

California Phase 2 GHG Trailer Certification

MARCH 25, 2019

Objective

- ❑ To provide further guidance to manufacturers in certifying trailers for sale in California
- ❑ California certification process is similar to that proposed by U.S. EPA during the U.S. EPA's Trailer Implementation Workshop held in November 2016

**Webcast Participants – Please e-mail
comments to the following address:**

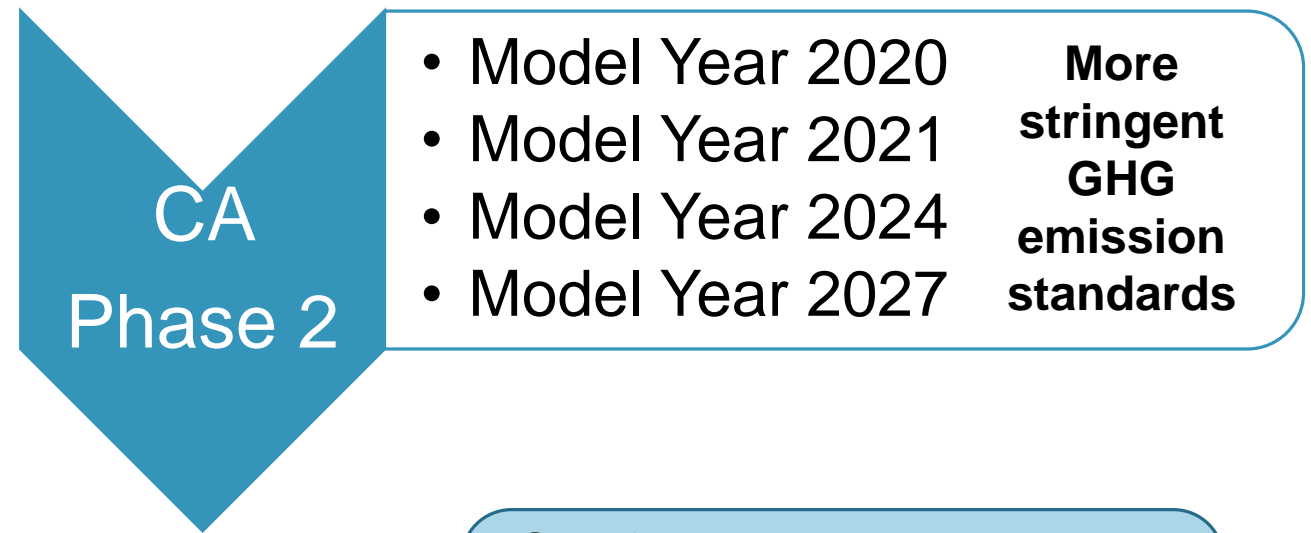
Auditorium@calepa.ca.gov

Outline

- ❑ Background
 - California Phase 2 GHG Trailer Requirements
 - Phase 2 Regulated Trailer Types
- ❑ Major Steps of Certification Process
 - Certification Application Form
 - Supporting Certification Documents
- ❑ California Warranty Process
- ❑ Key Dates
- ❑ More Information

California Phase 2 GHG Trailer Requirements

- ❑ Trailer manufacturers regulated for the first time
- ❑ Adopted California Phase 2 trailer standards equivalent to the U.S. EPA Phase 2 trailer standards in 2016
- ❑ Implementation begins with 2020 MY specifically trailers manufactured on or after January 1, 2020



California Phase 2 GHG Public Workshops

- Feb. 2017
- Aug. 2017

Phase 2 Regulated Trailer Types

- ❑ Long-box dry vans (greater than 50.0-feet in length)
- ❑ Long-box refrigerated vans (greater than 50.0-feet in length)
- ❑ Short-box dry vans (50.0-feet and shorter in length)
- ❑ Short-box refrigerated vans (50.0-feet and shorter in length)
- ❑ Tank trailers designed to transport liquids or gases
- ❑ Flatbed trailers with continuous, flat platforms
- ❑ Container chassis (all lengths)

Phase 2 GHG Trailer Standards

Full-aero Box-type Trailers

- Phase in standards:
 - 2020, 2021, 2024, 2027 MYs
- Trailer technologies:
 - Aerodynamic improvements
 - Low rolling resistance tires
 - Tire pressure systems (TPMS/ATIS)
 - Weight reduction

CO2 Standards (g/ton-mile)

Model Year	Dry Van		Refrigerated Van	
	Long	Short	Long	Short
2020	81.3	125.4	83.0	129.1
2021-2023	78.9	123.7	80.6	127.5
2024-2026	77.2	120.9	78.9	124.7
2027+	75.7	118.8	77.4	122.7

Long Box Trailers (>50')



Short Box Trailers (≤50')



Phase 2 GHG Trailer Standards

Partial-aero Box-type Trailers

❑ Less stringent standards

❑ Phase in standards:

- 2020, 2021+ MYs

❑ Trailer technologies:

- Aerodynamic improvements
- Low rolling resistance tires
- Tire pressure systems
- Weight reduction

CO2 Standards (g/ton-mile)

Model Year	Dry Van		Refrigerated Van	
	Long	Short	Long	Short
2020	81.3	125.4	83.0	129.1
2021+	80.6	123.7	82.3	127.5

Partial-aero box trailer



Trailers have side or rear work-performing equipment (WPE)

Work-Performing Equipment (WPE)

❑ Side WPE

- Side lift gate
- Side-mounted pull-out platform
- Steps for side-door access
- Drop-deck design
- Long belly boxes

❑ Rear WPE

- Rear lift gate
- Rear hinged ramp
- Roll-up doors until model year 2024

Demonstrating Compliance: Full- and Partial-Aero Box Vans Trailers

- ❑ Full- and partial-aero box van trailer manufacturers must calculate a projected CO₂ performance for each family based on modeled CO₂ emission rates using the compliance equation
 - **MY 2020–MY 2026**
 - ✓ A trailer family is considered in compliance with the emission standards if all configurations in that family have CO₂ emission rates at or below the applicable standards
 - ✓ For certification of each family, calculate for the highest projected CO₂ (worst performing) configuration
 - ✓ No averaging is available

❖ *More on slide 23 re: how family is defined*

Demonstrating Compliance: Full- and Partial-Aero Box Vans Trailers (cont.)

