

**Draft Heavy-Duty Vehicle Inspection and Maintenance (HD I/M)
Regulatory Concepts – December 2020**

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I. Purpose

The purpose of this regulation, as described in the 2016 Mobile Source Strategy and the 2016 State Strategy for the State Implementation Plan and Senate Bill 210, is to ensure vehicles' emissions control systems remain well-maintained, and to identify vehicles with emission control component malfunctions and require timely repairs, thereby reducing in-use NOx and PM emissions from non-gasoline heavy-duty vehicles greater than 14,000 pounds gross vehicle weight rating (GVWR) that operate in California, including out-of-state vehicles.

II. Definitions

(a) For the purposes of this article, the following definitions shall apply:

- (1) "Aftermarket Parts Label" means a label that is affixed or stamped on or near the approved part for any non-California Air Resources Board (ARB) approved emission related aftermarket parts in accordance with California Vehicle Code (VC) section 27156.
- (2) "Agricultural vehicle" means a vehicle, or truck-tractor and trailer combination, owned by a farming business and used exclusively in one or more of the following ways:
 - (A) In agricultural operations;
 - (B) To transport harvested farm products to the first point of processing; and
 - (C) to directly support farming or forestry operations, which may include supply trucks, cattle trucks, trucks owned by bee keeping businesses and used exclusively to transport their own bees or honey to the first point of processing, and other vehicles but does not include vehicles that do not directly support farming operations such as personal use vehicles, vehicles rented or leased to others for non-agricultural uses that do not qualify, or vehicles used in a transportation business other than to transport harvested farm products to the first point of processing.
- (3) "Alternative fuel" means natural gas, propane, ethanol, methanol, or other technologies that do not rely on diesel fuel with the exception of hydrogen, electricity, or fuel cells. "Alternative fuel" also means any of these fuels used in combination with each other or in combination with other non-diesel fuels.
- (4) "Alternative fuel retrofit system" or "retrofit system" is a package of fuel storage and delivery, ignition, emission control, on board diagnostic (OBD), and engine components that are modified, removed, or added during the process of modifying a motor vehicle or engine to operate on an alternative fuel.

- (5) “Applicant” means the entity that has applied for device certification or has been granted an Executive Order.
- (6) “Automatic License Plate Recognition (ALPR)” means a device that consist of cameras that identify vehicles on California roadways by capturing license plate information.”
- (7) “Authorized dealer” means a group of independent service and repair facilities that are recognized by the motor vehicle or engine manufacturer as being capable of performing repairs to factory specifications; including warranty repair work.
- (8) “Authorized emergency vehicle” means vehicles meeting one of the following requirements:
 - (A) Authorized emergency vehicles as specified in Section 165 of the Vehicle Code.
 - (B) A publicly owned authorized emergency vehicle used by an emergency medical technician-paramedic, as defined in Section 1797.84 of the Health and Safety Code, only as necessary to ensure the ability to respond to emergencies.
- (9) “Authorized representative” means a person who takes responsibility for all the information submitted for OBD test device certification and who signs the device certification application.
- (10) “Calendar year” means January 1 to December 31 for a given year.
- (11) “CARB” means the California Air Resources Board.
- (12) “CARB post-repair inspection” means a repeat emission control system inspection, conducted by the California Air Resources Board inspector or referee.
- (13) “Certified continuously connected remote OBD (CC-ROBD) tool” means a certified OBD data collection and submission tool or device certified to meet the standards in section VIII installed exclusively on one vehicle that is connected to the vehicle at all times.
- (14) “Certified non-continuously connected OBD device (NCC-ROBD) tool” means a certified OBD data collection and submission tool or device certified to meet the standards in section VIII and designed for use on multiple vehicles.
- (15) “Certification” means relating to the process of obtaining an Executive Order with respect to an OBD test device, complying with the device certification requirements specified in title 13, California Code of Regulations (CCR), section IX of this chapter.
- (16) “Citation” means a legal notice issued by the California Air Resources Board to the owner of a heavy-duty vehicle requiring the owner to repair the vehicle, to submit a demonstration of correction, and to pay a civil penalty.

(17) “Compliance certificate” means a certificate, obtained after demonstrating compliance with this chapter, issued by the Executive Officer confirming the vehicle can legally operate in the state.

(18) “Compliance year” refers to the annual period of a vehicle’s periodic testing schedule.

For vehicles that register with DMV on an annual basis, the compliance year is defined as the full year that a vehicle’s DMV registration is valid as specified on a vehicle’s annual DMV registration card. For vehicles registered outside of California, the compliance year is based on the jurisdiction where the vehicle is registered.

For vehicles that register with DMV on a non-annual basis, the beginning of a compliance year is defined as starting on the day and month that a vehicle was initially registered with DMV for a given year and ending on the previous day and month the following year. For example, if a vehicle was initially registered with DMV on February 22 of a given year, the vehicle’s compliance year for the purposes of this chapter would follow the pattern of 02/22/2025 through 02/21/2026 for each given year.

Vehicles exempt from DMV registration shall be subject to a compliance year beginning on July 1st and ending on June 30th of the following year.

(19) “Consumable fuel” means any solid, liquid, or gaseous matter that releases energy when consumed by an auxiliary power unit.

(20) “Data Link Connector” is a multi-pin diagnostic connection port for vehicles, used to interface a scan tool with the control modules of a given vehicle and access on-board diagnostics and live data streams.

(21) “Day” means calendar day.

(22) “Declared DMV operation months” means a vehicle’s specific months of operation as specified to DMV during the registration process.

(23) “Defective” means a condition in which an emission control system or an emission control system component is malfunctioning due to age, wear, malmaintenance, improper installation, or design defects.

(24) “Demonstration of correction” means the documents identified in section (X)(c).

(25) “Designee” means a person authorized by a vehicle or fleet owner to electronically register for an account within an electronic reporting system approved by the Executive Officer and to update and maintain the account information as necessary.

(26) “Driver” has the same meaning as defined in California Vehicle Code Section 305.

(27) “Emission control label (ECL)” means the label required by the “California Motor Vehicle Emission Control Label Specifications”,

incorporated by reference in title 13, CCR, section 1965, or Title 40, Code of Federal Regulations (CFR), Part 86, Subpart A. 13 CCR 2180.1.

- (28) “Emission control system” means the pollution control components on an engine at the time its engine family is certified, including, but not limited to, the emission control label.
- (29) “Engine change” means the installation of an engine in a vehicle that is different from the vehicle manufacturer original configuration as certified by the United States Environmental Protection Agency or California Air Resources Board.
- (30) “Engine start” is defined as the point when the engine reaches a speed 150 rpm below the normal, warmed-up idle speed (as determined in the drive position for vehicles equipped with an automatic transmission). For hybrid vehicles or for engines employing alternate engine start hardware or strategies (e.g., integrated starter and generators), the manufacturer may request Executive Officer approval to use an alternate definition for engine start (e.g., ignition key “on”). Executive Officer approval of the alternate definition shall be based on equivalence to an engine start for a conventional vehicle.
- (31) “Executive Officer” means the Executive Officer of the California Air Resources Board or his or her designee.
- (32) “Executive Order (EO)” means an order issued by the Executive Officer certifying devices for sale in California and for use in the Heavy-duty Inspection and Maintenance Program.
- (33) “Executive Order (EO) holder” refers to any person or persons who obtain(s) an Executive Order for device certification
- (34) “Fraudulent” means any knowingly false statement or representation in any application, report, statement, or other document filed, maintained, or used for the purposes of compliance with this regulation.
- (35) “Federal emission standards” means the emission standards adopted by the U.S. Environmental Protection Agency, pursuant to Title 42 United States Code, section 7521(a), that are required to be met for the certification of heavy-duty vehicles or engines.
- (36) “Fleet” means one (1) or more heavy-duty vehicles owned by the same person or company.
- (37) “Fleet Facility” means an area where a vehicle primarily performs shipping and/or receiving operations, vehicle troubleshooting, repair, testing, and/or vehicle storage.
- (38) “Freight Contractor” means any Person involved in a transaction that requires the operation of a Heavy Duty vehicle in the State of

California. This includes but is not limited to a shipper, receiver, carrier, broker, facility, or any other intermediary party.

- (39) “Gross vehicle weight rating (GVWR)” is as defined in Vehicle Code Section 350.
- (40) “HD I/M approved tester” means a person trained in accordance with the requirements of section V to conduct OBD inspections and/or smoke opacity inspections required by this chapter.
- (41) “Heavy-duty vehicle” means any motor vehicle having a manufacturer's gross vehicle weight rating (GVWR) greater than 14,000 pounds.
- (42) “High Emitter” means any vehicle that exceeds the minimum emissions thresholds defined in section (III)(g).
- (43) “Hybrid vehicle” refers to a vehicle (including a plug-in hybrid electric vehicle) that can draw propulsion energy from either or both of the following on-vehicle sources of stored energy: 1) a consumable fuel; and 2) an energy storage device such as a battery, capacitor, or flywheel.
- (44) “Hypertext Transfer Protocol Secure (HTTPS)” is the protocol where encrypted HTTP data is transferred over a secure connection.
- (45) “Inadequately Maintained” means in a state that does not adhere to the certified manufacturers configuration or that causes emissions to be in excess of the allowable thresholds, resulting from the failure to perform necessary routine maintenance and repair.
- (46) “Inspection site” means an area including a random roadside location, a weigh station, or a fleet facility used for conducting the heavy-duty vehicle test procedure, emission control system inspection, or both.
- (47) “Inspector” means a California Air Resources Board employee with the duty of enforcing Health and Safety Code Section 44152.
- (48) “In-Person Field Inspection” means any inspection conducted by a CARB inspector/CARB staff and/or a peace officer at an inspection site.
- (49) “Issuance” means the act of mailing, providing digitally, or personally delivering a Compliance Certificate, Citation or Notice to Correct to the owner.
- (50) “In-use device or tool” means a device or tool currently in the field that is already installed in a vehicle or used by a fleet owner.
- (51) “Low-use vehicle” means a vehicle is registered as a low-use vehicle with the Truck and Bus regulation, section 2025, title 3, CCR. Such vehicles will be operated fewer than 1,000 miles in California in any compliance year. If that vehicle has an engine that powers other equipment that can only be used while stationary, the engine or power take off (PTO) must also operate less than 100 hours in any calendar year. The hour limitation does not apply for vehicles where the engine is

used to power an auxiliary mechanism that strictly loads and unloads cargo from the vehicle (examples include, but are not limited to, dump trucks, cement powder trucks, or trucks with attached lift devices).

- (52) “Malfunction” means any deterioration or failure of a component or system that causes the performance to be outside of the applicable limits.
- (53) “Malfunction indicator light” (MIL) means the light displaying the International Standards Organization (ISO) 2575 engine symbol F01, consistent with subdivision (d) of section 1971.1, title 13, CCR. There shall be only one MIL used to indicate all faults detected by the OBD system on a single vehicle.
- (54) “Manufacturer” means any person who manufactures and sells a device or tool. It also means the person who is granted certification for a certified device or tool.
- (55) “Manufacturer Configuration” means an engine configuration in which all parts and components are properly installed and in place, in accordance with the requirements outlined in the certification application and the applicable engine family Executive Order.
- (56) “Motor Home” means a single vehicular unit designed for human habitation for recreational or emergency occupancy and built on, or permanently attached to, a self-propelled motor vehicle chassis, chassis cab, or van, which becomes an integral part of the completed vehicle or a vehicle that exclusively tows a trailer that was originally designed for human habitation for recreational or emergency occupancy.
- (57) “New vehicle with a heavy-duty engine certified to meet the most stringent optional reduced NOx standard” means a new heavy-duty vehicle equipped with an engine certified to the most stringent optional low NOx standard as defined in title 13, CCR, section 1956.8, for the specified model years.
- (58) “Non-volatile random access memory (NVRAM),” for the purposes of this regulation, is defined as a type of memory that retains its contents even when power to the on-board control unit is interrupted (e.g., vehicle battery disconnected, fuse to control unit removed). NVRAM is typically made non-volatile either by use of a back-up battery within the control unit or through the use of an electrically erasable and programmable read-only memory (EEPROM) chip.
- (59) “Notice to Correct (NTC)” means a legal notice issued to the owner of a heavy-duty vehicle, requiring the owner to repair the vehicle and/or submit a demonstration of correction.
- (60) “On Board Diagnostics (OBD)” means any system certified to meet the requirements of title 13, CCR, sections 1968.1, 1968.2, 1971.1, or future OBD requirements adopted by the California Air Resources Board.

