

State of California
CALIFORNIA AIR RESOURCES BOARD

MANUFACTURERS ADVISORY CORRESPONDENCE (MAC) 2020-02

SUBJECT: Certification Guidance for California Phase 2 Greenhouse Gas (GHG) Regulations for Medium- and Heavy-Duty Engines, Vehicles and Trailers

APPLICABILITY:

- 2021 and Subsequent Model Year Heavy-Duty Diesel Engines
- 2021 and Subsequent Model Year Heavy-Duty Otto-Cycle Engines
- 2021 and Subsequent Model Year Heavy-Duty Diesel and Otto-Cycle Engines used in Medium-Duty Vehicles (GVWR 10,001-14,000 lbs)
- 2021 and Subsequent Model Year Medium-Duty Vehicles (GVWR 10,001-14,000 lbs) except Medium-Duty Passenger Vehicles
- 2021 and Subsequent Model Year Heavy-Duty Vehicles
- 2020 and Subsequent Model Year Trailers

REFERENCES:

1. Title 13, California Code of Regulations (CCR), Section 1956.8.
2. Title 13, California Code of Regulations (CCR), Section 1965.
3. Title 13, California Code of Regulations (CCR), Section 2035.
4. Title 13, California Code of Regulations (CCR), Section 2039.
5. Title 13, California Code of Regulations (CCR), Section 2112.
6. Title 17, California Code of Regulations (CCR), Section 95662.
7. Title 17, California Code of Regulations (CCR), Section 95663.
8. California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles, adopted December 12, 2002, as last amended December 19, 2018 (HDDE Test Procedures).
9. California Exhaust Emission Standards and Test Procedures for Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles, adopted December 27, 2000, as last amended December 19, 2018 (HDOE Test Procedures)
10. California Greenhouse Gas Exhaust Emission Standards and Test Procedures for 2014 and Subsequent Model Heavy-Duty Vehicles, adopted October 21, 2014, last amended December 19, 2018 (HDV Test Procedures).

BACKGROUND

In 2011, the U.S. Environmental Protection Agency (US EPA) and the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) jointly promulgated the federal Phase 1 regulations for new heavy-duty engines and vehicles¹ to reduce GHG emissions from on-road vehicles. On December 12, 2013, the California Air Resources Board

¹ CARB's regulations cover the medium-duty and heavy-duty engines and vehicles categories, which are similar to US EPA's heavy-duty engines and vehicles.

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(CARB) adopted the California Phase 1 regulations that are analogous to the federal Phase 1 regulations for 2014 and subsequent model year new medium- and heavy-duty engines and vehicles. In 2016, the US EPA and NHTSA finalized the federal Phase 2 regulations, with more stringent GHG standards for new heavy-duty engines and vehicles. In addition, the federal Phase 2 regulations established for the first time, emissions requirements for trailers hauled by heavy-duty tractors.

On February 8, 2018 CARB conducted a public hearing to consider the approval of the California Phase 2 Greenhouse Gas (GHG) regulation. At the conclusion of the hearing, the CA Phase 2 regulation was approved for adoption. Subsequently, the Office of Administrative Law (OAL) approved the California Phase 2 regulation on February 7, 2019, and the California Phase 2 GHG regulation became effective under state law on April 1, 2019.

The California Phase 2 GHG regulation establishes GHG standards that are largely harmonized with the corresponding federal Phase 2 standards but also incorporates minor differences that are needed to facilitate CARB's enforcement of the regulation, align with other existing California programs, and to provide incentives for manufacturers to bring advanced technologies to the market. A key difference between the federal and California Phase 2 regulation is the additional air conditioning system information that must be provided to demonstrate compliance with the A/C leakage standard. The additional documents are: 1) a cover letter and summary table with information about the vehicle family, AC system, refrigerant type, refrigerant capacity, refrigerant leak rate and percent leak rate of the AC system; 2) AC system schematics to show the topological layout of the system components; and 3) SAE J2727 spreadsheets to show the system component specifications and system leak rate calculation.