- Averaging program for box vans available MYs 2027+
 - Full-aero dry and refrigerated box vans only
 - Credits only apply to given model year (no carry-over)
 - In a given model year, averaging credits may be averaged within the two Averaging Sets: Long box vans and Short box vans

- **MY 2027 and later**
 - ✓ If not averaging, all configurations in a family must meet the standard
 - Calculate for the highest projected CO₂ (worst performing) configuration
 - ✓ If averaging, the projected production-weighted CO₂ average (including deficits) must meet applicable subcategory standard
 - Calculate for at least three subfamilies (highest CO₂/worst, lowest CO₂/best, and highest projected production)

Compliance Equation

Demonstrating compliance for each full-aero and partial-aero box-type trailer configuration based on equation

$$e_{\text{CO}_2} = (C_1 + C_2 \cdot \text{TRRL} + C_3 \cdot \Delta C_d A + C_4 \cdot \text{WR}) \cdot C_5$$

- Inputs: trailer type, tire rolling resistance level (TRRL), change in drag area (aerodynamics), weight reduction (WR), tire pressure system type
- e_{CO_2} represents the calculated CO2 emission rate (g/ton-mile) that is equivalent to running the GEM model with the same input values

Compliance Equation (cont.)

C1 to C5 are constant values for calculating CO₂ emissions

Table 1 of § 1037.515— Regression Coefficients for Calculating CO₂ Emissions

Trailer Category	C_1	C_2	C_3	C_4
Long dry box van	76.1	1.67	-5.82	-0.00103
Long refrigerated box van	77.4	1.75	-5.78	-0.00103
Short dry box van	117.8	1.78	-9.48	-0.00258
Short refrigerated box van	121.1	1.88	-9.36	-0.00264

$C_5 = 0.988$ (ATIS), 0.990 (TPMS or mix), 1.000 (none)

Phase 2 GHG Trailer Standards

Non-aero Box Vans and Non-box Trailers

- Phase in standards:
 - 2020, 2021+MYs
- Trailer technologies:
 - Low rolling resistance tires
 - Tire pressure systems

Design-Based Tire Standards

Trailer Type	Tire CRR (kg/metric-ton)		Tire Pressure System Type
	MY 2020	MY 2021+	
Non-Box	≤6.0	≤5.1	TPMS or ATIS
Non-Aero	≤5.1	≤4.7	TPMS or ATIS

Non-aero box trailer



Trailers >35' that have both side and rear WPEs, or refrigerated box vans <35' with one WPE

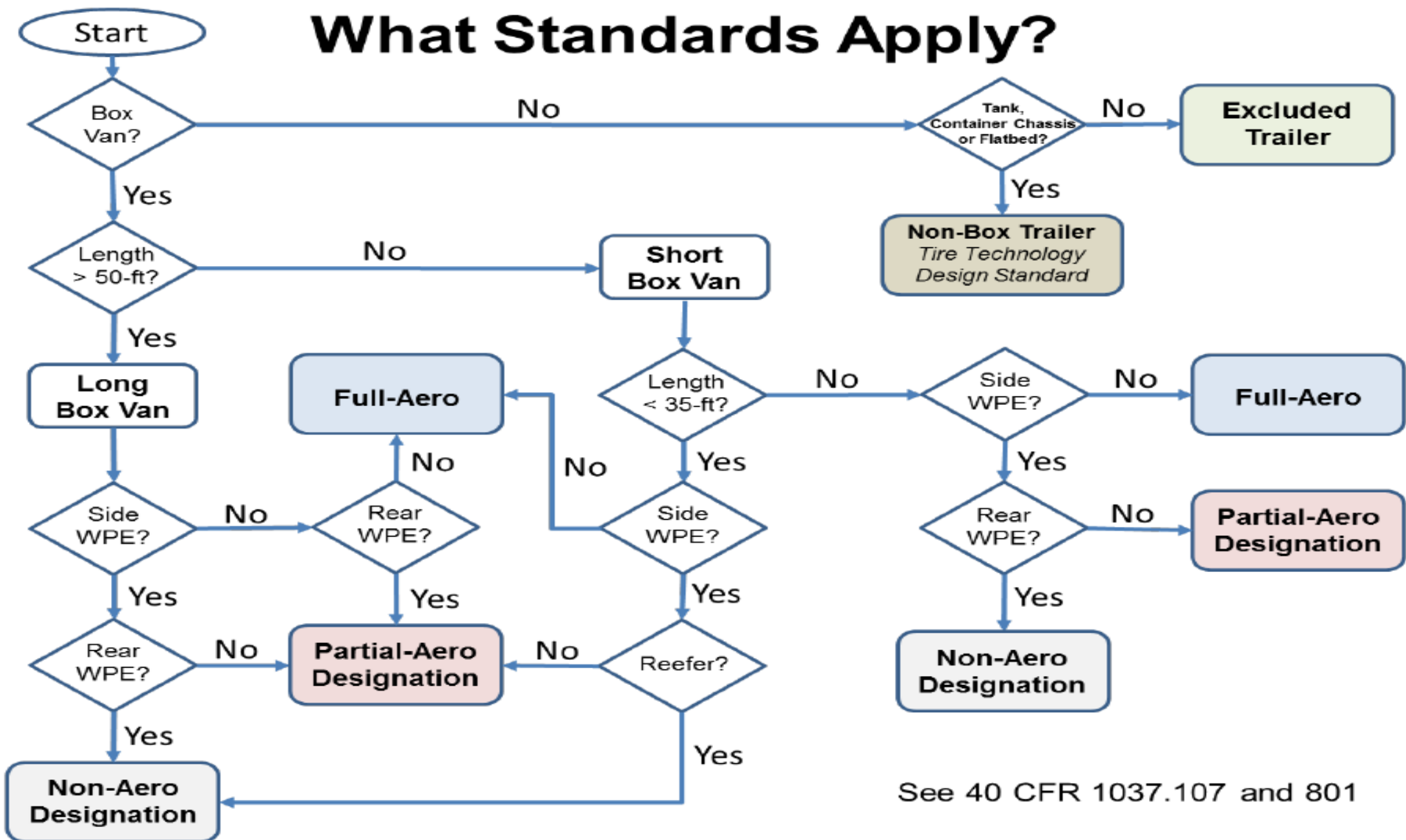
Non-box trailers
(flatbed, tank, and container chassis)



Excluded Trailers

- ❑ Non-box trailers that are not flatbed trailers, tank trailers, or container chassis
- ❑ Trailers meeting one or more of the following characteristics:
 - Trailers with 4+ axles (3+ axles if <35 feet)
 - Trailers with a gap of at least 120" between adjacent axle centerlines
 - Trailers intended for temporary or permanent residence, office space, or other work space such as campers, mobile homes, or carnival trailers
 - Trailers built before January 1, 2020
 - Note that the definition of “trailer” in §1037.801 excludes equipment that serves similar purposes but is not intended to be pulled by a tractor.

What Standards Apply?