- (61) “OBD data test vehicle” means a vehicle that is used for purposes of testing a potential OBD test device during the certification process.
- (62) “OBD-equipped vehicle” means a vehicle equipped with a certified heavy-duty engine that meets the requirements of title 13, CCR, section 1971.1 for the following model years and fuel types:
 - (A) Model year 2013 and newer diesel engines;
 - (B) Model year 2013 and newer diesel hybrid engines;
 - (C) Model year 2018 and newer alternative fuel engines; and
 - (D) Model year 2018 and newer alternative fuel hybrid engines.
- (63) “OBD key event” means a specific event that identifies a potential change in a vehicle’s emissions systems monitoring characteristics that may impact the operating condition of emission related components on the vehicle.
- (64) “OBD protocol group” means the vehicle’s OBD communication protocol such as SAE J1939, SAE J1979, and/or SAE J1979-2.
- (65) “Officer” means a uniformed member of the Department of the California Highway Patrol.
- (66) “Opacity” means the percentage of light obstructed from passage through an exhaust smoke plume.
- (67) “Owner” of a vehicle means the person or persons registered as the owner of a vehicle by the California Department of Motor Vehicles (DMV), or its equivalent in another state, province, or country (presumed at the time of any citation to be the person or persons identified as the owner on the registration document or title carried on the vehicle), except the following circumstances for vehicles that are rented:
 - (A) If the rental agreement is for a period of less than one year, the owner of the vehicle shall be responsible for compliance.
 - (B) If the rental agreement is for a period of one year or longer, responsibility for compliance may be transferred to the renter of the vehicle, only if there is a written notice signed by both owner of the rented vehicle and renter. The written notice shall be included in the existing rental agreement or provided in a separate document with the following statement: “The renter of this vehicle understands that when operating this vehicle in California, the vehicle must be compliant with sections TBD, title 13, CCR, and that it is the responsibility of the renter to ensure this vehicle is compliant.” This written notice shall be electronically submitted to CARB by the owner of the rented vehicle following a method approved by the Executive Officer.
 - (C) For purposes of enforcement, if the rented vehicle is cited for noncompliance, the owner of the vehicle shall be considered the

responsible entity unless CARB has a written notice meeting the requirements of section (B) on file that specifies otherwise.

- (D) “For purposes of this subsection, the terms “rental company,” “rental agreement,” “rented,” “owner of the rented vehicle,” and “renter,” mean the same as “leasing company,” “lease agreement,” “leased,” “lessor,” and “lessee” respectively.
- (68) “Owner’s manual” means a document or collection of documents prepared by the manufacturer of a product for the owners or operators to describe appropriate maintenance, applicable warranties, and any other information related to operating or keeping the product. The owner’s manual is typically provided to the ultimate purchaser at the time of sale. The owner’s manual may be in paper or electronic format.
- (69) “Partial year registration” means a DMV vehicle registration for eligible vehicles that are not operated throughout a calendar year. This registration can be valid for any amount of time between 1-12 months.
- (70) “Payment” means a financial transaction intended as a recompense or restitution by bank check, money order, electronic bank transfer or credit card.
- (71) “POST method” is a HTTPS method that is designed to send loads of data to a server from a specified resource.
- (72) “Referee (contractor)” means a facility under contract with CARB to provide independent evaluations of vehicles and services to accommodate vehicles with unusual inspection circumstances.
- (73) “Removal from service” means the towing and storage of a vehicle under California Vehicle Code section 27159 and under the auspices of the California Highway Patrol.
- (74) “Rental or leasing company” means a business that rents or leases registered vehicles.
- (75) “Renter” means a person who rents and or operates registered engines or equipment units not owned by that person.
- (76) “Repair facility” means any place where heavy-duty vehicles are repaired, rebuilt, reconditioned, or in any way maintained for the public at a fee, and fleet maintenance facilities.
- (77) “SAE J1667” means Society of Automotive Engineers (SAE) Recommended Practice SAE J1667 “Snap-Acceleration Smoke Test Procedure for Heavy-Duty Diesel Powered Vehicles,” as issued February 1996 (“1996-02”), which is incorporated herein by reference.
- (78) “Smoke meter” means a detection device used to measure the opacity of smoke in percent opacity.

- (79) “Smoke test” or “smoke opacity test” means a test of a vehicle's emissions for smoke opacity level conducted using the procedures described in section (III)(2)(D).
- (80) “Tactical military vehicle” means a motor vehicle as defined in section 1905, title 13, CCR.
- (81) “Tampered” means missing, modified, or disconnected, or, as it applies to emission control labels, permanently obscured.
- (82) “Temporary Operating Permit” means a permit issued by the DMV, which allows a motorist to operate a vehicle for a limited time when all registration fees have been paid, but license plates and/or registration stickers have not been issued.
- (83) “Test procedures,” are any test methods specified by this regulation, conducted in the implementation of the HD I/M Regulation.
- (84) “Three-day pass” means a once-a-year temporary permit, obtained online from the Executive Officer, to operate a vehicle in California for three consecutive days without meeting the requirements of section III(d).
- (85) “Ultimate purchaser” means the first person who purchases a new OBD test device.
- (86) “Unresolved Citation” means a Citation for which demonstration of correction and, if required, payment of any civil penalty has not been paid.
- (87) “Vehicle identification number (VIN)” means an alpha numeric code which has been permanently assigned by the manufacturer to a vehicle. The VIN is unique to each vehicle and may contain information deemed necessary by governing agencies. If a manufacturer cannot obtain a federal VIN from the National Highway Traffic Safety Administration for their vehicles, an alternative VIN approved by the Executive Officer of the California Air Resources Board may be used. Unless otherwise noted, the VIN and alternate VIN will follow formats specified in the Code of Federal Regulations 49, Chapter V, Parts 565, 566, and 571, which are incorporated herein by reference.
- (88) “Vendor” means any person who manufactures or sells a device or tool. It also means the person who is granted certification for a certified device or tool.
- (89) “Verified diesel emissions control strategy (VDECS)” means a diesel emission control strategy or system that has received approval (i.e., verified) from the Executive Officer according to the “Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines” in title 13, CCR, commencing with section 2700. Level 2 VDECS means the strategy reduces engine diesel particulate matter emissions by between 50 and 84 percent. Level 3 VDECS means the

strategy reduces engine particulate matter emissions by 85 percent or greater, or reduces engine emissions to less than or equal to 0.01 grams diesel particulate matter per brake horsepower-hour.

- (90) “Zero-emission heavy-duty vehicle” means a vehicle with a manufacturer’s GVWR greater than 14,000 lbs. with a drivetrain that produces zero exhaust emissions of any criteria pollutant (or precursor pollutant) or greenhouse gas under any possible operational modes or conditions.

III. Requirements on Owners of Vehicles

(a) Applicability

- (1) This chapter applies to all non-gasoline on-road heavy-duty vehicles operating in California, including those registered for use in other states and countries, and the owners and operators of such vehicles.
- (2) Exemptions – this regulation does not apply to:
 - (A) A zero-emission heavy-duty vehicle;
 - (B) Authorized emergency vehicles;
 - (C) A tactical vehicle operated by the military;
 - (D) For four (4) years from the time periodic inspections begin under this chapter, when a new vehicle with a heavy-duty engine has been certified to meet the most stringent optional reduced NOx standard as defined in title 13, CCR, section 1956.8, for the specified model years.

(b) Owner and Vehicle Registration

(3) Owner Registration

- (A) The owner or designee shall electronically register for an account within a reporting system approved by the Executive Officer.
- (B) The owner or designee shall electronically report the following information to the reporting system approved by the Executive Officer and shall be responsible for ensuring any entered information remains current and accurate:
 1. Registered Owner Name
 2. Company Name
 3. Fleet/Secondary Name (if applicable)
 4. Designee (if applicable)
 5. Title of Designee (if applicable)
 6. Contact Email Address
 7. Contact Mailing Address
 8. Contact Phone Number
 9. Company Physical Address
 10. United States Department of Transportation (US DOT) number (if applicable)

11. CA Motor Carriers Permit (MCP) ID (if applicable)
 12. Public Utilities Commission (PUC) ID (if applicable)
- (4) Vehicle Registration
- (A) For vehicles subject to the requirements of this chapter, the owner or designee shall be required to electronically report the following vehicle information to the reporting system approved by the Executive Officer and shall be responsible for ensuring any entered information remains current and accurate.
 1. VIN
 2. License plate number
 3. Registration state
 4. Vehicle make
 5. Vehicle model
 6. Vehicle model year
 7. Engine make
 8. Engine model
 9. Engine model year
 10. Engine family
 11. Engine fuel type
 12. GVWR
 13. Registered Owner name
 14. Registered Owner mailing address
 15. Physical address where vehicle is domiciled
 - (5) The owner or designee shall use the electronic reporting system approved by the Executive Officer to complete the following tasks:
 - (A) Access vehicle compliance status information
 - (B) Pay compliance fees.
 - (C) Submit any required supporting vehicle compliance documentation.
- (c) HD I/M Inspection Methods and Periodic Data Submission Frequencies
- (1) OBD-Equipped Vehicles. If a vehicle is equipped with OBD, the following submission and inspection requirements apply:
 - (A) Vehicles shall demonstrate compliance by submitting OBD data to CARB.
 - (B) OBD data shall be submitted using one of the remote OBD data collection and submission methods identified below:
 1. For a certified continuously connected remote OBD (CC-ROBD) tool that meets the requirements of section VIII and is exclusively registered to a unique VIN, either of the following tools may be used to submit periodic inspection data:
 - a. A certified CC-ROBD tool that includes the basic key events monitoring functionalities as specified in the device requirements section (VIII)(c)(4)(D).
 - b. A certified CC-ROBD tool that includes the full key events monitoring functionalities as specified in the

- device requirements section (VIII)(c)(4)(A) through (C).
2. A certified non-continuously connected remote OBD (NCC-ROBD) tool that is registered and operated by a HD I/M approved tester.
 3. A certified NCC-ROBD tool assigned by the Executive Officer or a designee for operation at designated locations in California.
- (C) An OBD-equipped vehicle shall fail the OBD inspection if one or more of the following conditions occur:
1. The vehicle's OBD system reports the malfunction indicator light (MIL) as commanded on;
 2. The vehicle's OBD system reports an active and/or permanent diagnostic trouble code (DTC);
 3. The vehicle's OBD system data indicates the system has not yet been sufficiently operated to determine the presence or absence of a DTC;
 4. The OBD system data is inconsistent with the OBD data profile for the manufacturer, make, and/or model year of the vehicle being inspected; or
 5. The OBD system data does not match the original equipment manufacturer (OEM) or a CARB exempted OBD software configuration.
- (D) During a referee or in-person field inspection for an OBD-equipped vehicle, in addition to the conditions specified above in section (III)(c)(1)(C), the following inspection conditions shall also result in a failed inspection if one or more occur:
1. The vehicle's MIL does not illuminate when the ignition is on and the engine is off;
 2. The vehicle's MIL illuminates continuously or flashes with the engine running.
- (2) Non-OBD vehicles. If a vehicle is not equipped with OBD, the following submission and inspection requirements apply:
- (A) Vehicles shall demonstrate compliance by having a smoke opacity test performed, as well as a visual inspection of the vehicle's emissions control equipment as specified in section (VII).
- (B) Other than testing required to be completed by an authorized referee, non-OBD vehicle inspections specified in this chapter shall be performed by a HD I/M approved tester.
- (C) SAE J1667 opacity test
1. Smoke opacity inspections shall be performed using the test procedures set forth in SAE Recommended Practice J1667 "Snap-Acceleration Smoke Test Procedure for Heavy-Duty Diesel Powered Vehicles," as issued February

1996 (“1996-02”), which is incorporated herein by reference.