Unlike the California Phase 1 regulations, federally certified engines and vehicles are not "deemed to comply" with the California Phase 2 regulation. Manufacturers must instead submit certification information and data directly to CARB in order to demonstrate their engines and vehicles comply with the California Phase 2 standards. CARB will independently determine whether affected engines and vehicles comply with the California Phase 2 requirements prior to issuing an executive order (EO). CARB will implement the certification requirements applicable to model year 2020 and 2021 model year trailers on a voluntary basis.

Appendix A lists the major differences between the California Phase 1 and Phase 2 Regulation.

Definitions of terms used in this MAC are set forth in Section 1036.801 of HHDE Test Procedures, section 1036.801 of HDOE Test Procedures, section 1037.801 of HDV Test Procedures, and 13 CCR section 2112 and 17 CCR section 95662. The specified sections from federal CFR noted in this document refer to those as adopted by the Board in the HDDE Test Procedures, HDOE Test Procedures and HDV Test Procedures.

POLICY:

Pre-Certification Activities

1. Registration with CARB to submit certification applications, data and documents, and other requirements

To certify with CARB, manufacturers must register before submitting their applications for certification.

- a. Heavy-duty engine, vocational vehicle, and tractor manufacturers must follow the instructions on the CARB website at <https://ww2.arb.ca.gov/resources/documents/road-heavy-duty-certification-program-instructions-new-manufacturers>
- b. Trailer manufacturers must follow the registration instructions on the CARB trailer certification website at <https://ww2.arb.ca.gov/our-work/programs/greenhouse-gas-standards-medium-and-heavy-duty-engines-and-vehicles/phase-2-ghg>
- c. CARB is presently developing an E-Cert system to supplement the Document Management System (DMS) to receive most data submittals (for engine and vehicle certification submissions) and replace the email submittal process for trailer certification. CARB will notify manufacturers when the ECERT System is established and able to accept certification documents.

2. Label sample evaluation

After registering with CARB, manufacturers certifying for the first time or when materials/suppliers have changed must contact their assigned certification staff. Manufacturers must send actual label samples to be evaluated. Evaluation will be performed to ensure labels will comply with requirements specified in 40 CFR 1068.45. On an annual basis, manufacturers must submit designs of labels or previous approvals with new certification applications.

3. Certification preview meetings

CARB staff strongly encourages manufacturers to schedule certification preview meetings prior to submitting application documents. This offers both manufacturers and CARB staff an opportunity to discuss the Phase 2 GHG standards and requirements, testing plans, product offerings, and other certification-related matters. This meeting is typically held once a year. Manufacturer representatives must contact their CARB certification staff directly to arrange such meetings.

4. AECD/Test plans

Auxiliary emission control device (AECD) document and test plan reviews are time

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intensive. Manufacturers are encouraged to consult with CARB staff several months before an executive order is requested.

5. Anti-tampering method

Manufacturers must submit a report that describes the anti-tampering methods for any emission-related adjustable parameter of the engine, vehicle, or trailer.

Certification documents to be submitted for review

1. Engine Certification

This section applies to 2021 and subsequent model year diesel and Otto-cycle engines intended for use in vehicles with a GVWR \geq 10,001 pounds. A Phase 2 GHG engine EO will cover criteria emissions and GHG. For Phase 2 GHG certification, engine manufacturers must furnish CARB with information related to the following:

a. Application

In the application for certification, manufacturers must include CO₂, CH₄ and N₂O exhaust emissions data. In addition to the emissions data, the manufacturer shall also provide: engine family name, model year, useful life, average, banking, and trading (ABT) declaration, Family Emission Limit (FEL) if applicable, Family Certification Level (FCL) if applicable, primary intended service class, deterioration factor (DF), infrequent regeneration adjustment factor (IRAFs), engine restriction (vocational vehicle only, tractor only, or both tractor and vocational), test engine information, test results, engine fuel or map powertrain information, estimated production numbers, and all other information requested in the application.

b. Statement of Compliance

- Manufacturers of diesel cycle engines must submit a statement of compliance, including a statement that they are unconditionally certifying that all the engines in the engine family are built as described and comply with the requirements (Section 1036.205.2 of the HDDE Test Procedures).
- Manufacturers of Otto-cycle engines must submit a statement of compliance, including a statement that they are unconditionally certifying that all the engines in the engine family are built as described and comply with the requirements (Section 1036.205.2 of the HDOE Test Procedures).