See 40 CFR 1037.107 and 801

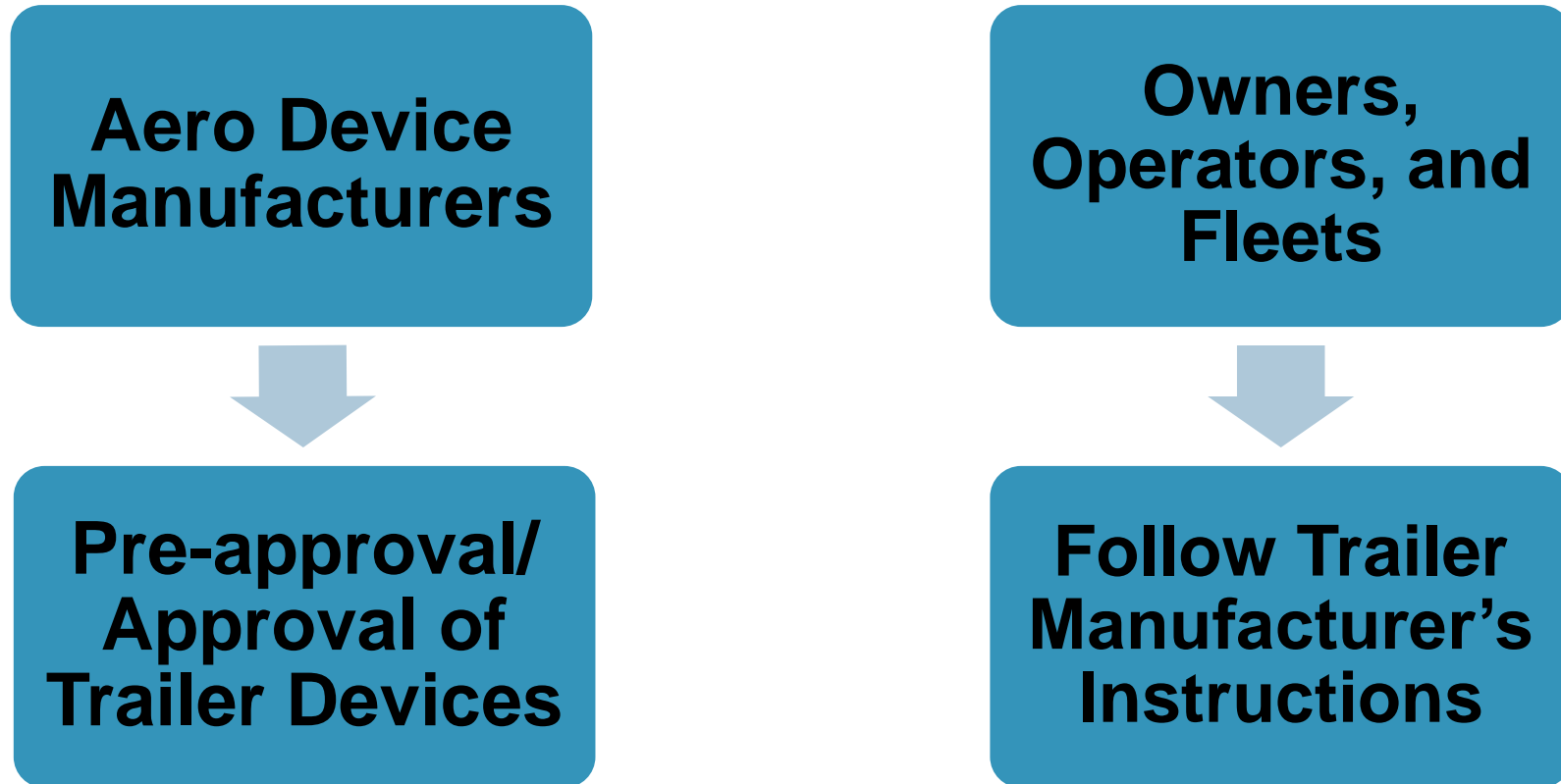
Off-cycle Technologies

- ❑ Off-cycle technology's performance is not captured in the trailer compliance equation (e.g., use of solar, regenerative breaking)
 - Test will determine the improvement factor applied to compliance equation
- ❑ A manufacturer wishes to use additional lightweight materials or weight reduction strategies not included in the regulations
 - Additional weight reduction is applied to the “WR” parameter in the compliance equation
- ❑ Contact TrailerCert@arb.ca.gov prior to conducting any off-cycle testing

Transitional Allowance for Trailers

- Transitional allowance for MYs 2020 to 2026 trailers:
 - Trailer manufacturer may specify 20% or 350 of certified box vans whichever is fewer for exemption
 - Trailer manufacturer may specify 20% or 250 of certified non-box trailers whichever is fewer for exemption
 - Label must state that trailer is exempt under provisions of 40 CFR 1037.150

Phase 2 GHG: Requirements for Device Manufacturers and Trailer Owners, Operators, and Fleets