2. The test procedure shall consist of preparation, preconditioning, and test phases:
 - a. In the preparation phase, the tester shall ensure the vehicle is placed at rest, verify that the transmission is placed in neutral, and ensure the vehicle wheels are properly restrained to prevent any rolling motion, in accordance with specifications in SAE procedure J1667, section 5.1 (February 1996).
 - b. In the preconditioning phase, the tester shall perform at least three preliminary snap acceleration test cycles on the vehicle using the sequence described in SAE procedure J1667, section 5.3 (February 1996). Prior to conducting smoke measurements, the zero and full-scale readings of the smoke meter shall be verified by the tester in accordance with specifications in SAE procedure J1667, section 5.4.2 (February 1996).
 - c. In the test phase, the tester shall put the vehicle through three snap-acceleration test cycles.
 - d. The tester shall measure the opacity during the preconditioning and test phases with a smoke meter and shall record the opacity measurements during each snap acceleration test cycle.
 - e. The smoke test opacity level to determine the compliance with section (III)(c)(2)(E) shall be the average of the corrected maximum 0.5-second average smoke values from the three snap-acceleration test cycles.

(D) Smoke meter requirements

1. The smoke meter shall consist of a full flow end-of-line or a sampling type smoke meter, a data-processing unit, and a printer and/or electronic storage medium to record and output the test results.
2. The smoke meter shall comply with the specifications provided in the SAE procedure J1667, “Snap-Acceleration Smoke Test Procedure for Heavy-Duty Powered Vehicles,” February 1996, section 6, which is incorporated herein by reference, and shall be calibrated in accordance with specifications in SAE procedure J1667, section 7.
 - a. The data-processing unit shall be capable of performing the functions described in SAE procedure J1667, Appendices A and C (February 1996)

(E) Smoke opacity inspection passing criteria

1. Smoke opacity test results must not exceed the applicable opacity limits as specified below.
 - a. 5% for any heavy-duty vehicle powered by a 2007 or subsequent model-year diesel engine.
 - b. 5% for any heavy-duty vehicle required to be equipped or retrofitted with a Level 3 VDECS, regardless of its diesel engine model-year.
 - c. 20% for any heavy-duty vehicle equipped or retrofitted with a Level 2 VDECS, regardless of its diesel engine model-year.
 - d. 20% for any heavy-duty vehicle powered by a 1997 to 2006 model-year diesel engine.
 - e. 30% for any heavy-duty vehicle powered by a 1991 to 1996 model-year diesel engine.
 - f. 40% for any heavy-duty vehicle powered by a pre-1991 model-year diesel engine.
 - g. Vehicles equipped with off-road engines that use those engines for motive power on the roadway, including, but not limited to, single engine and two engine cranes, must meet the opacity standard of XXX%, equivalent to their engine certification tier level.

(F) SAE J1667 Opacity Test Submission Requirements

1. For each vehicle subject to the requirements for smoke opacity inspections, the following data are required to be submitted:
 - a. VIN
 - b. The initial smoke test opacity levels (for three successive test readings) and the SAE J1667 standards including the average of the three snap-acceleration test cycles and the range.
 - c. The name and tester identification number of the HD I/M approved tester who performed the smoke opacity inspection.
 - d. Smoke meter brand name, make, model
 - e. The dates of the last calibration of the opacity meter
 - f. Test date
2. Data Submission Options
 - a. Electronic submission: Opacity test data may be electronically submitted to the reporting system via a file format approved by the Executive Officer.
 - b. Manual submission: Opacity test data may be entered manually to the reporting system via a method approved by the Executive Officer.

- A legible copy of the SAE J1667 opacity test strip generated per the requirements of this section and signed by the tester shall also be uploaded to the reporting system via a method approved by the Executive Officer.

(G) Visual Inspection Submission Requirements

- a. A completed inspection form provided by the Executive Officer shall be submitted to the electronic reporting system certifying that an inspection was completed as outlined in section (VII) and that the emission control components are in the manufacturers approved configuration.

(3) Required frequency of periodic data submission

(A) Starting January 1, 2024, vehicles subject to the requirements of this chapter shall periodically submit inspection data to a reporting system approved by the Executive Officer through one of the submission options specified in section (III)(c)(1) for OBD-equipped vehicles or section (III)(c)(2) for non-OBD vehicles at the following standard frequency interval:

1. OBD-equipped vehicles: Unless the vehicle meets one of the criteria in 2 through 4 below, a vehicle owner or designee of the vehicle owner shall submit a passing OBD data test on a quarterly basis during each compliance year.
 - a. Quarters shall be defined as ending on a vehicle's expiration day in months three, six, nine, and twelve of a given compliance year. For example, if a vehicle's compliance year is 02/22/2025 through 02/21/2026, quarters shall end on 05/21/2025, 08/21/2025, 11/21/2025, and 02/21/2026.
 - b. A passing OBD test shall be required to be submitted within 45 days prior to a vehicle's quarterly deadline to meet the periodic testing requirements.
2. Any vehicle incorporating the global positioning system (GPS) submission option specified in (VIII)(c)(4)(C)(5) into its certified CC-ROBD OBD data submissions shall be exempt from a given periodic inspection submission deadline if the vehicle has not entered California since its last compliant periodic data submission.
3. Non-OBD vehicles: A vehicle shall submit a passing opacity inspection and passing visual inspection every six months during its compliance year.
 - a. Submission deadlines shall be defined as ending on a vehicle's expiration day in months six and twelve of a given compliance year. For example, if a vehicle's compliance year is 02/22/2025 through 02/21/2026,

- data submission deadlines shall end on 08/21/2025 and 02/21/2026.
- b. Passing tests shall be required to be submitted within 45 days prior to a vehicle's deadline to meet the periodic compliance testing requirements.
4. OBD-equipped and non-OBD vehicles meeting the following criteria shall be subject to alternative periodic submission intervals as specified:
- a. Vehicles designated as low-use vehicles in the Truck and Bus Regulation, title 13, CCR, 2025, shall be required to submit periodic emissions test data annually and must demonstrate compliance by submitting a passing applicable periodic test within 90 days of the end of a vehicle's compliance year.
 - b. Partial year registration vehicles that operate no more than six months out of the year shall be required to submit periodic emissions test data annually and must demonstrate compliance by submitting a passing applicable periodic test as specified in this section within 90 days of the end of a vehicle's compliance year.
 - If a partial registration vehicle is determined to operate outside their declared DMV operation months, the vehicle shall be cited for non-compliance and be removed from the partial year registration designation for purposes of this section and subject to the standard periodic inspection frequencies as specified in sections (III)(c)(3)(A)(1) through (4).
 - c. Motor homes shall be required to submit annual periodic emissions testing data and must demonstrate compliance by submitting a passing applicable periodic test within 90 days of the end of a vehicle's compliance year.
- (d) Temporary vehicle exemptions
- (1) Vehicles operating on a three-day pass
 - (A) Vehicles operating on a three-day pass are exempt from submitting the periodic test data specified in section (III)(c) and the requirements of holding a valid compliance certificate, section (III)(e), for the specified three-day period of the pass.
 - (B) Vehicles are eligible to apply for a HD I/M three-day pass prior to travelling to California once per calendar year. A three-day pass must be obtained from the Executive Officer in the electronic reporting system.

(C) Prior to operating in California, the owner must obtain written approval from the Executive Officer, which must be carried within the vehicle at all times while operating in California during the specified time frame and presented to a peace officer or inspector upon request.

(e) Compliance Certificate

(1) On or after July 1, 2023, a vehicle owner shall have a valid compliance certificate to operate in California

(A) A valid compliance certificate must be kept inside the vehicle at all times in a location that is accessible to be able to present during inspections.

(B) Upon request from a peace officer or inspector, the vehicle operator shall present a valid compliance certificate for the vehicle(s) under inspection.

(2) Except as indicated in (A) below, a compliance certificate shall be valid for the length of the periodic test interval.

(A) Compliance certificates obtained prior to July 2023 shall be valid through a vehicle's DMV registration month in 2024.

(3) A compliance certificate shall be issued to the registered owner of the vehicle if the compliance fee has been paid and the vehicle has demonstrated compliance in accordance with the requirements of this chapter.

(4) A compliance certificate shall contain the following information:

(A) Date of issuance

(B) Date of expiration

(C) Registered owner name

(D) Registered company address

(E) Registered owner mailing address

(F) Vehicle VIN

(G) License plate

(H) Vehicle information including the vehicle year, make, and model

(5) A compliance certificate may be revoked if the vehicle is determined to possess tampered emissions control components. Such a vehicle shall not be allowed to operate in California until the vehicle successfully passes a referee inspection, clears any citations, and obtains a new compliance certificate.

(6) A compliance fee of \$XX shall be assessed with the issuance of a compliance certificate.

(A) Full payment is required at the time the compliance certificate is ordered.

(B) Sales tax shall not be assessed on the cost of certificates.

- (C) The compliance fee shall be annually adjusted to reflect changes in the California Consumer Price Index (CCPI) as published by the Department of Industrial Relations. Each annual fee adjustment shall be made based on the change in the CCPI ending in June of a given year.
- (f) Requirements for vehicles that are detected by emission screening devices. All heavy-duty vehicles operating within the State of California are subject to emissions compliance screening to identify vehicles operating above predetermined emissions thresholds. The emissions thresholds shall be set at a level indicating that the screened vehicle is likely operating with emission control components that are defective, tampered, or malmaintained.

(1) Thresholds.

[THIS SECTION IS STILL UNDER DEVELOPMENT BY CARB STAFF.]

(2) Emission Screening Devices.

Emission screening devices and technology can include, but are not limited to, remote emission sampling systems that measure emission levels and/or receive remote, automated downloads of onboard diagnostic systems data of vehicles that pass through the systems that may reflect defective, tampered or malmaintained emission control systems needing service.

(3) Vehicles Identified as High Emitters.

Owners of identified high emitting vehicles shall receive a Notice to Correct requiring proof of retesting and submission of documentation demonstrating compliance via a testing method specified in section (III)(c)(1) for OBD vehicles or the testing methods specified in section (III)(c)(2) for non-OBD vehicles.

(g) Requirements for vehicles referred to referee testing

- (1) A vehicle owner that has a vehicle required to submit to a referee test shall complete and pass the test within the time frame specified in (A) and (B) below:
- (A) Within 45 days of the request, unless the vehicle meets the criteria in section (III)(g)(1)(B).
- (B) For vehicles that submit GPS data as specified in section (VIII)(c)(4)(C)(5) and are outside California, 45 days or within three days of first reentering California, whichever is later.
- (2) A CARB-authorized referee tester shall conduct the referee test. Referee services shall be required for the inspection of a vehicle in one or more of the following circumstances:

- (A) The vehicle owner disputes the results of a test inspection or compliance determination and is seeking an independent evaluation;
 - (B) The physical or operational design or the vehicle's condition presents unusual inspection circumstances and/or inspection incompatibilities;
 - (C) A law enforcement agency requests a referee inspection for the vehicle;
 - (D) The Executive Officer directs a vehicle to a referee station for one of the following reasons:
 - 1. Vehicle has submitted test data that is inappropriate for the vehicle being tested
 - 2. Vehicle is identified as a suspected high emitter
 - 3. Vehicle is suspected of operating with tampered emission control components
 - 4. Vehicle has failed to submit required testing data
 - 5. Vehicle test is required for auditing, program validation purposes and/or demonstration of correction as outlined in section(X)(c)(3).
 - (E) The vehicle has an engine or emission control configuration that does not meet the original certified configuration required by United States Environmental Protection Agency or CARB upon initial sale of the vehicle. Such vehicles include, but are not limited to, the following:
 - 1. Vehicles equipped with an engine change
 - 2. Vehicles equipped with an alternative fuel retrofit system.
- (3) Referee testing and inspection requirements. The referee tester shall inspect the vehicle to determine if its emissions control system has been tampered with, inadequately maintained, and/or is defective. The inspection shall include the following:
- (A) *Visual and Functional Inspections* as specified in section (VII).
 - (B) *OBD data inspection* on applicable vehicles through the use of a certified OBD testing device registered to an authorized referee as specified in section (III)(c)(1).
 - (C) *Opacity test*. Vehicles must meet the allowable levels of smoke opacity as specified in section (III)(c)(2)(E).
- (4) Referee services shall be free of charge to vehicle owners, except when conducted per section (III)(g)(2)(A).
- (h) General emission control component requirements

(1) Emission Control Label.