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c. Engine Maps report

Perform engine mapping for your engine as described in 40 CFR 1036.510 (b) and report the information required in 40 CFR 1036.510 (d).

d. GHG Emission Test Data

Present CO₂, CH₄, and N₂O emissions data. Federal Test Procedure (FTP) data must include the individual emissions measurements for cold-start testing and hot-start testing over the transient test cycle and the resulting composite values. Also, show emission figures before and after applying deterioration factors. For the Ramped-Model Cycle (RMC) data, show the CO₂ emissions data before and after the deterioration factor is applied.

e. Deterioration Factor (DF) Report

Manufacturers must submit for CARB review a report that describes how the engine family's deterioration factors were developed. Alternatively, manufacturers may use assigned DFs instead of developing their own DFs for their engine families (40 CFR 1036.150 (g)).

f. Installation Instructions Report

The provisions of 1036.130 of the test procedures apply to manufacturers that sell their engines to a third party for installation into a vehicle. Manufacturers must submit an installation instructions report for CARB review. The report must detail the instructions to the installer to ensure the engine is installed in its certified configuration.

g. Engine Label Picture

Manufacturers must submit for CARB review an engine label picture. In addition to the label requirements of section 35 of the HDDE and HDOE Test procedures, the label shall include the requirements listed in 40 CFR 1036.135 of the test procedures.

h. Warranty Statement

Manufacturers must submit for CARB review a copy of its emission warranty statement in addition to each engine family's certification application. The requirements are specified in 13 CCR section 2035 et seq.

i. Technical Description and AECDs.

Describe the engine family specifications and all fuel-system components that are

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installed on production and test engines. Include a list of all emission control systems (with part numbers) used to control GHG emissions, and describe their emission control strategies. Also, include descriptions of the AECDs as specified in 40 CFR 1036.205 (a).

j. ABT Plans

Manufacturers must indicate in the ABT plan their intention to participate in the ABT program and declare Family Emission Limits (FELs) and Family Certification Levels (FCLs) for each engine family. The plan must include all the requirements specified in 1036.725 of the HDDE Test Procedures and HDOE Test Procedures, as applicable.

k. IRAFs report

As specified in section 1036.530(a) of the HDDE Test Procedures, manufacturers shall apply IRAFs to CO₂ emission levels for engines that undergo infrequent regeneration events. Manufacturers must submit a report that details the IRAFs calculations for such engine families.

2. Vocational Vehicle and Tractor Certification

To certify vocational vehicles (GVWR > 10,000) and tractors (GVWR > 26,000) fueled by conventional and alternative fuels, manufacturers must submit the applicable information and reports listed below.

a. Application

In the application for certification, manufacturers must present CO₂ emissions data. For each vehicle family, manufacturers must complete the California Phase 2 Greenhouse Gas Heavy-Duty Vehicle Application Template by completing the following worksheets:

- General Family Information
- GEM¹ input parameters
- AECD summary worksheet
- Technology worksheet
- HFC² (AC leakage) worksheet
- GEM input worksheet
- GEM output worksheet

¹GEM=Greenhouse gas emission model

² HFC = Hydrofluorocarbon

b. Engine map

Vehicle manufacturers must submit the engine map(s) of the donor engine(s). The following additional information must be provided for each engine map:

- Engine manufacturer name
- File name(s)

c. Statement of Compliance

Manufacturers must submit a statement of compliance (Section 1037.205.A.2 of HDV Test Procedures), including a statement that they are unconditionally certifying that all the vehicles in the vehicle family are built as described and comply with the requirements.

d. Regulatory subcategory of vehicle family

Specify the vehicle family's regulatory subcategory (40 CFR 1037.230). Vocational vehicle manufacturers must include the justification for the duty cycle chosen for the vehicle family.

