use.

Summary and Rationale for Section 7(c)(2)(A)

This section identifies thresholds for specific metrics the manufacturer should use when selecting two test routes to be used for PEMS testing – a transient-like route and a high-speed route. The section further requires that the hybrid and base vehicle must complete at least four valid runs over each of the two selected test routes. This is needed to define a route that is representative of how hybrid vehicles typically operate in-use, to ensure resulting emission data will reflect typical real-world operation, and so that the systems certified are those which do not increase certain emissions.

Summary and Rationale for Section 7(c)(2)(B)

This section requires a manufacturer, when PEMS testing, to indicate what percent of the time vehicles as driven over the proposed test route are anticipated to operate at

zero miles per hour. This is needed to define the test route, since time operation at zero miles per hour is not captured by the other required variables (i.e., average driving speed and positive kinetic energy) and can vary significantly by vehicle class and vocation.

Summary and Rationale for Section 7(c)(2)(C)

This section identifies the minimum duration and the maximum allowable average grade for an over-the-road test route for PEMS tests. The minimum test route duration is needed to ensure collection of sufficient emission data, and the maximum allowable average grade is needed to ensure the route grade is representative of typical California roads.

Summary and Rationale for Section 7(c)(2)(D)

This section indicates that the proposed PEMS test route must be a closed loop. This is needed to ensure no net elevation change over the course of the route.

Summary and Rationale for Section 7(c)(2)(E)

This section indicates that if a hybrid vehicle is incapable, due to a speed limiter, of operating at 55 miles per hour (mph), as required by the test procedures, that it may instead operate at its maximum operational speed. This is needed to address hybrid vehicles that may be physically incapable of meeting one of the PEMS emission test requirements, while maintaining the ability to reliably measure emissions from such vehicles.

Summary and Rationale for Section 7(c)(2)(F)

This section indicates the required pavement type and maximum elevation for test routes, needed to ensure the pavement type and elevation are representative of California roadways. This section also provides guidance regarding how to maximize consistent driving between test runs. This is needed to ensure more consistent operation of vehicles over selected test routes, so that emission results reflect the addition of hybrid technology rather than different driving behavior.

Summary and Rationale for Section 7(c)(2)(G)

This section indicates that a manufacturer must respect all local, state, and federal traffic- and safety-related requirements during PEMS testing. This is needed to help ensure the safety and welfare of the public and of those participating in the testing during emission testing.

Summary and Rationale for Section 7(c)(2)(H)

This section clarifies that a manufacturer may propose to conduct PEMS emission testing on a test track rather than an over-the-road test route, and that emission testing conducted on a test track must utilize a speed trace to conform to the chassis dynamometer duty cycles identified in Section 7(d). This is needed to allow another option for conducting PEMS testing that, while potentially more expensive, could provide more repeatable emission test results.

Summary and Rationale for Section 7(c)(3)

This section indicates that, unless otherwise indicated in this section, PEMS equipment specifications, measurement principles, verification requirements, and emissions measurement, calibration, and verification methodologies are provided in 40 Code of Federal Regulations, Part 1065, Subpart J. This is needed to provide clarity to manufacturers regarding requirements for these elements of PEMS testing.

Summary and Rationale for Section 7(c)(3)(A)

This section requires that PEMS emission testing be conducted simultaneously on the hybrid and base vehicle, which is needed to control for environmental factors such as temperature and humidity. This section also indicates that each of the test routes must include at least one cold start, which is needed to evaluate these vehicles' cold start emission profile. Finally, this section recommends at least two days be dedicated to PEMS emission testing. This is needed to help ensure manufacturers are able to complete emission testing pursuant to their proposed Hybrid Technology Emission Test Plan.