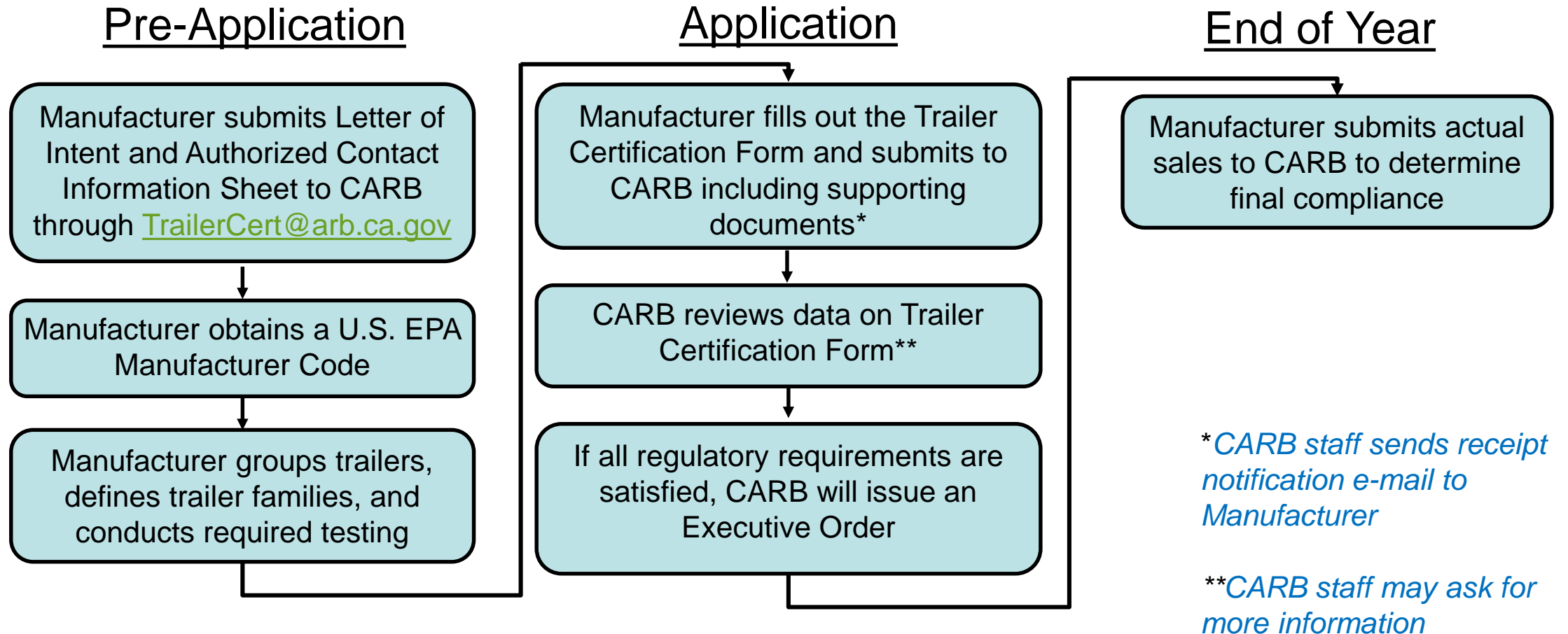


For Interim Aero Device Approval Program, email TTGHG.Interim-AeroApproval@arb.ca.gov

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- ❑ **Major Steps of Certification Process**
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Major Steps of Certification Process



Pre-Application

- ❑ Letter of Intent (template will be provided)
- ❑ Authorized Contact Information (template will be provided)
- ❑ U.S. EPA Manufacturer Code
- ❑ Register for a unique manufacturer code to U.S. EPA following the instructions at <https://www.epa.gov/vehicle-and-engine-certification/users-guide-registering-company-manufacturer-code-verify>
- ❑ Use your existing manufacturer code for manufacturers who got their manufacturer code for trailers from U.S. EPA
- ❑ Provide a copy of the email with the assigned 3-character manufacturer code to CARB

Pre-Application (cont.)

- ❑ Group trailers, define families
 - Ten trailer subcategories with unique standards
 1. Full-aero long box dry vans
 2. Full-aero long box refrigerated vans
 3. Full-aero short box dry vans
 4. Full-aero short box refrigerated vans
 5. Partial-aero long box dry vans
 6. Partial-aero long box refrigerated vans
 7. Partial-aero short box dry vans
 8. Partial-aero short box refrigerated vans
 9. Non-aero box vans
 10. Non-box trailers
 - Typically each subcategory is a family
 - May combine families to reduce the number of Executive Orders required

Summary of Regulatory Structure

	Subcategory	Family	Subfamily	Vehicle Configuration	Vehicle
Description	10 Trailer subcategories	Typically one family per vehicle subcategory; subcategories may be combined into fewer families	(only for averaging) A subfamily is a group of vehicle configurations within a family that have the same family emissions limit (FEL)	A vehicle configuration is a set of vehicles with the same set of component configurations	Each trailer produced is a vehicle with a unique Vehicle Identification Number (VIN)
Example	Full-aero long dry van Non-box trailers	Full-aero long dry van + full-aero long refrigerated van	Family standard is 81 g/ton-mi; FELs may be 80 g/ton-mi, 84 g/ton-mi, etc.	Aero configuration has similar aero bin Tire configuration has same tire rolling resistance level	
Regulatory Use	The subcategory determines the CO2 emission standard	Certification is based on the family <ul style="list-style-type: none"> • One cert application per family • One Executive Order issued for each family 	Each subfamily has its own FEL which becomes the emission standard for every vehicle in the subfamily; production-averaged FELs must meet the family standard	Compliance equation used for each configuration in end-of-year report	<ul style="list-style-type: none"> • Each vehicle has its own label • Recordkeeping is required for each vehicle • In-use audit • Recall

Pre-Application (cont.): Trailer Family

- Trailer families are identified with a 12-digit name

Example: **LABC3TRLRM01**

Position	Code	Description
1	L	Model year code for 2020
2-4	ABC	U.S. EPA manufacturer code
5	3	Industry sector code for HD Highway Trailers
6-9	TRLR	Family type descriptor for Trailer
10-12	M01	Manufacturer assigned characters used to create a unique family name

Pre-Application (cont.)

- Evaluate technologies
- Choose appropriate technologies to meet the standards
 - For full- and partial-aero,
 - ✓ Conduct/contract out necessary pre-certification testing for aerodynamic devices, tires, off-cycle technologies
 - Provide a proposed test plan for aerodynamic devices and off-cycle technologies
 - ✓ Determine other compliance equation inputs (tire pressure system, weight reduction)
 - ✓ Apply the inputs into the compliance equation

Compliance Equation Input: Aerodynamic Improvement ($\Delta C_d A$)

- ❑ If using pre-approved aerodynamic devices
 - Get measured $C_d A$ value in m^2 , reported to 2 decimal places
 - Determine designated aerodynamic bin
 - Use the appropriate $\Delta C_d A$ value
- ❑ If conducting own testing
 - Collect data from Phase 2 test procedures for wind-tunnel, CFD, or coastdown testing
 - Submit $\Delta C_d A$ to CARB, determine designated aerodynamic bin, and appropriate $\Delta C_d A$ value
 - Data may be resubmitted annually for compliance

Calculating C_dA Value for Multiple Pre-Approved Aerodynamic Devices on a Single Trailer Configuration

- Allows trailer manufacturers to use multiple devices with individually pre-approved test data on a single trailer configuration
 - Each device does not impair the effectiveness of other devices
 - Good engineering judgment
- Determine an appropriate delta C_dA value
 - Fully account for the technology with largest delta C_dA value
 - Discount the second by 10 percent (multiply the second by 0.90)
 - Discount each of the remaining additional technologies by 20 percent (multiply each remaining additional technologies by 0.80)

Example for calculating multiple pre-approved aerodynamic devices

A manufacturer applying three separately tested devices with delta C_dA values of 0.40, 0.30, and 0.10.

Calculate the combined delta C_dA as:

$$\text{Delta } C_dA = 0.40 + (0.90 \times 0.30) + (0.80 \times 0.10) = 0.75$$

- 0.75 → Bin IV
- value for delta $C_dA = 0.7 \text{ m}^2$

Table 2 of § 1037.515—Bin Determinations for Trailers Based on Aerodynamic Test Results

(ΔC_dA in m^2)		
If a trailer's measured ΔC_dA is ...	designate the trailer as ...	and use the following value for ΔC_dA
≤ 0.09	Bin I	0.0
0.10 – 0.39	Bin II	0.1
0.40 – 0.69	Bin III	0.4
0.70 – 0.99	Bin IV	0.7
1.00 – 1.39	Bin V	1.0
1.40 – 1.79	Bin VI	1.4
> 1.80	Bin VII	1.8

Compliance Equation Input: Tire Rolling Resistance Level (TRRL)

- ☐ Measured as coefficient of rolling resistance (CRR)
- ☐ Units of kg/metric ton
- ☐ Reported to 1 decimal place
- ☐ Based on ISO 28580 standard
- ☐ Get CRR data from tire manufacturers

Compliance Equation Input: Weight Reduction (WR)

❑ Box van manufacturers that install any of the technologies in Table 3 directly apply the specified weight reduction values

- A positive value
- Measured in pounds
- Reported to the nearest integer

Table 3 of § 1037.515—Weight Reductions for Trailers (pounds)

Component	Material	Weight Reduction (pounds)
Structure for Suspension Assembly ¹	Aluminum	280
Hub and Drum (per axle)	Aluminum	80
Floor ²	Aluminum	375
Floor ²	Composite (wood and plastic)	245
Floor Crossmembers ²	Aluminum	250
Landing Gear	Aluminum	50
Rear Door	Aluminum	187
Rear Door Surround	Aluminum	150
Roof Bows	Aluminum	100
Side Posts	Aluminum	300
Slider Box	Aluminum	150
Upper Coupler Assembly	Aluminum	430

¹ For tandem-axle suspension sub-frames made of aluminum, apply a weight reduction of 280 pounds. Use good engineering judgment to estimate a weight reduction for using aluminum sub-frames with other axle configurations.

² Calculate a smaller weight reduction for short trailers by multiplying the indicated values by 0.528 (28/53).

Compliance Equation Input: Tire Pressure Systems

- ❑ Full- and partial-aero box van manufacturers can optionally install TPMS/ATIS
- ❑ Systems must be on wheels on all axles
- ❑ No testing required
 - ATIS assigned an effectiveness value of 0.988 (1.2% improvement)
 - TPMS or mix of ATIS and TPMS assigned an effectiveness value of 0.990 (1.0% improvement)
 - No TPMS/ATIS applies a value of 1.000 (zero improvement)

Note: TPMS or ATIS are required on non-box and non-aero box trailers

Example for calculating mass of CO₂ emissions (e_{CO_2}) for long dry box van

A long dry box van has TPMS for all wheels, an aluminum suspension assembly, aluminum floor, measured delta C_dA is 0.75, and TRRL is 4.6:

- C_1 to C_5 input values
- $C_1 = 76.1$
- $C_2 = 1.67$
- $C_3 = -5.82$
- $C_4 = -0.00103$
- $C_5 = 0.990$

Table 1 of § 1037.515—Regression Coefficients for Calculating CO₂ Emissions

Trailer Category	C_1	C_2	C_3	C_4
Long dry box van	76.1	1.67	-5.82	-0.00103
Long refrigerated box van	77.4	1.75	-5.78	-0.00103
Short dry box van	117.8	1.78	-9.48	-0.00258
Short refrigerated box van	121.1	1.88	-9.36	-0.00264

$C_5 = 0.988$ (ATIS) **0.990 (TPMS or mix)** 1.000 (none)

Example for calculating mass of CO2 emissions (e_{CO_2}) for long dry box van (cont.)

A long dry box van has TPMS for all wheels, an aluminum suspension assembly, aluminum floor, measured delta C_dA is 0.75, and TRRL is 4.6:

- Measured C_dA value of 0.75 m²
- Designated as Bin IV
- Value for delta $C_dA = 0.7$ m²

Table 2 of § 1037.515—Bin Determinations for Trailers Based on Aerodynamic Test Results (ΔC_dA in m²)

If a trailer's measured ΔC_dA is ...	designate the trailer as ...	and use the following value for ΔC_dA
≤ 0.09	Bin I	0.0
0.10 – 0.39	Bin II	0.1
0.40 – 0.69	Bin III	0.4
0.70 – 0.99	Bin IV	0.7
1.00 – 1.39	Bin V	1.0
1.40 – 1.79	Bin VI	1.4
> 1.80	Bin VII	1.8

Example for calculating mass of CO2 emissions (e_{CO_2}) for long dry box van (cont.)

A long dry box van has TPMS for all wheels, an aluminum suspension assembly, aluminum floor, measured delta C.A is 0.75, and TRRL is 4.6:

- WR = 655 lbs → 280 + 375 lbs

Table 3 of § 1037.515—Weight Reductions for Trailers (pounds)

Component	Material	Weight Reduction (pounds)
Structure for Suspension Assembly ¹	Aluminum	280
Hub and Drum (per axle)	Aluminum	80
Floor ²	Aluminum	375
Floor ²	Composite (wood and plastic)	245
Floor Crossmembers ²	Aluminum	250
Landing Gear	Aluminum	50
Rear Door	Aluminum	187
Rear Door Surround	Aluminum	150
Roof Bows	Aluminum	100
Side Posts	Aluminum	300
Slider Box	Aluminum	150
Upper Coupler Assembly	Aluminum	430

¹ For tandem-axle suspension sub-frames made of aluminum, apply a weight reduction of 280 pounds. Use good engineering judgment to estimate a weight reduction for using aluminum sub-frames with other axle configurations.

² Calculate a smaller weight reduction for short trailers by multiplying the indicated values by 0.528 (28/53).

Example for calculating mass of CO2 emissions (e_{CO_2}) for long dry box van (cont.)

A long dry box van has TPMS for all wheels, an aluminum suspension assembly, aluminum floor, measured delta C_dA is 0.75, and TRRL is 4.6:

- $C_1 = 76.1$, $C_2 = 1.67$, $C_3 = -5.82$, $C_4 = -0.00103$, and $C_5 = 0.990$
- TRRL = 4.6 kg/tonne
- Delta $C_dA = 0.7 \text{ m}^2$
- WR = 655 lbs

$$e_{\text{CO}_2} = (C_1 + C_2 \cdot \text{TRRL} + C_3 \cdot \Delta C_dA + C_4 \cdot \text{WR}) \cdot C_5$$

$$e_{\text{CO}_2} = (76.1 + (1.67 \cdot 4.6) + (-5.82 \cdot 0.7) + (-0.00103 \cdot 655)) \cdot 0.990$$

$$e_{\text{CO}_2} = 78.2 \text{ g/ton-mile}$$

CO2 Emission Standard is 81.3 g/ton-mile

Application

Application

- ❑ Complete application package including additional supporting documents
 - Send via email to TrailerCert@arb.ca.gov
 - Email subject must contain

REQUEST_[Process Code]_CERTIFICATION_[U.S. EPA Manufacturer Code]_[Model Year]TRAILER

Example

REQUEST_NEW SUBMISSION_CERTIFICATION_ABC_2020MY TRAILER

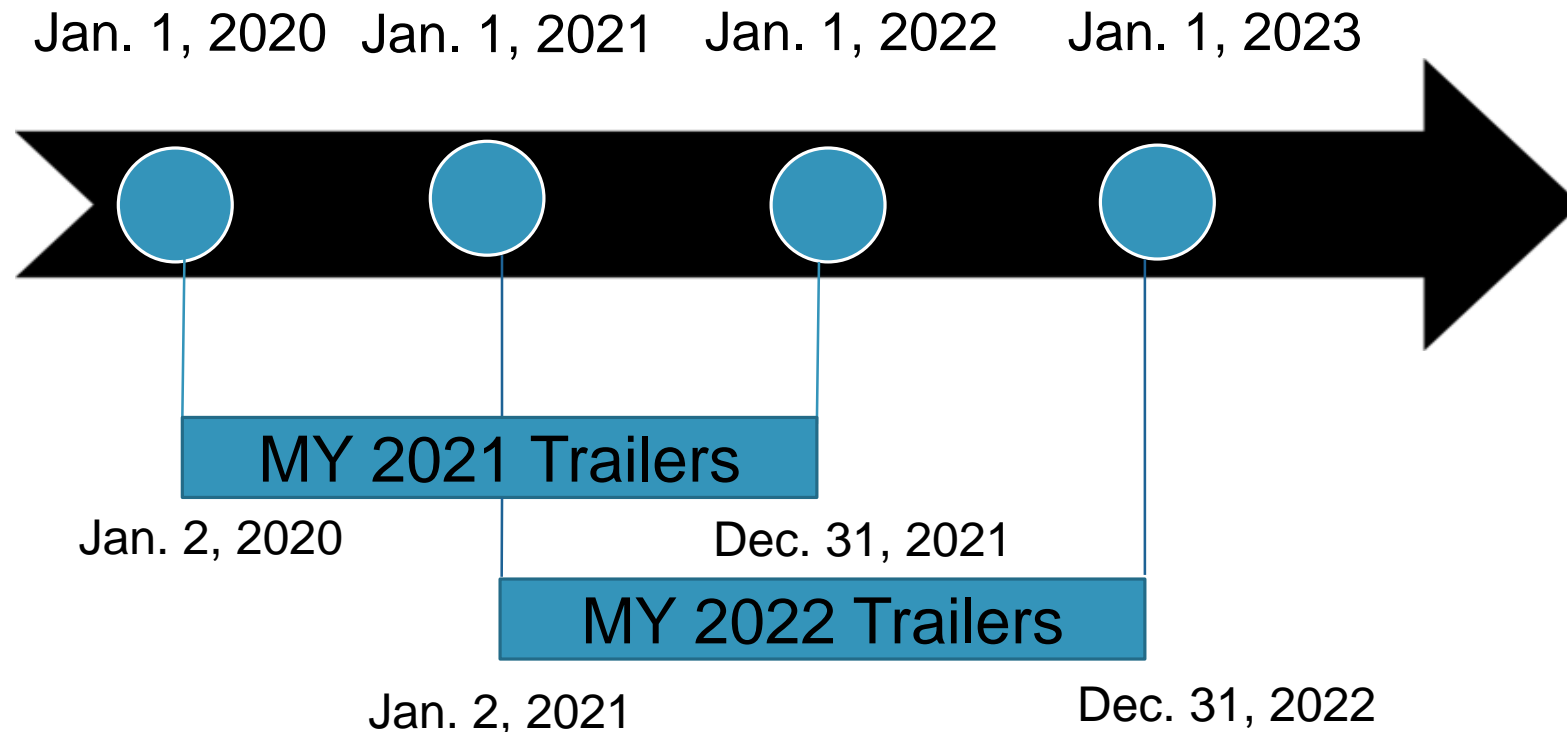
Model Year must include January 1 of the calendar year for which the MY is named, may not begin before January 2 of the previous calendar year, and it must end by December 31 of the named calendar year

- May be set to match the calendar year corresponding to the date of manufacture

Application (cont.): Model Year Examples

Date of manufacture: Aug. 1, 2021

May manufacture 2021 and 2022 Model Year Trailers



Application (cont.): Process Code

- Type of application being submitted
 - New Submission – first time to submit certification application for specific trailer family in a model year
 - Correction – change to application
 - Running Change – make post certification changes to current model year trailers, such as
 - ✓ Add a vehicle configuration to a trailer family
 - ✓ Change a vehicle configuration already included in a trailer family in a way that may affect emissions or change components described in the application
 - ✓ Include additional technologies (aerodynamic devices, tires, etc.)
 - ✓ Modify a Family Emissions Limit for a trailer family


Application (cont.)

- Fill out the trailer certification application (web form)
 - Works on Edge, IE9+, Firefox, and Google Chrome
- Send the completed web form (“XML” file)
- Send supporting documents
 - May combine all information into one electronic file
 - List of required information that must be provided:
 - ✓ Statement of compliance
 - ✓ Aerodynamics test results
 - ✓ Tire information
 - ✓ Labeling
 - ✓ Warranty document
 - ✓ Maintenance instructions
 - ✓ Other relevant supporting documents (if any)
- Upon review and approval by CARB, an Executive Order will be issued

Filling Out Certification Application Form

Heavy-Duty Highway Trailer Submission Form: User Information

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Heavy-Duty Highway Trailer Submission Form

User Information General Information Component Information Emission Determination

User Information


EPA Manufacturer Code:	<input type="text"/>	Contact's Job Title / Position:	<input type="text"/>
Manufacturer Name:	<input type="text"/>	First Name:	<input type="text"/>
Company Address:	<input type="text"/>	Last Name:	<input type="text"/>
City:	<input type="text"/>	Email address:	<input type="text"/>
State:	<input type="text"/>	Phone Number:	<input type="text"/>
Zipcode:	<input type="text"/>		

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 Import Application  Save Application  Check For Errors

Heavy-Duty Highway Trailer Submission Form: General Information

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Heavy-Duty Highway Trailer Submission Form

User Information **General Information** Component Information Emission Determination

General Information

Process Code:

Trailer Family Name:

Model Year:

Field Edits/Changes/Corrections(1000 characters available):

Trailer Family Subcategory:

Are you combining dissimilar trailer subcategories into a single family according to 1037.230(d)(3)?:

Trailer Configuration

Trailer Configuration - 1

Trailer Aerodynamic Category: Trailer Climate Control Type: Trailer Length (ft.):


For Partial-Aero or Non-Aero Trailers Only

Rear Work Performing Equipment:

Side Work Performing Equipment:

Heavy-Duty Highway Trailer Submission Form: Component Information

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Heavy-Duty Highway Trailer Submission Form

User Information

General Information

Component Information

Emission Determination

Component Information

Emission Control Identifier (Please select all that apply):

Nothing selected

Aerodynamic Equipment

Are any aerodynamic improvement devices used on this trailer family?

No

Tire Pressure Systems

Are there any Tire Pressure Systems installed on this trailer family?

No

Tire Configurations

Local CSV File:

Choose file

Browse


Upload Tire Configurations from a CSV File

You can upload Tire Configurations for your Trailer Family from a properly formatted CSV from your (manufacturer) workstation.
WARNING: Tire Configurations uploaded from this file will replace any tire configurations you may have already entered!

Selected <input type="checkbox"/>	Tire Manufacturer	Tire Model	Tire Size	Tire Crr(metric ton)	Edit/Delete
<div><div>Tire Manufacturer:<div></div></div><div>Tire Crr(kg/metric ton):<div></div></div><div>Tire Model:<div></div></div><div>Tire Size:<div></div></div><div>+ Add Tire Configuration</div></div>					

Heavy-Duty Highway Trailer Submission Form: Emission Determination

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Heavy-Duty Highway Trailer Submission Form

User InformationGeneral InformationComponent InformationEmission Determination

Emission Determination

CO2 Trailer Configuration Type	Lowest Projected CO2 Trailer Configuration	Highest Projected CO2 Trailer Configuration	Highest Projected Sales Volume CO2 Trailer Configuration
Tire Crr (kg/metric ton)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Configuration Aerodynamic Improvement Indicator	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>
Configuration Composite Delta CdA (m2)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total Weight Reduction (lbs)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Tire Pressure System	<input type="text"/>	<input type="text"/>	<input type="text"/>
Configuration Off-Cycle Improvement Factor	<input type="text"/>	<input type="text"/>	<input type="text"/>
Off-Cycle Separate Credit Amount (g CO2/ton-mile)	<input type="text"/>	<input type="text"/>	<input type="text"/>

Note: Only the worst case (Highest Projected CO2 Trailer Configuration) needs to be filled out until 2027.

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Save Application

Check For Errors

Supporting Documents: Statement of Compliance

- ☐ Unconditionally certify that all the vehicles in the trailer family are built as described and comply with the requirements

Example:

Vehicle Families: LABC3TRLRM01, LABC3TRLRM02, LABC3TRLRM03

ABC International unconditionally certifies that the trailers described in the accompanying application for certification comply with the requirements of title 17, CCR sections 95660 through 95664 applicable to trailers

Supporting Documents: Aerodynamics Test Results

Example sets of aerodynamic documents

- ❑ Pre-approved aerodynamic device
 - Device and device manufacturer description(s)
 - Copy of Executive Order for pre-approved aerodynamic devices
- ❑ Aerodynamic testing conducted by applicant submitted and approved in pre-certification process
 - Description of testing facility and test protocol
 - Description of the test vehicles, both as baseline “A” and with improvements “B”
 - Summary of test results including necessary calculations
 - Aerodynamic bin(s) for each configuration

Supporting Documents: Tire Information

- ❑ Copy of letter from the Tire Manufacturer or Test Lab confirming rolling resistance results
- ❑ Contains tire configuration information
 - Tire Manufacturer
 - Tire Model
 - Tire Size
 - Tire CRR

Example

Tire Manufacturer	Tire Model	Tire Size	Tire CRR
BFGoodrich	BFG1	185R17	11.2
Goodyear	Test1	185R17	7

Supporting Documents: Labeling

- ❑ Each trailer has its own permanent emission-control information label
 - To demonstrate label compliance, first time manufacturers must submit one copy of an actual label to their assigned CARB certification staff via mail (physical address would be provided)
- ❑ Provide a sample trailer label with the following information:
 - Heading: “VEHICLE EMISSION CONTROL INFORMATION”
 - Corporate name and trademark
 - Vehicle identification number
 - Trailer family
 - Regulatory subcategory
 - Date of manufacture
 - Emission Control System (identifiers shown in Appendix III to 40 CFR part 1037)
 - Compliance Statement “THIS VEHICLE COMPLIES WITH CALIFORNIA REGULATIONS FOR [MODEL YEAR] HEAVY-DUTY VEHICLES.”

Emission Control Identifiers for Label

Component	Description	Identifier
Tires	Low rolling resistance tires (all)	LRRA
Aerodynamic	Gap reducing trailer fairing (tractor to trailer gap)	TGRT
	Trailer aerodynamic side skirt	TATS
	Trailer aerodynamic rear fairing	TARF
	Trailer aerodynamic underbody device	TAUD
Other	Automatic tire inflation system	ATI
	Tire pressure monitoring system	TPMS
	Weight-reducing trailer wheels	WRTW
	Weight-reducing trailer upper coupler plate	WRTC
	Weight-reducing trailer axle sub-frames	WRTS
	Wide-base single trailer tires with steel wheel	WBSW
	Wide-base single trailer tires with aluminum wheel	WBAW
	Wide-base single trailer tires with light-weight aluminum alloy wheel	WBLW
	Dual-wide trailer tires with steel wheel	DWSW
	Dual-wide trailer tires with aluminum wheel	DWAW
	Dual-wide trailer tires with light-weight aluminum alloy wheel	DWLW

Sample Trailer Label

- ❑ Manufacturers may submit your own label format

<i>Company's Trademark</i>	Corporate Name VEHICLE EMISSION CONTROL INFORMATION	
Conforms to regulations: 2020 MY Full-Aero Long Dry Van Trailer		
California: HD Highway Trailer		Date: 06/01/2019
No adjustments needed.	LRRRA, TATS, ATI	
VIN: 1ABCD12345L109876 Trailer Family: LABC3TRLRM01	<i>Part # Bar Code Here</i>	Label Part Number
THIS VEHICLES COMPLIES WITH CALIFORNIA REGULATIONS FOR 2020 MODEL YEAR HEAVY-DUTY VEHICLES.		

Supporting Documents: Warranty Document

- ❑ Include a copy of the emissions warranty statement provided to consumers for purposes of application for certification
- ❑ The general requirement is that the product is designed and built so it conforms at the time of sale with GHG requirements
- ❑ Warranty periods:
 - 5 years for emissions-related components (except tires)
 - 1 year for tires
 - Warranty period cannot be shorter than any warranty of a component that you provide to the owner without charge

Supporting Documents: Warranty Document (cont.)