Proposed test plans

- Aerodynamic evaluation test to determine the aerodynamic drag area, C_dA of vehicles

This is optional for vocational vehicles (40 CFR 1037.527). For tractors, manufacturers must provide a test plan to determine the drag area (C_dA) using the coastdown test procedure (detailed in 40 CFR 1037.525 and 40 CFR 1037.528) or using a CARB approved alternative procedure.

- Tire revolutions per mile (TRPM) and tire rolling resistance level (TRRL)

Manufacturers must determine and report the Tire Rolling Resistance Level (TRRL) and Tire Revolutions per Mile (TRPM) of the tires as described in 40 CFR 1037.520(c). Alternatively, the test results may be obtained from the tire manufacturer or a third party with a signed statement from the party testifying that the tests were conducted according to the requirements in 40 CFR 1037.520(c). 40 CFR 1037.520(c)(4).

e. Test Results

Submit results from the aerodynamic evaluation test, TRRL test and all other tests performed.

f. GEM Input and Output files reports

Determine GEM inputs using the procedures specified in Table A and B as applicable. Report the GEM input data (with details on how they were determined). Also, report the GEM output data as specified in 1037.205(o) of HDV Test Procedures. Include the emission standards or FELs to which you are certifying vehicles in the vehicle family. For families with multiple subfamilies, identify the highest and lowest FELs to which any of your subfamilies will be certified (40 CFR 1037.205(k)).

Table A: User-Defined GEM Modeling Parameters for Vocational Vehicles and Tractors

Modeling Parameter	Method for determining parameter
Engine data file	40 CFR 1036.510, 1036.535, and 1036.540
Transmission file	40 CFR 1037.520(g)(1) and optionally 1037.565
Powertrain data file (Optional)	40 CFR 1037.550
Drive Axle Configuration	40 CFR 1037.520(g)(2)
Drive Axle Ratio	40 CFR 1037.520(g)(3)
Drive Axle data file (Optional)	40 CFR 1037.560
Aerodynamic Drag Area, delta C _d A (m ²)	40 CFR 1037.520(b) for tractors
Steer Axle Tire Rolling Resistance (kg/ton)	
Drive Axle 1 Tire Rolling Resistance (kg/t)	
Drive Axle 2 Tire Rolling Resistance (kg/t)	40 CFR 1037.520(c)
Drive Axle Loaded Tire Size (rev/mi)	40 CFR 1037.520(c)

Table B: Technology Improvement Options for Vocational Vehicles and Tractors

Technology Improvement	Reference
Vehicle Speed Limiter (m/h)	40 CFR 1037.520(d)
Hybrid Power Take Off Fuel (g/ton-mile)	40 CFR 1037.520(k) and 1037.540
Weight Reduction (lb)	40 CFR 1037.520(e)
Start-Stop (Y/N)	40 CFR 1037.520(h)
Automatic Engine Shutdown for vocational vehicles	40 CFR 1037.520(h)
Neutral Idle, for automatic transmissions only (Y/N)	40 CFR 1037.520(h)

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Intelligent Controls	40 CFR 1037.520(j)(1)
Accessory Load (%)	40 CFR 1037.520(j)(2)
Extended Idle Reduction, Sleeper Cabs only (%)	40 CFR 1037.520(j)(4)
Tire Pressure System (%)	40 CFR 1037.520(j)(3)
Other (%)	40 CFR 1037.520(j)(5)

g. Innovative Technology Report

40 CFR 1037.610 describes the procedures for determining CO₂-emissions reductions from innovative technologies, which are not reflected in the GEM. Manufacturers that intend to utilize this procedure must submit a report that details the CO₂ emissions reduction calculations and receive advanced approval from CARB prior to using this provision.

h. Advanced-Technology Vehicles Credit Report

40 CFR 1037.615 details the protocol for calculating CO₂ emissions credits for advanced technology vehicles. This provision applies to electric vehicles, plug-in hybrid vehicles and fuel cell vehicles. Manufacturers generating Advanced Technology Credits (ATC) must submit a report that details the CO₂ credit calculations of their vehicles.

i. Adjustable Operating Parameter Report

Describe all adjustable operating parameters and their production operating ranges as specified in 40 CFR 1037.115 and 40 CFR 1037.205 (p). The description of each parameter must include:

- The nominal or recommended setting
- The intended physically adjustable range of the parameter
- The limits or stops used to establish the adjustable range, and
- Information on how limits or stops are effective in preventing adjustments to settings outside intended physically adjusted ranges on in-use vehicles.

j. Technical Description and AECDS report

Describe the vehicle family specifications and all fuel-system components that will be installed on production vehicles. Include a list of all emission control systems used to control GHG emissions and describe their emission control strategies. Also, include the description of AECDS as specified in 40 CFR 1037.205 (b). Describe the modeling inputs (40 CFR 1037.520), with the additional information specified in 40 CFR 1037.205(b)(1) to (9), as applicable.

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The following information must be included in the technical description of electric vehicles:

- Intended Vehicle Weight Class
- Description and specifications of the heating, ventilation and air conditioning (HVAC) system installed on the vehicle
- Materials and physical dimensions of batteries, storage tanks etc.
- Capacity of batteries, storage tanks, etc. installed on the vehicle
- Recharging/fast-recharging strategy or description
- Testing protocols used
- Intended climatic operating conditions (e.g. temperature)
- Expected longevity of components on the vehicle

k. ABT Plans

Manufacturers must indicate in the Federal ABT plans their intention to participate in the ABT program. Manufacturers must also declare CO₂ FELs for each vehicle family or subfamily in the Federal ABT plan. The proposal must include all the requirements specified in 1037.725 of the HDV Test Procedures.

l. California ABT Plan

Manufacturers must also submit the California ABT plan (see Appendix B) as part of the certification documents if any of the following applies to the vehicle family:

- The vehicle family uses Low GWP refrigerant to receive extra credit as specified in section 1037.115.B.2 of the HDV Test Procedures
- The vehicle family is an Urban bus being certified to the Other Bus standard in 40 CFR 1037.105(h) and meeting the requirements specified in section 1037.241 and 1037.701 of the HDV Test Procedures
- The vehicle family is a plug-in hybrid vehicle meeting the additional requirements specified in section 1037.150.3(2)(i) and (ii) to receive hybrid advanced technology credits.

m. Delegated assembly - Part 1037, Subpart G, 1037.621 of HDV Test Procedures

This provision applies to vehicle manufacturers that rely on secondary manufacturers to install certain technologies and components on their vehicles. The EO applicant is required to provide a report that describes its delegated assembly approach and the installation instructions required to bring the vehicle into a certified configuration.

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n. AC Leakage

The application for certification must include a report that demonstrates compliance with the air conditioning leakage standard in 40 CFR 1037.115 of the HDV Test Procedures.

o. Vehicle Label

Vehicle labels must conform to the label requirements specified in 13 CCR section 1965 and section 1035.135 of the HDV Test Procedures. The label may be submitted ahead of the application for preapproval or as part of the application.

p. Maintenance Schedule

Include the vehicle manufacturer's maintenance instructions in the certification application. The requirements are specified in section 1037.125 of the HDV Test Procedures.

q. Emissions Warranty

Manufacturers are required to furnish CARB with an electronic copy of the emission warranty statement for each vehicle family. The statement must include all of the information specified in 13 CCR section 2039.

3. Trailer Certification

The affected trailers are box-type trailers (dry van and refrigerated trailers), flat bed trailers, tank trailers, and container chassis. As provided in the CARB Advisory # 295 at <https://ww3.arb.ca.gov/enf/adv/adv295.pdf>, California is not enforcing the trailer standards of the CA Phase 2 GHG regulations for 2020 and 2021 model year trailers manufactured before January 1, 2022. Manufacturers may elect to voluntarily certify such trailers for the 2020 and 2021 model years, and CARB will continue to certify them to the CA Phase 2 standards. Manufacturers that certify such trailers must provide CARB with the following information:

a. Application

Manufacturers must demonstrate compliance with the applicable emissions standards or design standards specified in 17 CCR section 95663. For each trailer family, manufacturers must complete the California Phase 2 Heavy-Duty Greenhouse Gas Regulation Trailer Certification online application form at https://ww3.arb.ca.gov/cc/hdghg/meetings/trailer_cert/trailer_form.html.