- (A) No 1974 or newer heavy-duty vehicle shall operate in California without evidence that, at the time of manufacture, the installed engine met emission standards at least as stringent as applicable federal emission standards for the model year of the engine. An inspector shall base its determination on whether an engine meets the above requirements by inspecting the emission control label (ECL) affixed to the vehicle's engine.
- (B) If the vehicle owner fails to comply with this requirement, it will be conclusively presumed that the vehicle with a missing emission control label will be subject to, but not limited to, the following:
 - 1. The five percent smoke opacity standard in section (III)(c)(2)(E).
 - 2. OBD and MIL requirements as outlined in section (III)(c)(1).

(2) Manufacturer Configuration.

All engine and emission control components must be in the certified original manufacturer configuration for the applicable engine family number, as specified by the applicable Executive Order.

IV. Responsibilities of the Driver and Inspector During In-Person Field Inspections

(a) Driver of heavy-duty vehicle.

The driver of a heavy-duty vehicle selected to undergo the inspection procedure shall do all of the following actions, as applicable:

- (1) Drive the vehicle to the inspection site upon direction of an officer, if applicable.
- (2) Show proof of driver's license, vehicle registration, and compliance certificate to the inspector or officer upon request.
 - (A) All vehicles operating in California will remain subject to inspection requirements regardless of the possession of a compliance certificate
- (3) Permit the inspector to perform the visual inspection, functional inspection and test procedures as specified in section VII.
- (4) Open the vehicle door so that the inspector may:
 - (A) Observe the driver depress the accelerator pedal, upon request
 - (B) Access data link connector to perform an OBD download
 - (C) Observe the status of the malfunction indicator light (MIL)
- (5) Permit an emissions control system inspection and open the engine compartment of the vehicle upon the request of the inspector.
- (6) As applicable, sign the Notice to Correct and/or the Citation to

acknowledge its receipt and sign the smoke test report to acknowledge performance of the test procedure.

(b) Inspector

The inspector conducting the inspection procedures shall do all of the following:

- (1) Advise the driver that refusal to submit to the test procedure or inspection is an admission constituting proof of a violation.
- (2) Request driver's license, vehicle registration, temporary operating permit if applicable, and compliance certificate
- (3) Obtain all pertinent engine identification information from the vehicle.
- (4) Conduct all necessary and applicable inspection components as specified in section (VII).
- (5) As deemed necessary, issue a Notice to Correct or a Citation to the driver of a vehicle that fails to meet the requirements established by this regulation.

V. Requirements for HD I/M Approved Testers

[THIS SECTION IS STILL UNDER DEVELOPMENT BY CARB STAFF.]

- (a) Obtain a tester identification number through CARB by submitting a copy of a certificate of completion from a CARB-approved training course by a third party vendor.
- (b) The tester must submit test information to the electronic reporting system approved by the Executive Officer using a verified account.
 - (1) Any data submitted through this account is the sole responsibility of the account holder.

VI. Requirements for Freight Contractors

- (a) A Freight Contractor shall not hire or dispatch a heavy-duty vehicle subject to the requirements of this chapter for operation in the State of California unless the vehicle is compliant with the following requirements, as applicable:
 - (1) The Heavy Duty vehicle has a current and valid compliance certificate.
 - (2) Notwithstanding requirement (1), a Freight Contractor may hire and dispatch a Heavy duty vehicle if one of the following applies:
 - (A) The Heavy Duty vehicle has been issued a valid and current temporary operating permit in accordance with (HSC 44152 (h)(2)).
 - (B) The Heavy Duty vehicle is considered exempt from this chapter.
- (b) A Freight Contractor shall check if a given Heavy Duty vehicle is compliant by verifying that the vehicle has a valid CARB compliance certificate or by entering identifiable vehicle information into the CARB electronic reporting system approved by the Executive Officer website.

VII. Inspection Processes

Inspectors, referees, and HD I/M approved testers are required by sections within this chapter to conduct visual and functional inspections. The inspection components may include, but are not limited to, all of the following:

[THIS SECTION IS STILL UNDER DEVELOPMENT BY CARB STAFF, AND FURTHER DETAIL INCLUDING DETAILS REGARDING THE INSPECTION FORM MAY BE ADDED IN SUBSEQUENT VERSIONS.]

(a) Visual Inspection Components

A visual inspection of the applicable vehicle and engine components shall ensure compliance with the requirements outlined in section (III)(h). This shall include, but is not limited to, the inspection of:

- (1) Any emissions-related components for a particular vehicle/engine as specified on the ECL, and determined from the manufacturer's specifications found in certification data, published vehicle parts manual, or executive orders
- (2) The presence and legibility of the emission control label
- (3) The presence of an illuminated malfunction indicator light (MIL)
- (4) The vehicle mileage as indicated by the odometer

(b) Functional Inspection Components.

A functional inspection of the applicable vehicle and engine components, must include, but is not limited to, the verification of:

- (1) The malfunction indicator light (MIL) bulbs operational status
- (2) The proper installation of any aftermarket parts
- (3) Any applicable test procedures outlined in Section (III)(c)

VIII. Requirements for Devices

(a) List of the referenced documents within Section VIII

- (1) Section 1971.1, title 13, CCR, "On-Board Diagnostic System Requirements - 2010 and Subsequent Model-Year Heavy-Duty Engines", 2019;
- (2) ISO 15031-4 "Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 4: External test equipment", 2014;
- (3) SAE J1699-2 "Test Cases for OBD-II Scan Tools and I/M Test Equipment", 2017;
- (4) SAE J1699-3 "Vehicle OBD II Compliance Test Cases", 2017;
- (5) SAE J1962 "Diagnostic Connector", July 2016 (SAE J1962);

- (6) SAE J1978 "OBD II Scan Tool – Equivalent to ISO/DIS 15031-4, April 2002 (SAE J1978);
- (7) SAE J1979 "E/E Diagnostic Test Modes", February 2017 (SAE J1979);
- (8) SAE J1979-DA "Digital Annex of E/E Diagnostic Test Modes", May 2019;
- (9) SAE J1979-DA "Digital Annex of E/E Diagnostic Test Modes", May 2019;
- (10) ISO 15765-4 "Road Vehicles-Diagnostics Communication over Controller Area Network (DoCAN) - Part 4: Requirements for emission-related systems", April 2016 (ISO 15765-4);
- (11) SAE J1939 Recommended Practice for a Serial Control and Communications Heavy Duty Vehicle Network – Top Level Document, August 2013;
- (12) SAE J1939-DA "Digital Annex of Serial Control and Communication Heavy Duty Vehicle Network Data," April 2019;
- (13) SAE J1939-3 "On Board Diagnostics Implementation Guide", 2015;
- (14) SAE J1939-13 "Off-Board Diagnostic Connector", October 2016;
- (15) SAE J1939-21 "Data Link Layer", March 2016; SAE J1939-71 "Vehicle Application Layer", October 2016;
- (16) SAE J1939-73 "Application Layer—Diagnostics", May 2017;
- (17) SAE J1939-81 "Network Management", March 2017;
- (18) SAE J1939-84 "OBD Communications Compliance Test Cases for Heavy Duty Components and Vehicles", October 2017; and
- (19) SAE J3005-1 "Permanently or Semi-Permanently Installed Diagnostic Communication Devices", 2019.
- (20) SAE J1979-2 "E/E Diagnostic Test Modes: OBD on UDS," May 2017 WIP (SAE J1979-2).

(b) General device requirements

- (1) The ROBD tool shall not interfere with the normal operation of the vehicle and/or any manufacturer- or third-party-installed tool in communication with vehicle's OBD system.
- (2) Any ROBD tool used for compliance purposes shall be capable of performing the following tasks (specific requirements of each task are provided in section (VIII)(c)):
 - (A) Establishing connection with the vehicle and verifying vehicle's support of HD OBD or OBD II at the individual ECU level;

- (B) Collecting the OBD data required to be submitted as part of the program; and
 - (C) Submitting data securely via a standardized data submission format to an electronic reporting database approved by the Executive Officer.
- (3) The ROBD tool shall request data from the ECUs indicating HD OBD or OBD II support, as specified in section (VIII)(c)(2).
 - (4) The ROBD tool shall timestamp each sent request and received response from the CAN Bus in the submitted data file, as specified in section (VIII)(c)(5).
 - (5) The ROBD tool shall be capable of receiving multiple responses when requesting information (either multiple controllers responding to a request or a controller responding multiple times to a request).
 - (6) The ROBD tool shall not send a code clear command.
 - (7) The NCC-ROBD tool shall meet the requirements of both SAE J1939 and SAE J1979 OBD protocols¹.
 - (8) The ROBD tool shall insure that the vehicle's OBD data link Bus is not disturbed and placed in a Bus-passive, Bus-off, or other similar error condition during the protocol detection process.
 - (9) The ROBD system shall execute all the tasks specified in sections (VIII)(b) and (VIII)(c) automatically without any human interaction.
- (c) Specific device requirements
- This section provides detailed specifications of ROBD tools/systems that meet CARB HD I/M requirements. The specifications apply to both CC-ROBD and NCC-ROBD tools, unless indicated otherwise.
- (1) Diagnostics connector
 - (A) The CC-ROBD tools may be installed permanently (hard-wired into the vehicle wire harness) or semi-permanently (plugged into an available OBD port in vehicle)
 - (B) The CC-ROBD tool shall be compliant with SAE J3005, J3005-1, J3005-2, ISO 15765-4, and ISO 15765-5.

¹ Upon adoption of the Unified Diagnostic Services (UDS) protocol, ROBD tools will be required to meet the requirements of this protocol as well. CARB will update this document in the future to account for the UDS protocol upon adoption.

(C) The NCC-ROBD tools developed to meet both SAE J1939 and SAE J1979 OBD protocols, as specified in section (VIII)(b)(8), shall be capable of mating to both the connectors defined in SAE J1962/ISO 15031-3 and to the SAE J1939-13 connector.

1. The J1979 ROBD tool shall meet the specified requirements in ISO 15765-4 for CAN where one or more controllers comply with OBD regulations.
2. The J1979 ROBD tool shall use the standard 16-pin type connector and communicate at 500 kilobits per second (kbps) baud rate.
3. The J1939 ROBD tool shall meet the requirements and guidelines in SAE J1939-3 for the implementation of OBD on heavy duty vehicles.
4. The J1939 ROBD tool shall use the standard 9-pin black connector and communicate at 250 kbps baud rate for 2013 – 2015 MY engines.
5. The J1939 ROBD tool shall use the standard 9-pin green connector and communicate at 500 kbps baud rate for 2016 MY and newer engines.

(D) Plug-in ROBD tools (i.e., NCC-ROBD and semi permanently CC-ROBD tools) shall use colored LED lights as specified below, to be used as visual indicators of communication/data collection/data transmission:

1. Flashing red light (one flash per 3 seconds for a 30-second duration) to indicate failed ROBD tool-vehicle communication, as specified in section (VIII)(c)(2)(C)(2), and/or vehicle not supporting the relevant OBD requirement, as specified in section (VIII)(c)(2)(D).
2. Flashing yellow light (one flash per second) to indicate OBD data collection from vehicle is in progress. The light shall extinguish upon completion of data collection.
3. Flashing blue light (one flash per 2 seconds) to indicate data transmission from the ROBD tool is in progress. The light shall extinguish upon completion of data transmission.