- ❑ Components covered include all components whose failure would increase a vehicle's GHG emissions, including:
 - Aerodynamic technologies
 - Tires
 - Tire pressure systems
 - Lightweight components
 - Other added emission-related components to the extent they are included in the application for certification
- ❑ Describe the emission-related warranty provisions in the owners manual

Supporting Documents: Maintenance Instructions

- ❑ Include the maintenance instructions you will give to the ultimate purchaser
- ❑ Critical emission-related maintenance
 - You may schedule critical emission-related maintenance on these components if you demonstrate that the maintenance is reasonably likely to be done at the recommended intervals on in-use vehicles
- ❑ Tire maintenance and replacement
 - Include instructions that will enable the owner to replace tires so that the vehicle conforms to the original certified vehicle configuration

Supporting Documents: Maintenance Instructions (cont.)

- ❑ Explain the owner's responsibility for proper maintenance in the owners manual
- ❑ Amending maintenance instructions
 - Send written request to amend your application for certification for a trailer family if you want to change the emission-related maintenance instructions
 - Describe the proposed changes to the maintenance instructions

Reporting and Recordkeeping

- ❑ An end-of-year production report must be submitted within 90 days after the end of the model year and include the following information:
 - Total U.S.- and California-directed production volume per trailer family
 - Vehicle identification number, vehicle configuration and subfamily for each vehicle
 - Uncertified vehicles sold to secondary vehicle manufacturers
 - Trailers exempt under the transitional allowance flexibility
 - Manufacturer average CO₂ performance by subcategory
- ❑ Keep required data from emission tests and all other information for eight years after issuance of Executive Order
- ❑ Store these records in any format and on any media
 - Records must be readily available

Outline

- ❑ Background
 - California Phase 2 GHG Trailer Requirements
 - Phase 2 Regulated Trailer Types
- ❑ Major Steps of Certification Process
 - Certification Application Form
 - Supporting Certification Documents
- ❑ **California Warranty Process**
- ❑ Key Dates
- ❑ More Information

Emission Warranty Information Report (EWIR) CCR Section 2144

- ❑ Manufacturers must monitor the unscreened warranty claim rate for emission-related components that fail in customer use for each trailer family
- ❑ An EWIR report must be submitted when warranty claims reach a 1% or 25 unscreened warranty claims (whichever is greater) level is reached
- ❑ EWIR reports are submitted on a quarterly basis
- ❑ EWIR reports are typically required to be submitted for the duration of the warranty reporting period unless otherwise noted

How to submit an EWIR Report

- ❑ Instructions on how to format and submit EWIR reports electronically can be found in the Manufacturers Advisory Correspondence (MAC) #2017-01
- ❑ MAC 2017-01 provides instructions on how to format reports and also notifies manufacturers about what information to include. EWIR reports must be in a specific format and must include all of the required information or they will be rejected.
- ❑ Reports are typically compiled in spreadsheets and submitted via e-mail as CSV files.
- ❑ Files are e-mailed to Esther Gonzales (Esther.Gonzales@arb.ca.gov), and cc to FOWSWarranty@arb.ca.gov.

EWIR Example in a CSV Format:

Test Group,Part_Num,Component,Repair,Cost,Sales,Claims,Percent,Qtr,Models,Fuel_Code,GVWR
ARBAB01.2345,123456789,GAS CAP,N,L,9473,143,1.5,2012Q1,MODEL-MODEL-MODEL,G,1234

Field Information Report (FIR)

CCR Section 2145

- ❑ Manufacturers are required to submit an FIR report within 45 days of submitting an EWIR report that indicates that the unscreened warranty claims are at a 4% or 50 (whichever is greater) level
- ❑ FIRs must include the following information:
 - A description of the emission-related component's failure and the probable cause for its failure
 - The true failure rate of the trailer family
 - A projection of the total number and percentage of unscreened warranty claims and valid failures expected during the useful life
 - An estimated date of when the valid failure rate is expected to exceed the corrective action threshold listed in CCR 2143
 - The complete list of requirements can be found in CCR 2145

Field Information Report (FIR)

CCR Section 2145 (cont.)

- ❑ There is not a prescribed format for FIRs reports. Most manufacturers simply list the requirements in CCR 2145 and provide their responses below each requirement
- ❑ Manufacturers submit hardcopies of reports to the address specified in CCR 2145(b)

Emission Information Report (EIR)

CCR Section 2146

- ❑ Manufacturers are required to submit an EIR report when screened warranty claims reach a 4% or 50 (whichever is greater) failures level, regardless of whether they are specifically requested by CARB
- ❑ EIRs must include the following information:
 - A description of the component that failed, the failure, and probable cause of failure
 - A description of the impact on emissions that the failure will have over the useful life
 - A description of the impact on drivability, fuel economy, and performance.
 - Any available emissions data that can help to evaluate the impact that the failure will have on emissions
 - The complete list of requirements can be found in CCR 2146

Emission Information Report (EIR)

CCR Section 2146 (cont.)

- ❑ There is not a prescribed format for EIRs reports. Most manufacturers simply list the requirements in CCR 2146 and provide their responses below each requirement
- ❑ Manufacturers submit hardcopies of reports to the address specified in CCR 2146(c)

Corrective Action

- ❑ Manufacturers are subject to corrective action after a true failure rate of 4% is reached or 50 failures have occurred (whichever is greater)
- ❑ Corrective action is typically in the form of an extended warranty or recall
- ❑ Corrective action plans must meet specific requirements outlined in CCR Sections 2111-2120
- ❑ The DMV tie-in program (CCR Section 2117) must be used when conducting recalls. The program requires manufacturers to submit vehicle information for vehicles that have not had the recall repair work performed. CARB works with the DMV to ensure that the affected vehicles cannot have their registration renewed until after the recall repair work has been performed. This ensures a high capture.

Warranty Contact Information

- ❑ Esther Gonzales Esther.Gonzales@arb.ca.gov
- ❑ Adil Mahmood Adil.Mahmood@arb.ca.gov
- ❑ Jeffrey Wong, P.E. Jeffrey.Wong@arb.ca.gov

Outline

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Key Dates

- ❑ **Feb. 7, 2019** - Office of Administrative Law (OAL) approved Phase 2 GHG rulemaking, and filed with Secretary of State
- ❑ **Mar. 25, 2019** - Trailer Certification Workshop
- ❑ **Apr. 1, 2019** - Effective date, trailer certification application may be submitted to CARB
- ❑ **Jan. 1, 2020** - Start of trailer program
- ❑ **Mar. 31, 2021** - Submit end-of-year production report for 2020 MY

More Information

A copy of this presentation and guidance documents will be available at:
CA Phase 2 Trailer Certification

For trailer certification questions, email at TrailerCert@arb.ca.gov

If you wish to receive future trailer cert information, please sign up at:
CA Phase 2 email list

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