Summary and Rationale for Section 7(c)(3)(B)

This section indicates that a charge-depleting hybrid be PEMS tested in charge-sustaining mode. This is needed to ensure a hybrid vehicle utilizes an engine that is at least as clean as its non-hybrid counterpart. This section also indicates that a charge-depleting hybrid that operates over 98 percent of its mileage in charge-sustaining mode be PEMS tested as a charge-sustaining hybrid. This is needed to provide a straightforward way for such a vehicle to be PEMS tested, while ensuring reliable and representative emission results.

Summary and Rationale for Section 7(c)(3)(C)

This section defines additional criteria for conducting cold-start emission tests with a PEMS. This is needed to ensure cold-start emission tests are conducted consistently, and in a way that achieves reliable emission results.

Summary and Rationale for Section 7(c)(3)(D)

This section defines additional criteria for conducting hot-start emission tests with a PEMS. This is needed to ensure hot-start emission tests are conducted consistently, and in a way that achieves reliable emission results.

Summary and Rationale for Section 7(c)(3)(E)

This section incorporates by reference *SAE International J2711: Recommended Practice for Measuring Fuel Economy and Emissions of Hybrid-Electric and Conventional Heavy-Duty Vehicles* for net energy change calculations and variance determinations, and state-of-charge correction procedures. These procedures are needed to adjust emission calculations, if necessary, based upon the amount of hybrid vehicle battery charge at the beginning and end of each emission test, needed to ensure accurate PEMS emission results.

Summary and Rationale for Section 7(c)(3)(F)

This section provides recommended criteria for identifying a valid test run when PEMS testing. This is needed to encourage manufacturers to drive the hybrid and base vehicles as consistently as possible over each test route, as needed to achieve consistent emission results. This section also provides a mechanism for a manufacturer to propose alternate criteria for defining a valid test run as part of its proposed Hybrid Technology Emission Test Plan. This is needed to address situations in which a specific base and/or hybrid vehicle being tested has a challenge meeting the recommended data variance criteria over the on-road test route.

Summary and Rationale for Section 7(c)(3)(G)

This section defines the specific procedures for excluding an emission result if a PEMS test run is determined to be invalid. This is needed to ensure invalid emission results are excluded in a mathematically correct and consistent manner, and to prevent potential gaming by manufacturers. This section also indicates that if a PEMS test run is deemed invalid, that the test run for the hybrid or base vehicle with which it was paired shall also be deemed invalid, and the test run for both vehicles are to be repeated. This is needed to ensure emission data is based upon base and hybrid vehicle pairs driven simultaneously over the given test route and subject to the same environmental conditions, as needed to promote the most reliable emission comparison.

Summary and Rationale for Section 7(c)(3)(H)

This section indicates that a manufacturer may propose, as part of its Hybrid Technology Emission Test Plan, a statistical method for identifying and excluding measured emission data outliers. This is needed to identify and exclude potential outlier emission data that may not be reflective of a vehicle's typical in-use operation.

Summary and Rationale for Section 7(c)(3)(I)

This section requires that all PEMS emission data (including data from test runs deemed invalid) that is collected on days identified in the manufacturer's Hybrid Technology Emission Test Plan as an official emission test day, including contingency test dates, be provided to ARB, including invalid test results; and prohibits the use of invalid tests when calculating emissions under these procedures. This is needed for ARB to ensure that only valid emission data is used in a manufacturer's emission compliance demonstration, but that ARB also has all the pertinent information.

Summary and Rationale for Section 7(c)(4)

This section defines the type of engine parameter, emissions and other data that must be collected and how it must be collected during PEMS testing. This is needed to ensure that emission testing requirements are clear and precise, and adhere to established principles of science and engineering.

Summary and Rationale for Section 7(c)(4)(A)

This section specifies the data that must be provided by the engine control module during PEMS testing. This is needed to ensure that engine data needed to validate how

the vehicle is being operated and ensure the accuracy of resulting emissions is captured in an accurate and systematic way.

Summary and Rationale for Section 7(c)(4)(B)

This section specifies the data that must be provided by a global positioning system during PEMS testing. This is needed to ensure that vehicle location data needed to validate how the vehicle is being operated and ensure the accuracy of resulting emissions is captured in an accurate and systematic way.

Summary and Rationale for Section 7(c)(4)(C)

This section specifies additional data required to be collected during a PEMS test and the mechanism(s) by which it must be captured. This is needed to ensure that all remaining data regarding engine operation and ambient conditions needed to validate how the vehicle is being operated and ensure the accuracy of resulting emissions is captured in an accurate and systematic way.

Summary and Rationale for Section 7(c)(4)(D)

This section identifies the data and information that the manufacturer is to calculate and report to ARB. This is needed to validate that vehicle PEMS test runs and emission data meet the requirements of the ITR's emission test procedures.

Summary and Rationale for Section 7(c)(4)(E)

This section identifies the pollutants to be measured by the PEMS unit, and the protocol for measuring vehicle fuel consumption. This is needed to ensure that emission testing requirements are clear and precise, and adhere to established principles of science and engineering.

Summary and Rationale for Section 7(c)(4)(F)

This section requires a manufacturer to provide emission test data to ARB for all PEMS test runs conducted during the days of emission testing identified in the Executive Officer-approved Hybrid Technology Emission Test Plan, including test runs that are not included in emissions calculations, and incomplete or partial test runs, and the reason(s) for their exclusion. This is needed to ensure that a manufacturer does not selectively choose emission data for the purpose of demonstrating emission compliance.

Summary and Rationale for Section 7(c)(5)

This section defines the method of calculating and weighting a hybrid and base vehicle's emissions that are captured during a PEMS test, as needed to determine their anticipated emissions during typical in-use operation. This is needed to ensure emissions are calculated accurately and consistent with established principles of science and engineering.

Summary and Rationale for Section 7(c)(6)

This section defines the protocol for determining whether or not criteria pollutant emissions measured by the PEMS from the hybrid vehicle exceed those from the base

vehicle. This is needed to determine whether a hybrid engine or vehicle meets the ITR's emission requirements for criteria pollutants.

Summary and Rationale for Section 7(c)(7)

This section defines the protocol for determining whether or not the hybrid vehicle achieves at least a ten percent CO₂ reduction, as measured by the PEMS, relative to its non-hybrid counterpart. This is needed to determine whether a hybrid vehicle meets the ITR's emission requirement for CO₂.

Summary and Rationale for Section 7(d)

This section indicates that vehicles tested over the chassis dynamometer must meet the requirements of Section 7(d). This is needed to provide clarity to manufacturers regarding the ITR's required chassis dynamometer emission test procedures.

Summary and Rationale for Section 7(d)(1)

This section identifies, for conversion of light- and medium-duty vehicles that were originally certified on a chassis dynamometer, criteria for testing the hybridized vehicle on a chassis dynamometer to determine if it meets the ITR's emission criteria. This section also identifies the criteria for evaluating whether emissions from the converted vehicle as measured on a chassis-dynamometer pass or fail the ITR NO_x, CO, HC, PM, and CO₂ emission requirements. This is needed to define how a conversion system for a chassis-certified light- or medium-duty vehicle is to be evaluated on a chassis dynamometer to determine if it meets the ITR emission criteria.

Summary and Rationale for Section 7(d)(2)

This section identifies, for conversion of medium-duty engines that were originally certified on an engine dynamometer, criteria for testing the base engine and vehicle in which it is installed and the hybridized engine and vehicle in which it is installed on a chassis dynamometer to determine if the conversion system meets the ITR's emission criteria. This section also identifies the criteria for evaluating whether a conversion system for such an engine passes or fails the ITR NO_x, CO, HC, PM, and CO₂ emission requirements. This is needed to define how a conversion system for a medium-duty engine that is originally certified on an engine dynamometer is to be evaluated to determine if it meets the ITR emission criteria.

