

Appendix A: Major differences between the California Phase 1 and Phase 2 Regulation

1. Deemed-to-comply is not an option to certify Phase 2 engines, vehicles, and trailers

Unlike the Phase 1 regulation, the “deemed to comply” option is not available for the Phase 2 regulation. Manufacturers must submit all required certification materials to CARB staff to demonstrate compliance with California requirements.

2. Trailers will be certified on a voluntary basis for MY 2020 and 2021

Trailers were not regulated in Phase 1. CARB will voluntarily certify 2020 and 2021 MY trailers under the Phase 2 regulation, as California is not enforcing the trailer standards of the CA Phase 2 GHG regulation for trailers manufactured before January 1, 2022. The applicable trailer types are box-type trailers (dry van and refrigerated trailers), flat bed trailers, tank trailers, and container chassis.

3. Glider vehicles, glider engines, and glider kits are regulated for the first time

Glider engines, glider vehicles, and glider kits are not subject to the Phase 1 standard. For Phase 2, glider vehicles (including vehicles produced from glider kits) are required to meet the vocational vehicle and tractor primary standards.

4. Small manufacturers are subject to Phase 2

Unlike for Phase 1, small manufacturers (as defined in 40 CFR 1036.801 and 40 CFR 1037.801) of heavy-duty engines, medium-duty vehicles, vocational vehicles, and tractors are subject to Phase 2 regulations from MY 2022. Small manufacturers of engines or vehicles that run on fuels other than gasoline, E85, or diesel may delay complying with GHG standard by an additional year (i.e. until MY 2023).

5. Custom Chassis provision

The Phase 2 regulation provides an option for manufacturers of vocational vehicles defined as custom chassis vehicles (motor homes, refuse haulers, concrete mixers, mixed-use vehicles, emergency vehicles, school buses, coach buses and other buses) to certify to the Phase 2 Custom Chassis Standards. The Other bus standard may not be used to certify a GHG Urban bus unless the additional requirements listed in section 1037.241 and 1037.701 of the HDV Test Procedures are met.

6. Change in the GHG useful life of Light Heavy-Duty Engines and Vehicles

For Phase 2, the GHG useful life of Light Heavy-Duty Engines and Vehicles is increased from 10 years (or 110,000 miles) to 15 years (or 150,000 miles).

7. Air Conditioning (AC) Leakage Standard

Only tractors and medium-duty vehicles are subject to the Phase 1 AC leakage standards. The Phase 2 rule extends the leakage standards to vocational vehicles also, thereby covering all vehicles for which the Phase 2 tailpipe CO₂ emission standards apply.

8. Additional requirements for meeting the AC leakage standard

Under the new Phase 2 regulations, vehicle manufacturers (except manufacturers of vehicles with air conditioning systems that use a low global warming potential (GWP) refrigerant of 150 or less) are required to provide detailed AC system information to support the AC leakage standard. The additional documents are:

- a. 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
- b. AC system schematics to show the topological layout of the system components
- c. SAE J2727 spreadsheets to show the system component specifications and system leak rate calculation

9. Vocational vehicle and tractor standards

- a. Unlike Phase 1 where the vocational vehicle standard is only based on the gross vehicle weight rating (GVWR), for Phase 2, the CO₂ standard depends on GVWR, engine cycle, and duty cycle (Urban, Multi-Purpose or Regional).
- b. For tractors, a new subcategory, heavy-haul tractors, is introduced for Phase 2.

10. Engine and powertrain fuel map

Engine manufactures must provide engine maps at time of certification, whereas hybrid manufacturers must submit powertrain maps.

11. Low GWP credit provisions for Low Global Warming Potential Refrigerants

Low-GWP refrigerant credits are available to vehicle manufacturers that use a GWP refrigerant of 150 or less in their AC system in addition to meeting the AC leakage standard.

12. Inclusion of engines installed in vehicles in annual production report

Manufacturers are required to submit annual production reports after certification. These reports must include the certified engine family name(s) that is/are installed in the certified vehicles.

13. Advanced Technology Credit Multipliers

The Phase 2 regulation established new credit adjustment protocols for vehicles certified with advanced technology. This provides advanced technology credit (ATC) multipliers of 3.5 for Plug-In Hybrid Electric Vehicles, 4.5 for all-electric vehicles and 5.5 for fuel cell vehicles. The ATC multiplier for PHEVs is applicable only if the manufacturer demonstrates that there is no increase in NOx emissions compared to an equivalent conventional vehicle, and if the vehicle meets the required all-electric range (AER) requirement.

14. Additional label requirement (ECI)

The emission control labels of vocational vehicles and tractors must include all the applicable emission control identifiers listed in section 1037.135 of the HDV Test Procedures.

15. Delegated assembly report included in certification documents

Vehicle manufacturers that rely on secondary manufacturers to install certain technologies or components on their vehicles are required to submit a report that details the delegated assembly procedure and installation instructions that are required to bring the vehicle into its certified configuration.

16. Separate California Credit Tracking

California has a separate credit system that tracks credits generated from using low GWP refrigerants, plug-in hybrid electric vehicles (PHEV) with the minimum all-electric range (AER) and no NOx increase, and low-emitting transit buses.

17. Selective Enforcement Audit

For Phase 2, certified engines, medium-duty vehicles, vocational vehicles, tractors, and trailers are subject to selective enforcement audits.

18. Infrequent Regeneration Events is accounted for in Phase 2

Unlike Phase 1, engines with aftertreatment systems that undergo infrequent regeneration events should apply infrequent regeneration adjustment factors (IRAFs) for CO₂ emissions. This is optional for N₂O and CH₄.

19. Changes to the GEM Model

In contrast to the Phase 1 GEM, which allows a limited number user defined inputs, the Phase 2 GEM requires more inputs files (for example, engine fuel maps, transmission data, and rear axle efficiency data). The Phase 2 GEM also provides users the option to account for technology improvements, such as neutral idle, intelligent controls, and tire pressure systems.