4. Solid green light to indicate a successful data transmission. The light shall extinguish after 10 seconds.

(2) Communication with vehicle

(A) SAE J1939 tool

1. The ROBD tool shall meet the standardized communication requirements as illustrated in SAE J1939-84.
2. The ROBD tool shall comply with SAE J1939-21 and SAE J1939-71 when connected to a SAE J1939 vehicle.
3. The ROBD tool shall meet all the requirements in SAE J1939-3, Section 4.
4. The ROBD tool shall act as a client for SAE J1939-73 (Table 1) diagnostics services provided by vehicle network.
5. The ROBD tool shall follow the requirements in J1939-3, Section 7 to ensure the proper initialization as a client for diagnostic services on a vehicle using SAE J1939 for OBD communications.
 - a. Address claim: The ROBD tool shall meet address claim and dynamic addressing requirements in SAE J1939-81 to avoid address conflicts in cases where multiple tools communicate on the CAN Bus at the same time.
 - b. Verifying HD OBD compliance: The ROBD tool shall send a global DM5 request as outlined in SAE J1939-3.
 - c. The ROBD tool shall confirm HD OBD compliance after successful completion of the address claim process and receiving DM5 support response(s) from one or more onboard ECUs.
6. The ROBD tool initialization shall be performed prior to requesting diagnostic services from any ECU.

7. Identifying the available data: The ROBD tool shall send destination-specific requests for DM24 message to all HD OBD compliant ECUs identified, as described in section (VIII)(c)(2)(A)(5)(c), and record all the received responses.
 - a. As described in SAE J1939-71, the ROBD tool shall refrain from requesting data that is routinely broadcast on the network.

(B) SAE J1979 tool

1. The ROBD tool shall be compliant with SAE J1979.
2. The ROBD tool shall communicate with the vehicle OBD system using the signaling standard, and meeting the timing requirements, of ISO 15765-4.
3. The ROBD tool shall meet the standardized communication requirements for scan tools as illustrated in SAE J1699-3.
4. The ROBD tool shall meet the requirements in SAE J1978/ISO 15031-4 and SAE 1699/2 to avoid disturbing the in-vehicle communication.
5. The ROBD tool shall meet the requirements in SAE J3005-1 for permanently or semi-permanently installed diagnostic communication devices.
6. The ROBD tool shall utilize the initialization sequence of ISO 15765-4 in order to establish communication before sending diagnostic requests.
7. Identifying the available data: The ROBD tool shall record all responses, including CAN source (i.e. specific ECU), to a Mode \$01 PID \$00, \$20, \$40, etc. requests sent during initialization.
8. The ROBD tool shall conduct an analogous scan for available Monitor IDs (MIDs) in Mode \$06 (MID \$00, \$20, etc.)
9. The ROBD tool shall conduct an analogous scan for available InfoTypes in Mode \$09.

(C) In the case of failed initialization (i.e., vehicle not responding to the ROBD tool within the required duration), the ROBD tool shall repeat the initialization sequence, up to three times.

1. The ROBD tool shall meet the response time requirements as outlined in SAE J1939-73 and SAE J1979.
2. After the third failed initialization attempt, the ROBD system shall notify the vehicle driver and owner of the failed communication between the ROBD tool and the vehicle.
 - a. For plug-in ROBD tools, the vendor shall notify the vehicle driver of the failed communication via LED lights on the ROBD tool, as specified in section (VIII)(c)(1)(D).
 - b. The CC-ROBD tool vendor may choose different means of communication (text message, e-mail, mail, etc.) to notify the vehicle owner of the failed ROBD tool-vehicle communication.
3. The ROBD system shall submit a “Failed Communication” message to electronic reporting system approved by the Executive Officer, in the format specified in section (VIII)(d)(7).

(D) In the case of vehicle not supporting the relevant OBD requirement (HD OBD or OBD II) following an initialization sequence, the ROBD tool shall repeat the initialization sequence up to three times.

1. If all initialization attempts confirm the initial results, the vendor shall notify the vehicle driver (and owner, for CC-ROBD tools), as specified in section (VIII)(c)(2)(C)(2).
2. The ROBD system shall submit a “Vehicle not HD OBD/OBD II compliant” message to the CARB electronic reporting system approved by the Executive Officer, in the format specified in section (VIII)(d)(7).

(3) Collecting the required OBD data from vehicle

(A) The ROBD tool shall be capable of collecting all the data required by CARB HD OBD regulation (section 1971.1, title 13, CCR) and specified in sections (h)(4) and (h)(5) (see Table A1 in section (VIII)(d) for more detail).

- (B) The J1939 ROBD tool vendors can refer to Table 1 in SAE J1939-73 and SAE J1939 Digital Annex spreadsheet for more detailed information on requesting the data including the Parameter Grouping Number (PGN) and Suspect Parameter Number (SPN) of the parameters.
 - (C) The J1979 ROBD tool vendors can refer to Tables A1-A4 in SAE J3005-1 and SAE J1979 Digital Annex spreadsheet for more detailed information on requesting the data including the service modes, PIDs, MIDs, and InfoType data.
 - (D) In addition to the data required by the HD OBD regulation and specified in this section, the ROBD tool shall provide details of data collection (e.g., date/time of the data collection and ROBD tool unique hardware and software identifiers, etc.), as specified in section (VIII)(c)(5).
- (4) Checking for OBD key events (specific to CC-ROBD tools)
- (A) Within five minutes of every engine start, the CC-ROBD system shall collect the necessary data for a key event check and execute the check to determine if an OBD key event has occurred.
 - 1. The vendor may choose to assign the data collection task to the CC-ROBD tool and execute the key event checks at the database level, or execute both tasks at the tool level.
 - (B) The CC-ROBD system shall be capable of running both “basic” and “full” OBD key event checks, as defined in (VIII)(c)(4)(C) and (VIII)(c)(4)(D).
 - 1. The vendor shall activate either the basic or full OBD key event check functionality as per the request from the vehicle owner.
 - (C) Full OBD key event check: The CC-ROBD system shall be capable of executing all the following checks within five minutes of every engine start and determining if changes (as specified) since the last key event check have occurred:
 - 1. Tool power loss: The CC-ROBD system shall be capable of detecting any loss of power between vehicle and the CC-ROBD tool since the last check.
 - 2. MIL status change (item #4 in Table A1): The CC-ROBD system shall be capable of detecting any

- change in the MIL status (i.e., MIL has been turned on or off since the last check).
3. Electronic identifiers of the vehicle and its OBD system: The CC-ROBD system shall be capable of detecting any change in the following parameters since the last check:
 - a. E-VIN (item #8 in Table A1)
 - b. Engine serial number and ECU names/IDs (items #9 and #10 in Table A1)
 - c. Software CAL IDs and CVNs (items #6 and #7 in Table A1)
 4. Readiness (item #1 in Table A1): The CC-ROBD system shall be capable of detecting any change from “Ready” to “Not Ready” in the readiness status of the supported OBD monitors.
 5. Entering/exiting California (GPS-based method): The CC-ROBD system shall be capable of identifying if the vehicle has entered or exited California (CA) since the last key event check through CA state geofence parameters.
 - a. The vendor shall activate this feature after receiving consent from the vehicle owner.
 - b. The CC-ROBD system shall collect the data, as specified in sections (VIII)(c)(3) through (VIII)(c)(6), and submit it to the CARB HD I/M reporting system upon identifying the vehicle has entered CA in the first key event check subsequent to entry into the state.
 - c. Upon exiting CA, the CC-ROBD system shall submit a message to the CARB HD I/M reporting system, as specified in section (VIII)(c)(5), stating that the vehicle has left CA.
 - d. The CC-ROBD system is not required to collect and submit the complete data specified in (VIII)(c)(3) when the vehicle is outside CA.

- (D) Basic key event check: The CC-ROBD system shall only execute the mandatory tool power loss check, as specified in section (VIII)(c)(4)(C)(1), and the optional California entry/exit check, as specified in section (VIII)(c)(4)(C)(5).
 - (E) Upon identifying an OBD key event, the CC-ROBD system shall collect and submit the required data to the CARB HD I/M reporting system, as specified sections (VIII)(c)(3) through (VIII)(c)(6).
 - (F) The CC-ROBD system shall automatically submit the required OBD data, as specified in sections (VIII)(c)(3) through (VIII)(c)(6), within the allowable submission window prior to a vehicle's periodic submission deadline.
 - 1. Vehicles optioning into the GPS-based key event option, as specified in section (VIII)(c)(4)(C)(5), are exempt from the requirement to submit OBD data at the regular periodic inspection submission deadline if they have been operating outside of CA for the duration of this timeframe.
- (5) Formatting the collected OBD data
The ROBD system shall meet the following data format specification for submitting the collected data.
- (A) File extension: The file shall be a standard ASCII text file with a ".csv " extension, that is compatible with Notepad, Microsoft Excel/Word 2019 or newer version.
 - (B) File name: The ROBD system software shall generate a 16-character GUID for the file name. All characters shall be ASCII 48-57 and 97-122 and have the text "_hdim" appended at the end of the GUID.

Examples:
b8ac348cd69d6d10_hdim.csv
81a150dtbd5d56n2_hdim.csv
 - (C) File structure: The file shall consist of two sections: the data header, and the CAN Bus data in hexadecimal format.
 - (D) Data header
 - 1. The data header shall have two rows: The first row shall contain the data field names for the header data,

and the second row shall contain the values for the header data fields.

2. A comma (,) shall separate each data field name or value.
3. The data header shall be in ASCII text format and contain the fields listed in Table 1.

Table 1. Contents of the header section of the submission file

Data Field Name	Description of Data	Data Type (length)
VIN	Vehicle identification number located on the tested vehicle in CARB-specified format	String (17)
Protocol	Vehicle's OBD communication protocol (SAE J1939/J1979)	String (5)
Odometer*	Odometer reading of the vehicle at the time the OBD data is downloaded from the vehicle OBD system	Integer (7)
Device Name	The manufacturer (make) of the ROBD tool	String (50)
Device Unique Identification Number	The unique identification number of the ROBD tool in CARB-specified format	String (20)
Device Firmware Number	The firmware/version number of the software in the ROBD tool	String (20)
Record ID	A unique value from an ascending numerical sequence assigned by the ROBD tool to each submission	Integer (7)
CA Exit	The value indicates if the vehicle has exited CA. 1=exited CA, 0=inside CA	bit
Event Code	The CARB-assigned code of the key event that triggers the OBD data submission	Integer (1)
Data Collection Date and Time	The timestamp at the time the ROBD tool starts downloading OBD data from the vehicle OBD system. The timestamp is in pacific standard time (PST) and in the format of YYYY-MM-DD HH:MI:SS	datetime

* For pre-2024 MY engines that are not required by the HD OBD regulation to provide odometer reading, the ROBD tool shall obtain this parameter through other means.

(E) CAN Bus Data

1. The first row in the CAN Bus data section (the third row from the beginning of the file) shall be the data field names of the OBD data.
2. The CAN Bus data as collected from the vehicle shall start from the fourth row of the submission file.
3. A comma (,) shall separate data field names and values.
4. Each message shall have its own individual row.
5. The J1979 ROBD tool shall follow the formatting specification in Table 2 for the CAN Bus data section of the submission file (see section (VIII)(d) for an example submission file format).

Table 2. CAN Bus data formatting requirements for the J1979 ROBD tool

Data Field Name	Description of Data	Data Type (length)
Timestamp	The time that a message is sent from the ROBD tool to the vehicle or received from the vehicle. The timestamp is in pacific standard time (PST) and has millisecond precision. The timestamp is in the format of YYYY-MM-DD HH:MM:SSSS.	Datetime
Message Type	The message type of the data line. It indicates if the message was sent from the OBD tool to the vehicle or received from the vehicle. "REQ" is the request messages sending to the vehicle, and "RSP" is the response messages received from the vehicle.	String (3)
ECU Address	The hexadecimal address of the ECUs that respond to the request. The REQ messages will not have an ECU address. The RSP messages will have the hexadecimal address of the responding ECUs.	String (2)
Message Data	The data portion of the CAN message sent to or received from the vehicle's OBD system. The data shall be ASCII text that represents the hexadecimal values.	String (50)

6. The J1939 ROBD tool shall follow the formatting specification in Table 3 for the CAN Bus data section

of the submission file (see section (VIII)(d) for an example submission file format).