Summary and Rationale for Section 7(d)(3)

This section identifies, for conversion of heavy-duty engines that were originally certified on an engine dynamometer, criteria for testing the base engine and vehicle in which it is installed and the hybridized engine and vehicle in which it is installed on a chassis dynamometer to determine if the conversion system meets the ITR's emission criteria. This section also identifies the criteria for evaluating whether a conversion system for such an engine passes or fails the ITR NO_x, CO, HC, PM, and CO₂ emission requirements. This is needed to define how a conversion system for a heavy-duty engine is to be evaluated to determine if it meets the ITR emission criteria.

Summary and Rationale for Section 7(d)(4)

This section allows a manufacturer to propose an alternate duty cycle for use in chassis dynamometer emission testing as part of its Hybrid Technology Emission Test Plan. This is needed because, while the ITR duty-cycles reflect the average anticipated in-use activity for light-, medium- and heavy-duty vehicles, the diversity of potential commercial truck and bus vocations could have different in-use activity profiles. Allowing use of an alternate duty cycle based upon a specific proposed vehicle type and vocation enables emission testing and collection of emission data that may be more reflective of the actual in-use impact of the hybrid conversion system.

Summary and Rationale for Section 7(d)(5)

This section requires that a charge-depleting hybrid be emission tested in charge-sustaining mode. This is needed to ensure a hybrid vehicle utilizes an engine that is at least as clean as its non-hybrid counterpart. This section also indicates that a charge-depleting hybrid that operates over 98 percent of its mileage in charge-sustaining mode must be tested as a charge-sustaining hybrid. This is needed to provide a straightforward way for such a vehicle to be emission tested, while ensuring reliable and representative emission results.

Summary and Rationale for Section 7(d)(6)

This section provides that a vehicle with AER can utilize a utility factor to adjust its CO₂ emissions for the purposes of emission calculations. This is needed to reflect, in the CO₂ emission calculations, the potential CO₂ emission reductions achieved by a vehicle's zero-emission operation.

Summary and Rationale for Section 7(e)

This section defines how a hybrid vehicle's AER, if any, is to be measured pursuant to this regulation. This is needed to provide a simple and accurate mechanism for determining a vehicle's AER under typical driving conditions.

Summary and Rationale for Section 7(f)

This section provides additional emission test criteria and requirements applicable to new heavy-duty hybrid engines that opt to participate in the proposed ITR. This is needed because new hybrid engines are certified differently than hybrid conversion systems, and additional criteria are needed to identify an appropriate base vehicle for the purposes of emission testing.

Summary and Rationale for Section 7(f)(1)

This section specifies how a base engine and vehicle that is to be paired with its hybrid counterpart for the purposes of emission testing is to be selected. This is needed to ensure that the base and hybrid vehicle are equivalent, with the exception of the hybrid system, such that emission differences between the two vehicles can be attributed to the hybrid system.

Summary and Rationale for Section 7(f)(2)

This section indicates what type of fuel must be used by the base and hybrid vehicle for the purposes of emission testing a new hybrid engine and its non-hybrid counterpart. This is needed to ensure that emission differences between the base and hybrid vehicle are based upon hybridization of the typical base vehicle, rather than a difference in the fuel type.

Summary and Rationale for Section 7(f)(3)

This section indicates that a hybrid engine certifying to meet “Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Vehicles – Phase 1” that concurrently measures NO_x, CO, and HC emissions as part of that certification process may use the post-transmission powertrain vehicle simulation and NO_x, CO, and HC emissions data derived pursuant to said certification testing to demonstrate compliance with the ITR’s emissions criteria. It also provides the method for calculating percent CO₂ reduction under those circumstances. This is needed to provide manufacturers with a more economical mechanism to demonstrate compliance with the ITR’s emissions criteria.

Summary and Rationale for Section 8(a)

This section identifies the process for an applicant to submit an application to the Executive Officer for each discrete conversion system the applicant wishes to have certified by ARB as Tier 1-, Tier 2-, or Tier 3-compliant. This section also explains how the Executive Officer will determine what actions will be taken, and that those actions will be based on the information provided through the application process. This is needed to ensure applicants understand that an application is necessary for certification approval, and to explain why the Executive Officer requires this information from each applicant.