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Guidance on completing the application form is provided on CARB's trailer certification website at

https://ww3.arb.ca.gov/cc/hdghg/meetings/trailer_cert/trailer_cert_guidance_document.pdf

b. Statement of Compliance

Manufacturers must submit a statement of compliance, including a statement that they are unconditionally certifying that all the trailers in the trailer family are built as described and comply with the requirements (Section 1037.205.A.2 of the HDV Test procedures).

c. Description of trailer

Describe the trailer subcategory (including the following information):

- Specification of the trailer family's regulatory subcategory as detailed in 40 CFR 1037.230, and provide justification for how it was determined
- The actual lengths of trailers in the family (to the nearest foot)
- Description of the work performing equipment installed at the rear of the trailer (e.g. rear lift gate and rear hinged ramp)
- Description of the work performing equipment installed at the side of the trailer (e.g. side lift gate, side-mounted pull-out platform, steps for side-door access, a drop-deck design, or belly boxes).
- Axle options for the trailer
- Weight reduction components
- Tire pressure system options and a description of their design/operation
- List of the standard components installed on the trailer family (for example, if all trailers in the family have an aluminum floor, etc.)
- A description of the trailer configuration projected to be produced in highest volume within the trailer family
- A description of the worst-case configuration for GHG emissions that will be available for sale
- If planning to use the transitional allowance, a list of the estimated number of exempted trailers to be produced
- Other relevant information

d. Description of Emission Control Systems (ECS) and GHG control strategies

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List all emission control systems including individual parts with part numbers that control GHG emissions. Also, provide a detailed description of their emission control strategies.

e. Proposed test plans (if applicable)

- Aerodynamic evaluation test to determine the change in the aerodynamic drag area, $\Delta C_d A$, of the complete trailer

If aerodynamic evaluation testing is required for certification, manufacturers must provide a test plan to determine the change in drag area ($\Delta C_d A$) of the complete trailer using the wind tunnel test procedure (detailed in 40 CFR 1037.526 and 40 CFR 1037.530) or using a CARB approved alternative procedure.

As an alternative, manufacturers may use data from CARB preapproved aerodynamic devices instead of performing the aerodynamic evaluation test on the complete trailer.

- To certify by applying data from a single CARB preapproved aerodynamic device, the following information must be included in the application:
 - i. The device manufacturer
 - ii. The EO number of the device
 - iii. The aero device and part number
 - iv. Measured $\Delta C_d A$ value in m^2
 - v. Designated aerodynamic bin
 - vi. The corresponding $\Delta C_d A$ from the designated Bin
- To certify by applying data from multiple CARB preapproved aerodynamic devices in combination (40 CFR 1037.526(c)), the following information must be included in the application:
 - i. The manufacturer(s) of the devices
 - ii. The EO number
 - vii. The aero devices and corresponding part numbers
 - iii. Measured $\Delta C_d A$ values (in m^2) for each device
 - iv. Designated bin of each device
 - v. Combined $\Delta C_d A$
- Tire rolling resistance (TRRL)

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Manufacturers must determine and report the Tire Rolling Resistance Level (TRRL) of the tires as described in 40 CFR 1037.520 (c). Alternatively, the test results may be obtained from the tire manufacturer or a third party with a signed statement from the party testifying that the tests were conducted according to the requirements in 40 CFR 1037.520(c)(4).

f. Wheel and Non-Wheel Weight Reduction Calculation Report (if applicable)

Compute and report the weight reduction for each trailer configuration using the procedure outlined in 40 CFR 1037.520(e)(2) for non-wheel weight reduction and 40 CFR 1037.520 (e)(1) for wheel weight reduction, as applicable.

g. Tire Pressure Monitoring Systems Information

Manufacturers must provide a description of the pressure monitoring system equipped on the trailer family. Manufacturers must also specify the axles on which they are installed.

h. Test Results (if applicable)

Submit results from the aerodynamic evaluation test, TRRL test and all other tests performed.

i. Equation 1037.515-1 (compliance equation) inputs and output files Report. (This does not apply to non-box trailers and non-aero box trailers)

Input Data

- Determine the inputs for the compliance equation using the procedure specified in the Table C.