Table 3. CAN Bus data formatting requirements for the J1939 ROBD tool

Data Field Name	Description of Data	Data Type (length)
Timestamp	The time that a message is sent from the ROBD tool to the vehicle or received from the vehicle. The timestamp is in pacific standard time (PST) and has millisecond precision. The timestamp is in the format of YYYY-MI-DD HH:MM:SSSS.	Datetime
Message Type	The message type of the data line. It indicates if the message was sent from the ROBD tool to the vehicle or received from the vehicle. "REQ" is the request messages sending to the vehicle, and "RSP" is the response messages received from the vehicle.	String (3)
CAN ID	CAN ID	String (10)
Message Data	The data portion of the CAN message sent to or received from the vehicle's OBD system. The data shall be ASCII text that represents the hexadecimal values.	String (50)

(F) Upon leaving California, the CC-ROBD system shall submit a file containing only the header section and the "CA Exit" field set to "1" (see section (VIII)(d)(4) for an example).

(G) The NCC-ROBD tools shall report "NA" for the values of "CA Exit" and "Event Code" fields in the header (see sections (VIII)(d)(5) and (VIII)(d)(6) for examples).

(6) Transmitting the collected data to the CARB electronic reporting system approved by the Executive Officer.

(A) Connection and authentication:

1. The serial number of the ROBD tool shall be registered in the electronic reporting system approved by the Executive Officer as a valid testing tool in order to receive authentication to submit data to the electronic reporting system approved by the Executive Officer.
2. The ROBD system shall supply a Client-Side Secure Sockets Layer (SSL) Certificate. This certificate validates the authenticity of the client with an

- administrative mechanism for loading/validating client certificates.
3. CARB will obtain and maintain a Server-Side SSL Certificate. This certificate validates the authenticity of the electronic reporting system approved by the Executive Officer server and to establish the HTTPS encryption for privacy.
- (B) Data transfer protocol: The data files shall be submitted to the CARB electronic reporting system approved by the Executive Officer from the ROBD system via HTTPS with the POST method.
1. The HD I/M program shall provide an URL for data acceptance.
- (C) Data integrity:
1. The data shall not be altered or tampered with during or prior to electronically submitting to the CARB electronic reporting system approved by the Executive Officer.
 2. The data file shall be transmitted securely from the ROBD system to the CARB electronic reporting system approved by the Executive Officer.
 3. The data shall be encrypted when sending from the ROBD system to the CARB electronic reporting system approved by the Executive Officer.
- (D) Once an internet connection is available, the ROBD system shall submit the encrypted data files to the CARB electronic reporting system approved by the Executive Officer. The internet connection can be satellite, cellular network, Wi-Fi, hot spot, etc.
- (E) Internal data storage:
1. The ROBD tool shall have enough internal storage capacity to store the retrieved data that have not been submitted due to unavailable internet connection.
 2. The ROBD system shall retain the collected OBD data, either in the internal memory of the ROBD tool or in their proprietary database, for at least seven days following a successful submission to the CARB electronic reporting system approved by the Executive Officer.

(d) Data Fields and Submission Examples

(1) Table A1 contains more information about the OBD data requirements of the HD I/M.

Table A1. Additional information about the HD I/M OBD data requirements

Item	Data Type	Corresponding Section in CARB HD OBD Regulation (CCR Title 13, Section 1971.1)	Relevant Diagnostic Message(s) in Each OBD Protocol		Comments
			J1939	J1979	
1	Readiness status of all OBD monitors listed in sections (e) and (g)	(h)(4.1)	DM5, DM21, DM26	Mode \$01 PID \$01	
2	All data stream parameters	(h)(4.2.2) and (h)(4.2.3)	See SAE J1939DA for PGNs and SPNs	Mode \$01, see SAE J1979DA for PIDs	
3	Freeze frame data	(h)(4.3)	DM25	Mode \$02	
4	Fault codes including active, pending, and permanent	(h)(4.4)	DM1, DM6, DM12, DM23, DM28, DM29	Modes \$03, \$07, \$0A	The J1939 ROBD tool shall also be capable of collecting the previously active fault codes
5	Monitoring support status and test results	(h)(4.5)	DM24, DM30	Mode \$06	
6	Software calibration ID (Cal-ID)	(h)(4.6), (h)(4.7)	DM19	Mode \$09 InfoType \$04	

7	Calibration Verification Number (CVN)			Mode \$09 InfoType \$06	
8	VIN	(h)(4.8)	PGN: 65260 SPN: 237	Mode \$09 InfoType \$02	
9	Engine serial number	(h)(4.8)	PGN: 65269 SPN: 588	Mode \$09 InfoType \$0D	
10	ECU name	(h)(4.9)	PGN: 60928 SPN:2848	Mode \$09 InfoType \$0A	
11	Monitor in-use performance ratio	(h)(5.1)	DM20	Mode \$09 InfoType \$0B	
12	Engine run time tracking data	(h)(5.2)	See SAE J1939DA for PGNs and SPNs	Mode \$01, see SAE J1979DA for PIDs	
13	NOx emissions tracking data	(h)(5.3)	PGNs: 64258 thru 64279	Mode \$09 InfoTypes \$61 - \$76	For all 2022 and subsequent model year diesel engines
14	GHG tracking data	(h)(5.4) - (h)(5.6)	PGNs: 64252 thru 64257	Mode \$09 InfoTypes \$41 - \$49, \$50 - \$5B	For all 2022 and subsequent model year engines
15	PM filter regeneration event data	(h)(5.8)	See SAE J1939DA for PGNs and SPNs	See SAE J1937DA for PGNs and SPNs	

(2) Example of a submission file format (CC-ROBD J1979 tool)

VIN,Protocol,Odometer,Device Name,Device Serial Number,Device Firmware Number,Record ID,CA Exit,Event Code,Data Collection Date and Time
1234567890ABCDEFGH,J1979,23000, ABC
Company,12345ABCDE,1.20.1005,23,0,2, 2024-06-25 12:23:4567
Timestamp, Message Type, ECU Address, Data Message
2024-06-25 12:23:4567,REQ,,686AF1 01 00
2024-06-25 12:23:4570,REQ,,07DF 01 00
2024-06-25 12:23:4588,RSP,10,07E8 41 00 BF BE A8 93
2024-06-25 12:23:4592,RSP,10,07EC 41 00 98 18 80 11
2024-06-25 12:23:4623,REQ,,07DF 01 01
2024-06-25 12:23:4712,RSP,10,07E8 41 01 00 07 65 00
2024-06-25 12:23:4800,REQ,07DF 01 20
2024-06-25 12:23:4811,RSP,10,07EC 41 20 80 01 80 01
2024-06-25 12:23:4823,RSP,10,07E8 41 20 A0 07 B1 19

(3) Example of a submission file format (CC-ROBD J1939 tool)

VIN,SAE Protocol,Odometer,Device Name,Device Serial Number,Device Firmware Number,Record ID,CA Exit,Event Code,Data Collection Date and Time
ABCDEFGHIJKL1234567890,J1939,51000,XYZ Company,ABCDE12345,1.21.1005,1
23,0,0, 2024-06-25 12:23:4567
Timestamp,Message Type,CAN ID,Data Message
2024-06-25 12:23:4567,REQ,18EA2117,EA FE 00
2024-06-25 12:23:4570,RSP,0CF00C03,00 FB 00 00 FF FF FF FF
2024-06-25 12:23:4588,RSP,18FEDF00,7D A0 28 7D 7D FF FF F0
2024-06-25 12:23:4592,REQ,18EA0017,CE FE 00
2024-06-25 12:23:4623,RSP,0CF00203,C0 00 00 FF F7 00 00 03
2024-06-25 12:23:4712,RSP,18FECE00,00 04 13 07 A0 1E 00 04
2024-06-25 12:23:4800,RSP,0CF00300,D1 00 00 FF FF 0F 72 7D
2024-06-25 12:23:4811,RSP,18FEF200,00 00 00 00 73 07 01 FF
2024-06-25 12:23:4823,RSP,18F00E00,FF FF FF FF FF FF FF FF

(4) Example of a submission file format (CC-ROBD tool on a vehicle which has left CA)

VIN,SAE Protocol,Odometer,Device Name,Device Serial Number,Device Firmw
are Number,Record ID,CA Exit,Event Code,Data Collection Date and Time
ABCDEFGH1234123412,J1939,125000,XYZ Company,ABCDE12345,1.21.1005,
53,1,0, 2024-06-25 12:23:4567

(5) Example of a submission file format (NCC-ROBD tool-J1939)

VIN,SAE Protocol,Odometer,Device Name,Device Serial Number,Device Firmw
are Number,Record ID,CA Exit,Event Code,Data Collection Date and Time
ABCDEFGH7878123412,J1939,85000,XYZ Company,AXCFD55345,1.21.1005,3
3,NA,NA, 2024-06-25 12:23:4567

Timestamp,Message Type,CAN ID,Data Message
2024-06-25 12:23:4567,REQ,18EA2117,EA FE 00
2024-06-25 12:23:4570,RSP,0CF00C03,00 FB 00 00 FF FF FF FF
2024-06-25 12:23:4588,RSP,18FEDF00,7D A0 28 7D 7D FF FF F0
2024-06-25 12:23:4592,REQ,18EA0017,CE FE 00
2024-06-25 12:23:4623,RSP,0CF00203,C0 00 00 FF F7 00 00 03
2024-06-25 12:23:4712,RSP,18FECE00,00 04 13 07 A0 1E 00 04
2024-06-25 12:23:4800,RSP,0CF00300,D1 00 00 FF FF 0F 72 7D
2024-06-25 12:23:4811,RSP,18FEF200,00 00 00 00 73 07 01 FF
2024-06-25 12:23:4823,RSP,18F00E00,FF FF FF FF FF FF FF FF

(6) Example of a submission file format (NCC-ROBD tool-J1979)

VIN,SAE Protocol,Odometer,Device Name,Device Serial Number,Device Firmw
are Number,Record ID,CA Exit,Event Code,Data Collection Date and Time
ABCDEFGH7878123412,J1979,85000,XYZ Company,AXCFD55345,1.21.1005,3
3,NA,NA, 2024-06-25 12:23:4567

Timestamp, Message Type, ECU Address, Data Message
2024-06-25 12:23:4567,REQ,,686AF1 01 00
2024-06-25 12:23:4570,REQ,,07DF 01 00
2024-06-25 12:23:4588,RSP,10,07E8 41 00 BF BE A8 93
2024-06-25 12:23:4592,RSP,10,07EC 41 00 98 18 80 11
2024-06-25 12:23:4623,REQ,,07DF 01 01
2024-06-25 12:23:4712,RSP,10,07E8 41 01 00 07 65 00
2024-06-25 12:23:4800,REQ,07DF 01 20
2024-06-25 12:23:4811,RSP,10,07EC 41 20 80 01 80 01
2024-06-25 12:23:4823,RSP,10,07E8 41 20 A0 07 B1 19

(7) Example of a submission file format (Failed OBD tool-vehicle communication or vehicle not HD OBD/OBD II compliant)

VIN,SAE Protocol,Odometer,Device Name,Device Serial Number,Device Firmware Number,Record ID,CA Exit,Event Code,Data Collection Date and Time
ABCDEFGH1234123412,J1939,125000,XYZ Company,ABCDE12345,1.21.1005,
53,0,0, 2024-06-25 12:23:4567
"Failed Communication" or "Vehicle Not HD OBD/OBD II Compliant"

IX. Requirements for Device Vendors

(a) Overview and Applicability

(1) Vendors, manufacturers, and/or service providers of devices submitting OBD data as part of for this chapter shall certify their devices to become the device Executive Order holder. Applicants submitting an OBD test device for certification shall submit the full and current configuration proposed for sale and consumer use for certification with this section.

(b) Submitting a certification application

(1) Applicant shall complete and submit device certification application forms approved by the Executive Officer and other required information for evaluation of the application.

(A) The application shall contain all information required of the applicant and shall be true, accurate, and include complete statements and information.