Summary and Rationale for Section 8(b)

This section identifies the information an applicant must provide to the Executive Officer when submitting an application for hybrid conversion system certification. This includes the contact information for the applicant and the authorized installer; technical details regarding the hybrid conversion system; description of the energy storage system and how the conversion system interacts with and is integrated with the base vehicle and the OBD system; an engineering evaluation of the negative emission impacts of the conversion system; the proposed emission test plan; the conversion system owner’s manual and warranty statements; and several other key pieces of information necessary to an understanding of the applicant’s hybrid conversion system. This is needed to provide the Executive Officer with all relevant data necessary for his or her review of the applicant’s hybrid conversion system, to support the certification decision making process, and to ensure durability and performance of the system, once certified.

Summary and Rationale for Section 8(c)

This section indicates that the Executive Officer may require a manufacturer to provide a market-ready hybrid conversion system or converted hybrid vehicle for inspection

and/or testing as part of the application for ARB certification. This is needed to provide the Executive Officer with the ability to perform his or her own inspection and/or testing, to fully understand the conversion system componentry, engineering, or other elements needed to evaluate such system.

Summary and Rationale for Section 9(a)

This section indicates that if the Executive Officer determines that the hybrid conversion system meets the requirements of the ITR, then he or she will issue an Executive Order certifying the hybrid conversion system for sale and installation. This is needed to inform applicants how an Executive Order is issued, what an Executive Order means, and what occurs after the Executive Officer has approved an application.

Summary and Rationale for Section 9(a)(1) and 9(a)(1)(A)

This section identifies that if a manufacturer of a Tier 2 or Tier 3 hybrid conversion system has demonstrated a 20 percent CO₂ emission reduction and has been demonstrated to comply with all other applicable requirements, then the conversion system will receive an Executive Order identifying it as providing said CO₂ benefit. This is needed to enable a manufacturer to market a conversion system as achieving a 20 percent potential CO₂ benefit, if so demonstrated by these certification procedures. This is also needed because conversion system certification does not amend, alter, or update the CO₂ emission standard achieved by the original engine or vehicle, nor does it convey achievement of a specific CO₂ emission standard for the converted engine or vehicle.

Summary and Rationale for Section 9(a)(2)

This section identifies that a manufacturer who has received an Executive Order for the demonstrated 20 percent CO₂ emission reduction for a hybrid conversion system cannot use this Executive Order to demonstrate compliance with any rule, regulation, or any other air quality mandate, or to obtain credit as part of any emission averaging, banking, or trading program. This is needed because conversion system certification does not amend, alter, or update the CO₂ emission standard achieved by the original engine or vehicle, nor does it convey achievement of a specific CO₂ emission standard for the converted engine or vehicle.

Summary and Rationale for Section 9(b)(1)

This section provides the opportunity for emissions test data from one engine or vehicle to be deemed representative of emission test data from a similar or identical engine (i.e., carryover or carry-across data) if such data adequately represents the emission and OBD monitor performance of the hybrid conversion system to be certified. This is needed to streamline certification for different potential base engine or vehicle and hybrid conversion system combinations with minor differences that are unlikely to impact emissions.

Summary and Rationale for Section 9(b)(2)

This section requires that requests for use of carryover and carry-across data be accompanied by an engineering analysis demonstrating that such data adequately

represent the emission and OBD monitor performance of the hybrid conversion system to be certified. This is needed to ensure that the Executive Officer has enough information to determine if emission performance on a conversion system using such data is adequately represented by that of the similar or identical engine or vehicle from which the data derives.

Summary and Rationale for Section 9(b)(3)

This section indicates that changes made to the design or operating conditions of a hybrid conversion system must be described in writing and submitted for Executive Officer approval, and that any changes to the design or operating conditions of the hybrid conversion system not approved in advance and in writing by the Executive Officer may invalidate the hybrid conversion system certification. This is needed to apprise ARB of potential changes to the conversion system that could impact emissions or eligibility for certification, to encourage manufacturers to provide such information to ARB in advance of implementing such changes, and to enable ARB to invalidate certification system certification if needed.