Output Data

- Using the compliance equation calculate eCO₂ for each configuration of the trailer family.
- Report the highest calculated eCO₂. For full-aero dry and refrigerated box van certification, manufacturers participating in the ABT program (beginning with 2027 model year) must report eCO₂ for the configuration with the lowest calculated value and the configuration with the highest projected sales.

Table C: Trailer Compliance Input Parameters

Modeling Parameter

Method of Determining Parameter

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Trailer Tire Crr (kg/t)	40 CFR 1037.515(b)
Change in Aerodynamic Drag Area, ΔC_{dA} (m ²)	40 CFR 1037.515(c) and 40 CFR 1037.526(a)
Weight Reduction (WR)	40 CFR 1037.515(d) and (e)
Tire Pressure System	C ₅ = 0.988 for ATIS, 0.990 for TPMS or mix, 1 for none

Table 1 of 40 CFR 1037.515 lists regression coefficients (C₁ to C₄) for the compliance equation.

j. ABT Plans

Manufacturers must indicate their intention to participate in the ABT program by submitting their ABT plan and declaring the CO₂ FELs for their trailer families or subfamilies. The proposal must include all the requirements specified in 1037.725 of the HDV Test Procedures.

k. Warranty

Manufacturers must furnish CARB with an electronic copy of the emission warranty statement for each trailer. The statement must include all of the information specified in 13 CCR section 2039.

l. Label

Trailer labels must conform to the label requirements specified in 13 CCR section 1965 and section 1037.135 of HDV Test Procedures. All the applicable information listed in section 1037.135 (c) of the HDV Test Procedures must be included on the label. The label may be submitted ahead of the application for preapproval or as part of the application.

m. Maintenance schedule

Include the trailer manufacturer's maintenance instructions in the certification application. The requirements are described in section 1037.125 of the HDV Test Procedures.

n. Delegated Assembly

This provision applies to trailer manufacturers that rely on secondary manufacturers to install certain technologies and components on their trailers. The EO applicant is required to provide a report that describes its delegated assembly approach and the

installation instructions required to bring the trailer into a certified configuration.

o. Adjustable Operating Parameter Report

Provide a report that describes all adjustable operating parameters and their production operating ranges as specified in 40 CFR 1037.115 and 40 CFR 1037.205 (p). The description of each parameter must include:

- The nominal or recommended setting
- The intended physically adjustable range of the parameter
- The limits or stops used to establish the adjustable range, and
- Information on how limits or stops are effective in preventing adjustments to settings outside intended physically adjusted ranges on in-use vehicles.

Post-certification Activities

1. ABT reports

If participating in the federal ABT and CA ABT programs, the manufacturer must submit all values used in calculating positive or negative ABT emissions credits and send an end-of-year report within 90 days after the end of the model year and a final report within 270 days after the end of the model year. The final report must include all the information specified in Sections 1036.730 (b) and (c) of the HDDE Test Procedures (for diesel engines); Sections 1036.730 (b) and (c) of the HDOE Test Procedures (for Otto-cycle engines), and Sections 1037.730 (b) and (c) of the HDV Test Procedures for (medium- and heavy-duty vehicles and trailers). Appendix B to this MAC provides guidance on calculating positive and negative CA ABT credits.

2. Production reports

Within 90 days after the end of the model year, provide the U.S. and CA production volumes of each engine and vehicle family during the model year. For each vehicle, report the vehicle identification number, vehicle configuration, engine family name installed in the vehicle, and identify the vehicle subfamily identifier. Trailer manufacturers using the transitional provision specified in section 1037.150 (v) of the HDV Test Procedures must calculate and report the number of exempted trailers. Additionally, the report must include the number of uncertified vehicles sold to secondary vehicle manufacturers.

3. Record Keeping

All emissions tests data and all other information that has been generated for compliance with the regulations (in any format and on any media) must be readily available upon request for eight years after the issuance of an Executive Order.