(B) An authorized representative of the company shall approve and sign the application.

(C) The application shall include the following information and shall be approved by the Executive Officer prior to CARB staff performing any verification testing specified in section (IX)(c)(2):

1. Description of the device
2. A detailed description of the design of the device and how the device is consistent with and meets the requirements specified in section VIII of this chapter
3. Device manufacturer if applicant is not the manufacturer of the device
4. Vehicle(s) makes and models that the device can be used on
5. Applicable OBD protocol(s) of the device

6. Applicant shall identify if they plan to update devices already in use in existing vehicle(s).
 7. A proposed test plan for finding applicable fleets/vehicles to test devices in the field to meet the vendor field testing requirements of section (IX)(c)(3) including expected testing locations and the estimated number of vehicles broken down by fleet, engine OEM, engine model year, vehicle make and model, fuel type, and OBD protocol. After CARB approves the test plan, any changes or deviations from the plan shall be reviewed and approved by CARB.
 8. A proposed timeline for completing the field-testing requirements specified in section (IX)(c)(3)
 9. Any additional information that may be necessary to help verify that the device meets the requirements of this section.
- (2) Applicant shall assign each device a unique identification number following the required format ABCNNNNNNN.
- (A) Where “ABC” is a CARB-assigned three alpha-numeric characters that uniquely identify the vendor, followed by seven numbers that start with 0000001 and increase sequentially with each additional device.
 - (B) Applicant shall obtain their assigned unique three alpha-numeric vendor identifier from the Executive Officer and include as part of their application package
- (3) Applicant shall provide a copy of the maintenance instructions and warranty statement that will be provided to the ultimate purchaser of the device as part of the certification application.
- (4) Applicant shall unconditionally certify that all the devices are built as described and comply with the requirements of title 13, CCR, **TBD**.

(c) Testing requirements for certification

The following certification testing shall be performed to demonstrate that the device meets the program requirements and shall be completed in the following phases:

- (1) *Vendor Initial Validation Testing*. Testing shall be completed by the applicant following the required specifications and specific test conditions described below prior to submitting their application package. Vendor initial validation testing results shall be included as part the application package submission.

- (A) Applicant shall test their device using, at a minimum, the specified test conditions below for basic monitoring.
1. Test at least one vehicle from every OBD protocol group applicable to the device and provide three consecutive ROBD test records from each vehicle. Noting the ignition ON time, verify that the test time is within five minutes of the ignition ON time.
 2. Test at least one vehicle from every OBD protocol group applicable to the device and provide three consecutive ROBD test records from each vehicle where the MIL is commanded OFF, there are no diagnostic trouble codes, all vehicle supported readiness monitors are in a ready state, and the resulting ROBD test records reported the expected data.
 3. Test at least one vehicle from every OBD protocol group applicable to the device and provide three consecutive ROBD test records from each vehicle where the MIL is commanded ON, there is at least one stored diagnostic trouble code AND at least one pending diagnostic trouble code, and the resulting ROBD test records reported the expected data.
 4. Test at least one vehicle from every OBD protocol group applicable to the device and provide three consecutive ROBD test records from each vehicle where the MIL is commanded OFF, there are no diagnostic trouble codes, at least one monitor is not ready, and the resulting ROBD test records reported the expected data.
 5. Test at least three different vehicles and provide three consecutive ROBD test records from each vehicle showing that the electronic VIN is received from the vehicle, and is not a user inputted VIN from any device registration process. The device shall always accurately report the electronic VIN when the device is installed from one vehicle to another.
 6. Produce at least three consecutive ROBD test records each from hybrid vehicles with all the required data as specified in the OBD specifications document.
 7. Produce at least three consecutive ROBD test records each from any alternate fuel vehicles of any OBD

protocol with all the required data as specified in the OBD specifications document.

(B) If the applicant is certifying a CC-ROBD device, the following test conditions shall be completed in addition to the basic monitoring test conditions specified in section (IX)(c)(1)(A).

1. Test a vehicle and submit a test record in which a loss of power is detected between the vehicle and the CC-ROBD tool.
2. Test a vehicle and submit a test record in which the MIL light changes from off to on, and vice versa.
3. Test a vehicle and submit a test record in which the device notices a change in the electronic identifiers (i.e. E-VIN, ECU ID, etc.).
4. Test a vehicle and submit a test record from a vehicle in which the OBD monitor readiness changes from “ready” to “not ready”.
5. Submit a test record for when the device detects that the vehicle has entered into California (optional for GPS-based parameter).
6. Submit the applicable test record for when the device detects that the vehicle has left California.

(C) Applicant shall submit, at a minimum, the following additional information in an organized format with each initial validation testing result required as part of sections (IX)(c)(1)(A) and (IX)(c)(1)(B):

1. OBD data test vehicle: Year, Make, Model, VIN# (or OBD simulator)
2. Test date and time
3. Ignition ON time and ignition OFF time (in UTC time format) of the test event which produced the ROBD record.
4. Engine and engine family
5. The record ID of the test
6. The raw OBD data file (i.e., data portion of the CAN Bus messages in Hexadecimal format)
7. Comparison of the raw OBD file to a baseline data file for the specific vehicle
8. CARB may ask for more information if deemed necessary to validate the testing accuracy of the device.

- (2) *CARB Device Verification Testing.* The Executive Officer shall perform device verification testing in a laboratory setting to ensure the device meets all specifications, to verify if the device successfully communicates with and collects the requested data, and to validate the device’s ability to meet the required testing specifications.
- (A) Applicant shall submit physical devices to the Executive Officer for verification and certification.
 - (B) The devices provided shall be in a configuration that is suitable for testing. It shall have all the necessary equipment, instruments, and set up information that was originally used for testing.
 - (C) The device shall be functional in standard working and vehicle environments and thus be resistant to shock, vibration, and environmental exposure in order to ensure reliability and accuracy.
 - (D) The Executive Officer shall issue results to the applicant. If the device passes all testing from CARB’s verification testing, the device shall be allowed to move onto the certification requirements specified in the next section below.
 - (E) If the device does not pass CARB’s verification testing, the device shall be returned to the applicant and the applicant shall make the necessary modifications. After addressing the device deficiencies, the applicant may resubmit a new certification package to the Executive Officer.
- (3) *Vendor Field Testing.* Testing shall be completed by the applicant using devices in the exact same configuration as those that completed the CARB device verification testing.
- (A) Applicant shall perform real-world testing by collecting data from an applicable heavy-duty vehicle population, as shown in the following table, within 180 days from the start of field testing.

Table 4: NCC-ROBD Test Bins for Vendor Field Testing

Engine Type	Number of Vehicles	J1939 Protocol¹	J1979 Protocol²	J1979-2 Protocol²
Diesel	940	800	90	50
Alt fuel	40	20	10	10

Hybrid	20	10	5	5
Total Number of Vehicles	1,000	830	105	65

¹ Test vehicles with must be from at least five different engine manufactures.

² Test vehicles must be from at least three different manufacturers.

Table 5: CC-ROBD Test Bins for Vendor Field Testing

Vehicle Type	Number of Vehicles	J1939 Protocol ¹	J1979 Protocol ²	J1979-2 Protocol ²
Diesel	470	400	45	25
Alt fuel	20	10	5	5
Hybrid	10	6	2	2
Total Number of Vehicles	500	416	52	32

¹ Test vehicles must be from at least three different engine manufacturers.

² Test vehicles must be from at least two different manufacturers for each protocol.

(B) Applicant shall electronically submit required testing data to the Executive Officer.

(C) Applicant shall ensure successful communication between the device and the vehicle.

(D) Applicant shall obtain a successful connectivity rate of 99.9% for priority data listed in the following table.

Table 6: Priority Data for Vehicle Field Testing

Description	J1939 Protocol	J1979 Protocol
Available parameters (SPNs or PIDs)	DM24	Mode \$01 PID \$00 Mode \$09 InfoType \$00
MIL Status	DM1, DM5, DM21, DM26	Mode \$01 PID \$01
OBD Compliance	DM5	Mode \$01 PID \$1C
DTCs	DM1, DM5, DM12	Mode \$03

VIN	PGN: 65260/ SPN: 237	Mode \$09 InfoType \$02
Permanent DTCs	DM28	Mode \$0A
CAL ID/CVN	DM19	Mode \$09 InfoType \$04 Mode \$09 InfoType \$06
Diagnostic readiness	DM5, DM21, DM26	Mode \$01 PID \$01

- (E) Applicant shall obtain a successful connectivity rate of 90.0% for all other required data parameters.
- (F) The Executive Officer may adjust the two connectivity rates independently in 0.10% increments to ensure uniform and consistent tests.
- (G) Applicant shall ensure that the device is continuously in compliance with the certified configuration.
- (H) If the applicant would like to exempt a vehicle(s), a request shall be made to CARB requiring the approval of the Executive Officer before submitting the test results. The request shall contain the technical reasons and supporting data that explains why the vehicle should be exempted from the calculation.
- (I) If applicant shall not complete the field testing at the end of 180 days, applicant shall contact CARB by the 150th day and provide the reason(s) why it may not be completed on time.
 - 1. The Executive Officer will evaluate whether the applicant shall be allowed to continue with the testing or shall be required to resubmit a new application and restart the certification process.
 - a. The criteria used to make this determination shall include:
 - Applicant(s) reasoning as to why the field testing is not able to be completed on time.
 - Whether unavoidable and unexpected issues occurred during the allotted testing period that made meeting the required deadline infeasible
 - Whether the current testing completed to this point is consistent with the

requirements that devices must meet to obtain certification

- The Executive Officer may ask for additional test data or engineering evaluations to make this determination.

(J) If the device fails to meet the requirements during field testing, the applicant shall determine the reason(s) for device failure.

1. The Executive Officer shall evaluate whether applicant shall be allowed to retest their device in this phase after addressing the deficiencies or shall be required to resubmit a new application and restart the certification process.

a. The criteria to be used to make this determination shall include:

- Applicant(s) provided technical reason(s) with supporting information explaining the reasons for their device failure and modifications needed to fix the issue.
- Whether unavoidable and unexpected issues occurred during the allotted testing period that made meeting the required deadline infeasible
- Whether the technical issues as to why the device failed needs further laboratory testing to confirm the problem.
- Whether the recommended solution to the identified issue needs further laboratory testing to confirm that the issue was remedied.
- The extent to which the current testing device is from being in a certifiable configuration
- The Executive Officer may ask for additional test data to make this determination

2. If the device fails a second attempt of field testing, the applicant shall be determined to have failed the certification process. The applicant may resubmit a

new certification application after addressing any deficiencies.

(d) Labeling requirements

- (1) Vendor shall permanently affix, engrave, or stamp the unique identification number on each certified device in a legible way as specified in section (IX)(b)(2)
 - (A) Include this statement, "THIS CARB CERTIFIED DEVICE IS DESIGNED TO COMPLY WITH CARB HD I/M PROGRAM."
- (2) The label shall meet the requirements of 40 CFR 1068.45.
- (3) The applicant may make a request of the Executive Officer to approve a modified label as necessary.

(e) Warranty requirements

- (1) Vendor shall warrant the ultimate device purchaser and each subsequent purchaser that the device is designed and built free of defects in materials and workmanship for a period of one (1) year from the date of delivery.
- (2) Vendor may deny warranty claims under this section if the operator caused the problem through improper maintenance or use.
- (3) Vendor shall provide an Owner's manual to the ultimate purchaser that includes, but not limited to, the following information:
 - (A) Vendor shall describe the device and applicability, and provide instructions on the initial setup, troubleshooting, and proper maintenance.
 - (B) Vendor shall provide a process to update the software of in-use devices used as part of this section, including providing a description of online user interface if it is required to be used to send data to CARB.
 - (C) Vendor shall provide a response to purchaser inquiries and technical support to purchasers of the device through a toll-free number within 24 hours of receipt of call.
 - (D) Other information useful to the purchaser may be included in the manual.