Summary and Rationale for Section 10(a)(1)

This section indicates that the hybrid conversion system manufacturer must warrant that the conversion system will not cause damage to any part on the converted vehicle or engine and is free from defects that can cause the system to fail to conform to the applicable requirements of the ITR, and identifies minimum hybrid conversion system warranty periods. This warranty must cover customer service and the full repair or replacement costs. This is needed to protect the purchaser of a hybrid conversion system from potential financial losses due to a malfunction or defect that causes the converted vehicle or engine to perform worse than demonstrated in the application for certification. This also helps encourage the manufacture of robust, high-quality hybrid conversion systems.

Summary and Rationale for Section 10(a)(2)

This section indicates that the repair or replacement of any part otherwise eligible for warranty coverage may be excluded from said warranty if the vehicle or engine has been abused, neglected, or improperly maintained and this abuse was the direct cause of the need for the repair. This is needed to protect the manufacturer in case there is a failure to the hybrid conversion system but the fault does not lie with the manufacturer and is instead due to abuse or improper maintenance.

Summary and Rationale for Section 10(b)

This section indicates that each authorized installer of a hybrid conversion system must warrant to the purchaser of a vehicle or engine converted that the hybrid conversion system will not fail to conform to the requirements of the ITR due to incorrect installation, and that no part will be damaged due to improper installation. This section also indicates that an installer must indemnify the possessor of a converted vehicle or engine, and each subsequent purchaser, for any fines imposed as a result of improper installation of the system. These warranties and indemnification must be effective for 3 years or 50,000 miles, whichever comes first, and must cover the full repair or

replacement costs. This is needed to protect consumers from financial loss due to an improperly installed hybrid conversion system, and to encourage proper installation of hybrid conversion systems.

Summary and Rationale for Section 10(c)

This section indicates that a manufacturer must include the specified product warranty statement in the owner's manual, which must be provided to each owner upon delivery of the hybrid conversion system. This is needed to protect consumers, by ensuring that purchasers of hybrid conversion systems understand their warranty rights and obligations.

Summary and Rationale for Section 10(d)

This section indicates that the manufacturer of a hybrid conversion system must notify the purchaser or lessee in writing prior to purchase or lease that installation of the hybrid conversion system may affect the base vehicle or engine manufacturer's warranty. This is needed to protect consumers, by ensuring that hybrid conversion system purchasers understand, prior to purchase, that the base vehicle or engine's warranty may change due to installation of the system.

Summary and Rationale for Section 10(e)

This section indicates that any authorized installer must provide the owner with a copy of the specified installation warranty statement. This is needed to protect consumers, by ensuring that every purchaser of a hybrid conversion system is notified of his or her installation warranty rights and obligations.

Summary and Rationale for Section 10(f)

This section defines when and how a manufacturer must notify ARB of a defective or malfunctioning part or component of its hybrid conversion system. This is needed to enable ARB to be apprised of malfunctioning hybrid conversion system parts or components, as needed to protect consumers.

Summary and Rationale for Section 11

This section indicates that if the Executive Officer determines that a hybrid conversion system has the potential to experience catastrophic or other safety-related failure due to the same part or component, then the Executive Officer may require the manufacturer to submit a recall plan and conduct a recall. It also outlines the time frame and actions to be taken when a recall provision is enacted, and what procedures apply to recalls. This is needed to ensure that if there is a major failure with a manufacturer's hybrid conversion system, the Executive Officer can require a recall, in order to protect the purchasers of these systems from the consequences of this failure. This also ensures that manufacturers will attempt to create robust, high-quality parts, in order to prevent a potential recall from becoming necessary. Finally, it also helps provide manufacturers with an understanding of how the proposed ITR would work together with ARB's existing regulations.