

**PUBLIC WORKSHOP TO DISCUSS PROPOSED
MODIFICATIONS TO THE LEV III CRITERIA
POLLUTANT REQUIREMENTS FOR LIGHT- AND
MEDIUM-DUTY VEHICLES AND TO THE HYBRID
ELECTRIC VEHICLE TEST PROCEDURES**



CALIFORNIA AIR RESOURCES BOARD

**MAY 30, 2014
EL MONTE, CALIFORNIA**

Further Alignment with Tier 3 Program



ARB Comment letter on Tier 3 NPRM

June 26, 2013

“It is our intent to evaluate the Tier 3 rule once it is finalized to determine where it is appropriate to further align the LEV III regulations with the federal rule, without sacrificing the stringency and emission benefits of the LEV III program.”

Agenda



- **Further alignment with Tier 3**
 - LEV III criteria FTP emission requirements
 - LEV III criteria SFTP emission requirements
 - Tier 3 exhaust testing requirements
 - ✦ Part 1066
 - LEV III evaporative emission requirements
- **Modifications to certification gasoline specifications**
- **Environmental Performance Label**
- **Reporting Requirements**
- **Hybrid Test Procedures**
- **Future OBD Changes**

Proposed Changes to the LEV III Criteria FTP Emission Requirements



- Align with Tier 3 SVM requirements
- Medium-Duty Vehicles
 - Provide a MDV fleet average compliance option
 - ✦ Work with industry to establish VEC to NMOG+NOx credit factor
 - NOx cap for LEV395, ULEV340, LEV630 and ULEV570
 - ✦ Sunset these standards in 2022
- Other changes
 - Reciprocity with federal Tier 3 gasoline and E85 certification fuel
 - Treat Bins 110 and 85 as cleaner federal vehicles when compared to LEV II vehicles
 - Align with Tier 3 20°F test requirements
 - Clarify that 50°F standards apply at 4,000 miles
 - Align with Tier 3 high altitude requirements

Tier 3 FTP Provisions We Are Not Adopting



- 50 state fleet average compliance
- Temporary extension of credit life from 5 to 8 years
- Tier 3 100% phase-in to 3 mg/mi PM standards in 2022
 - California 100% phase-in 2021 – no change
- E0/120K UL for LEV395/630 and ULEV340/570 MDVs through 2021
 - LEV III requires E10/150K UL – no change
- Tier 3 interim in-use standards applicable through 2021
 - California first 2 years of vehicle production – no change

LEV III SFTP Criteria Pollutant Exhaust Emissions



- **US06 PM Standards**

Model Year	US06 (mg/mi)	In-Use (mg/mi)	Phase-in %
2017	6	10	10
2018	6	10	20
2019	6	10	40
2020	6	10	70
2021+	6	6	100

- ARB and EPA test data show most PFI and some GDI vehicles already meet 6 mg/mi
- Phase-in allows time for further GDI development
- Considering other options which ensure progress
- **Aligning with other Tier 3 SFTP requirements that will have no negative emission impact**

Alignment With Tier 3 Exhaust Testing Requirements Part 1066



- **California test procedures extensively reference the Code of Federal Regulations (CFR)**
- **Tier 3 has restructured the CFR exhaust test procedures**
 - Migrated test procedure requirements from Part 86 to Part 1066
 - Phase-in of 1066 consistent with Tier 3 requirements
- **ARB is incorporating Tier 3 test procedure revisions consistent with the federal phase-in requirements**

Modifications to California Certification Gasoline Specifications



- California certification fuel specifications designed to mirror commercial gasoline on which vehicles operate
- Meeting current specifications for ethanol and oxygen content is problematic
 - Ethanol 9.8-10.2 vol. %
 - Oxygen 3.3-3.7 wt. %
- Propose revising the ethanol specification to provide more overlap between the ethanol and oxygen content
 - Ethanol 9.6-10.0 vol. %

LEV III Fuel Evaporative Emissions



- Align on leak test standard and test procedure
 - