CALIFORNIA
AIR RESOURCES BOARD

Omnibus Amendments Workshop

Manufacturer-Run In-Use Testing Program

March 20, 2024

Heavy-Duty In-Use Testing (HDIUT) Program Harmonization Overview

- Among in-use test program discrepancies between U.S. Environmental Protection Agency (U.S. EPA) Clean Trucks Plan (CTP) and CARB's Omnibus regulations, CARB staff is proposing to align with U.S. EPA's CTP regulations with a few exceptions outlined below:
  - Use of commercially available (biodiesel) fuel for In-Use testing as in Omnibus regulation – PART 86 II. Subpart T. 86.1910.A.2.2(ii) and 2.3(ii)
  - Compliance determination criteria based on the number of pass/fail tests (in addition to the average sum-over-sum (SOS) emission) when three or more vehicles fail the same pollutant and same bin as in Omnibus regulation – PART 86 II. Subpart T. 86.1915.B.3.1 (same as CCR § 2140(c))
  - Use of Portable Emissions Measurement Systems (PEMS) or chassis dynamometer for in-use compliance (IUC) testing for idling emissions per Omnibus regulation – PART 86 II. Subpart N. 86.1370.B.7

In-Use Testing Program Harmonization Overview

- Staff is proposing to align CARB's Omnibus regulations with U.S. EPA's CTP regulations for HDIUT with a few exceptions outlined below:

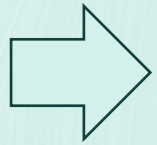
Item	Retaining Omnibus Regulation	Regulation Citation
1	Use of commercially available (biodiesel) fuel for In-Use Testing as in Omnibus regulation	40 CFR Part 86 II. Subpart T. 86.1910.A.2.2(ii) and 2.3(ii)
2	Compliance determination criteria based on the number of pass/fail tests (in addition to the average SOS emission) when three or more vehicles fail the same pollutant and same bin as in Omnibus regulation	40 CFR Part 86 II. Subpart T. 86.1915.B.3.1 (same as CCR § 2140(c))
3	Use of PEMS or chassis dynamometer for IUC testing for idling emissions per Omnibus regulation	40 CFR Part 86 II. Subpart N. 86.1370.B.7

1. Use of Commercially Available (Biodiesel) Fuel

- U.S. EPA understands that manufacturers have little control over quality of fuel over years of in-use operation.
- CARB staff believes the in-use testing program is intended to reflect real-world emissions with real-world fuel.
- Current analysis of commercially available biodiesel fuels does not indicate any concerns with fuel contaminants that would harm or degrade the engine's emission control systems, which U.S. EPA agreed in part.
- Ensure manufacturers do not prohibit the use of CARB-approved commercial fuel in a statement in the manufacturer's maintenance instructions in the owner's manual nor deny warranty based on the use of such fuels

1. Use of Commercially Available (Biodiesel) Fuel (cont'd)

- **40 CFR § 1036.415(c)(1)**
  - "… You may use any commercially available biodiesel fuel blend that meets the specifications for American Society for Testing and Materials (ASTM) D975 or ASTM D7467 (incorporated by reference in § 1036.810) that is either expressly allowed or not otherwise indicated as an unacceptable fuel in the vehicle's owner or operator manual or in the engine manufacturer's published fuel recommendations. …"



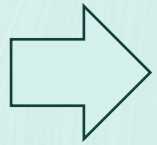
- **Part 86 II. Subpart T. 86.1910.A.2.2(ii)**
  - "For 2024 and subsequent model year engines, you may use any commercially available biodiesel fuel blend."
- **Part 86 II. Subpart T. 86.1910.A.2.3(ii)**
  - "… you may drain a prospective test vehicle's fuel tank(s) and refill the tank(s) with diesel fuel conforming to ASTM D 975 specifications or commercially available biodiesel …"

2. Compliance Determination Criteria Based on the Number of Pass/Fail Tests

- When two or more engines do not comply fully with the off-cycle bin standards, U.S. EPA CTP requires ten engines to be tested.
- When ten engines are tested, the compliance determination per U.S. EPA CTP is based on the arithmetic mean of the bin emissions from the ten engine tests for each pollutant.
- CARB's proposal will add the following criteria: if three or more engines do not comply the off-cycle bin standards for the same pollutant and same bin, the tested engine family is non-compliant.
- This would protect against outlier data points pulling the average down.

2. Compliance Determination Criteria Based on the Number of Pass/Fail Tests (cont'd)

- **40 CFR § 1036.425 Pass criteria for engine families**
  - "(c) If two or more engines tested … do not comply fully with the off-cycle bin standards, test additional engines until you have tested a total of ten engines. Calculate the arithmetic mean of the bin emissions from the ten engine tests … for each pollutant. If the mean values are at or below the off-cycle bin standards, the engine family passes. If the mean value for any pollutant is above an off-cycle bin standard, the engine family fails."



- **PART 86 II. Subpart T. 86.1915.B.3**
  - "… the engine family is deemed to be noncompliant if the Phase 1 testing meets any of the following criteria:"
- PART 86 II. Subpart T. 86.1915.B.3.1
  - "The sum-over-sum emissions of the same pollutant and same bin exceed the in-use threshold (86.1370.B.6) for three or more tests."
- PART 86 II. Subpart T. 86.1915.B.3.2
  - "Any of the average SOS values exceed the applicable in-use emission threshold defined in (86.1370.B.6.) The average SOS value is calculated from the arithmetic mean of 10 vehicles from Phase 1 testing for each of pollutants (NMHC, CO, NOx, and PM) and for each of the bins …"

3. Use of PEMS or Chassis Dynamometer for IUC Testing for Idling Emissions

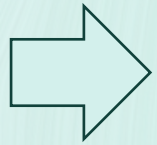
- U.S. EPA CTP requirements allow heavy-duty diesel engines to be optionally certified to the Clean Idle oxides of nitrogen (NOx) emission standards (30.0 grams/hour (g/h) for model years 2024 through 2026, and 10.0 g/h for model year 2027 and later).

- U.S. EPA CTP test procedures are based on engine dynamometer testing.

- CARB's proposal would add the provision to allow uses of PEMS or chassis dynamometer for IUC testing for the idling emissions.

3. Use of PEMS or Chassis Dynamometer for IUC Testing for Idling Emissions (cont'd)

- **40 CFR § 1036.525 Clean Idle Test**
  - "Measure emissions using the procedures described in this section to determine whether engines and hybrid powertrains meet the clean idle emission standards …"



- **PART 86 II. Subpart N. 86.1370.B.7 In-Use Compliance Testing for Idling Emissions**
  - "… the Executive Officer may conduct in-use compliance emissions testing to determine whether the engine complies with the idling NOx emission standard to which the engine is certified. The Executive Officer may follow the following procedure specified in this subparagraph 7 to determine compliance:"
- PART 86 II. Subpart N. 86.1370.B.7.1
  - "In-use compliance emission testing may be conducted using chassis dynamometer in the laboratory or using an on-board PEMS."