(f) Post-certification requirements

- (1) Once the device meets the certification testing requirements, the applicant shall receive an Executive Order and the device may be sold and used for compliance purposes with this chapter. An Executive Order is valid from the indicated effective date until the end of the calendar year

for which it is issued. Certification is to be renewed annually for any device for continued use in the program.

- (2) Only OBD data submitted from certified devices shall be used to demonstrate vehicle compliance.
- (3) The Executive Order holder shall be required to report a list of certified devices active in the field and ensure certified devices are reported within one week of device activation.
- (4) The Executive Order holder shall update the hardware and/or firmware and/or software to conform with the specifications required of devices.
 - (A) The updates shall be provided to CARB and to the user at no cost.
 - (B) The updates shall be implemented on all certified devices within two weeks of approval from CARB.
 - (C) The normal scheduled updates shall be provided to CARB and user on a quarterly basis, at a minimum. The Executive Officer may waive the normal schedule update.
 - (D) If a problem is detected with the device that critically impacts the compliance with the certified configuration, the Executive Order holder shall provide an emergency update, on a schedule mandated by CARB.
- (5) Applicant shall provide a copy of a Disclosure Agreement provided by CARB to the ultimate purchaser of the new device and/or existing user of the in-use device to inform that the device has been certified for use in the HD I/M program for a period of up to one year until the end of the calendar year, that it must be recertified at the end of one year, and may be decertified any time.
 - (A) The applicant shall obtain the signature of the ultimate purchaser of the new device and/or existing user of the in-use device acknowledging the provisions of the Disclosure agreement.

(g) Recordkeeping requirements

- (1) Organize and maintain the following records:
 - (A) A copy of all applications and any provided information to CARB.
 - (B) Keep a list of device unique identification numbers for all devices produced and sold under each Executive Order and identify the vehicle it is paired to, if applicable.
- (2) Keep required test data and all other information specified in this section for five years after CARB issues the Executive Order.
- (3) Records shall be readily available and stored in the same format as the submitted certification application and on any media, as long as the

applicant can promptly send organized, written records in English to the Executive Officer if requested within 30 days.

(h) Reporting Requirements

(1) The Executive Order holder shall be required to electronically report a list of certified devices active in the field to the reporting system designated by the Executive Officer within one week of device activation.

(A) The report shall list the unique identification numbers for all devices produced and sold under each Executive Order and identify the vehicle it is paired to, if applicable. Additional information such as the ultimate purchaser's name, address, and phone number may also be required.

(i) Recertifying annually

(1) Ninety (90) days prior to the conclusion of the certification period, the Executive Officer shall evaluate whether the device continues to meet the required specifications. The Executive Order holder shall submit a recertification application for a new Executive Order.

(A) If the Executive Officer determines that the device still meets the required specifications, the device shall be recertified for another one (1) year period.

(B) Devices determined not to continually fulfil the required specifications shall not be recertified and shall be removed from use for compliance determination for this section.

1. After addressing the device deficiencies, the device vendor may resubmit a new certification application package to the Executive Officer for approval.

(j) Decertifying devices

(1) If CARB finds that a certified device vendor fails to furnish or install required software updates to the device or continually meet the specifications and requirements as stated in this section, the Executive Officer shall decertify the device in writing or by electronic mail with a specified effective date of the decertification. After the device is decertified, the device is considered noncompliant and shall no longer be used in the program for compliance determination purposes.

(2) If a vendor does not perform to the required standards of the program or fails to recertify their devices when required, the Executive Officer shall remove the vendor and their devices from participation in testing for this chapter after a notice in writing or by electronic mail is given.

(3) Any failure to comply with the final order for payment of a fine, or to pay the amount specified in any settlement agreement, is cause for decertification of the vendor's device(s).

(k) Other provisions

- (1) An agent or employee of the CARB has the right of entry to any facility where OBD test devices subject to the requirements of this section are located and/or OBD test device records subject to the requirements of this section are located for the purpose of inspections of the OBD test devices themselves and/or their records to verify compliance with these requirements.
- (2) Any person who fails to comply with these requirements or fails to submit information, reports, or statements required by this section shall be subject to citation and/or decertification.
- (3) Any person who knowingly submits any false statement or representation in any application, report, statement, or other document filed, maintained, or used for the purposes of compliance with this regulation shall be subject to citation and/or decertification.

X. Enforcement

(a) Violations.

(1) Notice to Correct.

The following violations of the requirements outlined in this chapter shall result in the issuance of a Notice to Correct. Vehicle owners that receive a Notice to Correct will be provided 45 days, or 75 days for owners of agricultural vehicles, to submit the applicable proof of correction as outlined in section (X)(c). Owners of vehicles opting into the GPS submission option specified in section (VIII)(c)(4)(C)(5) shall submit a passing test data within 45 days of receipt of Notice to Correct (within 75 days of receipt for agricultural vehicles) or one day of reentering California, whichever is later. Failure to provide the applicable proof of correction by the provided due date may result in a citation and penalties.

- (A) Vehicle detected operating on a California roadway without a valid compliance certificate, first offense.
- (B) Submittal of inaccurate data to electronic reporting system approved by the Executive Officer as outlined in section (III).
- (C) Vehicle operating while MIL illuminated and/or failure to meet the OBD inspection passing criteria specified in section (VIII)(c)(1)(C).
- (D) Missing, obscured, or illegible emission control label specified in section (III)(h)(A).
- (E) Failure to meet OBD or opacity data submission requirements specified in (VIII)(c)(5) and (III)(c)(2)(F),

respectively.

- (F) Failure to meet passing criteria for OBD or opacity testing specified in (III)(c)(1)(C) or (III)(c)(2)(F), respectively following a successful submission.

(2) Citations.

The following violations of the requirements outlined in this regulation may result in the direct issuance of citation and penalties. The registered owner, vehicle operator, freight contractor, or other entity that receives a citation will be provided 45 days, or 75 days for owners of agricultural vehicles, to submit the applicable proof of correction as outlined in section (X)(c) and applicable penalties. Evidence of fault on the part of the registered owner, vehicle operator, freight contractor, or other entity shall not be considered a mitigating circumstance for assessing the penalty. Violations can include, but are not limited to the following:

- (A) Failure to submit passing OBD or opacity data by a given periodic testing deadline as specified in (III)(3).
- (B) Refusals. The refusal by an owner or driver of a vehicle to do the following items would constitute as a failure of the applicable test procedures conducted during an inspection, unless the driver is cited by the California Highway Patrol for a violation of California Vehicle Code section 2813, and shall result in applicable penalties.
 - 1. Refusal to submit to an inspection or any applicable tests during an in-person field inspection will be considered a failure of the applicable tests as outlined in section (VII).
 - 2. Refusal to submit to a referee inspection as outlined in section (III)(h).
- (C) Excessive smoke outlined in section (III)(c)(2)(E).
- (D) Tampering of the emission control components as outlined in section (III)(h)(B), except for a missing, illegible, or obscured emission control label.
- (E) Submittal of fraudulent data to the electronic reporting system approved by the Executive Officer outlined in section (III)(3).
- (F) Failure to provide the applicable proof of correction requested from a Notice to Correct by the provided due date section (X)(a)(1).
- (G) Hiring and/or dispatching a non-compliant vehicle in the State of California outlined in section (VI).
- (H) Any actions that CARB deems to be in violation of the program requirements specified in section (IX).

- (I) Operating on a California roadway without a valid compliance certificate, second offense and beyond, as outlined in section (III)(f)

(3) Revocation of Compliance Certificate.

If a vehicle owner fails to resolve a citation by the due date outlined in the notice, CARB will revoke the compliance certificate, preventing registration with the Department of Motor Vehicles until the outstanding citation is resolved.

(4) Additional Enforcement.

The California Air Resources Board may also take further enforcement actions outlined in section (X)(e) in the event that citations issued in the result of a violation are not addressed by the provided due date.

(b) Penalties.

- (1) Any person who fails to comply with the general requirements of this chapter, who fails to submit any information, report, or statement required by this chapter, or who knowingly submits any false statement or representation in any application, report, statement, or other document filed, maintained, or used for the purposes of compliance with this chapter may be subject to penalties.
- (2) When a heavy-duty vehicle is cited after a bona fide change of ownership between non-related persons or entities, the new owner shall not be subject to the penalties if the only Citations issued for the vehicle within the previous 12 months were issued prior to the change of ownership to the new owner.

(c) Demonstration of Correction and Post-Repair Test or Inspection.

- (1) Demonstration of Correction. In the event of a Notice to Correct or Citation, the owner must demonstrate correction by submitting documentation to the California Air Resources Board. The required documentation may include, but is not limited to, one or more of the following items:
 - (A) Complete a successful OBD test via a testing method specified in section (III)(c)(1)
 - (B) Complete a successful SAE J1667 smoke test and visual inspection as specified in section (III)(c)(2)
 - (C) Where repairs are made at a repair facility, a repair invoice or a completed work order which contains the following information:

1. Name, address, and phone number of the facility.
 2. Name of mechanic.
 3. Date of the repair.
 4. Description of component replacement(s), repair(s), and/or adjustment(s).
 5. Itemized list of replaced component(s), including description of part, part number, and cost.
 6. Vehicle information including engine serial number, vehicle identification number, and/or license plate.
- (D) Where the owner makes his or her own repairs outside of a repair facility.
1. An itemized receipt for the parts used in the repair.
 2. A statement identifying the date, nature of the repairs made and vehicle information including engine serial number, vehicle identification number, and license plate.
- (E) Proof of HD I/M reporting and compliance certificate
- (2) Statement of Correction. Statement attesting that submission of data is true and correct.
- (3) The California Air Resources Board may require a CARB post-repair test or a CARB post-repair inspection by the referee whenever:
- (A) A submitted repair invoice or work order does not comply with (1) above.
 - (B) A repair invoice, work order or authorized dealer verification appears to be fraudulent.
 - (C) A second and subsequent failures of the test procedure or an emission control system inspection on the vehicle occur prior to the next required reporting date.
- (d) Vehicles Removed from Service.
- (1) Vehicles found to be in violation of this chapter are subject to removal from service by the Department of the California Highway Patrol pursuant to California Vehicle Code section 27159 if requested by the California Air Resources Board inspector, and if one or more unresolved Citations issued under section (X)(a)(2) exist at the time of inspection.
 - (2) Upon payment of all unpaid penalties for a vehicle that has been removed from service, the California Air Resources Board shall provide the owner, or designee, a release form for presentation to the Department of the California Highway Patrol.
 - (3) The release of the vehicle shall be subject to the condition that it be repaired and post- repair tested or inspected within 15 days.
- (e) Additional Enforcement.

The owner of a vehicle cited under these regulations may request a hearing as outlined by CARB's administrative hearing regulations.

(1) The California Air Resources Board may also take the following enforcement actions in the event that citations issued in the result of a violation are not addressed within the allotted timeframe.

(A) Judgments. After an order imposing an administrative penalty becomes final pursuant to the hearing procedures identified in this section and no petition for a writ of mandate has been filed within the time allotted for seeking judicial review of the order, the California Air Resources Board may apply to the Superior Court for the County of Sacramento for a judgment in the amount of the administrative penalty. The application, which shall include a certified copy of the final order of the administrative hearing officer, shall constitute a sufficient showing to warrant the issuance of the judgment. (HSC 44152(j))

(B) Liens on Property and Vehicles.

XI. Severability of Provisions

If any subsection, paragraph, subparagraph, sentence, clause, phrase, or portion of this Chapter is, for any reason, held invalid, unconstitutional, or unenforceable by any court of competent jurisdiction, such portion shall be deemed as a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions of the regulation.

XII. HDVIP/PSIP Regulation Amendments

On January 1, 2024, the requirements established by title 13 Division 3 Chapter 3.5 Sections 2180 – 2194 will be superseded by the requirements outlined in HD I/M Regulation XXXXX. Any enforcement actions resulting from a violation of the aforementioned sections prior to January 1, 2024, shall remain valid. If any portion of the HD I/M XXXXX that supersedes these requirements is held invalid, unconstitutional, or unenforceable by any court of competent jurisdiction, those requirements of title 13 Division 3 Chapter 3.5 Sections 2180 – 2194 will be reinstated.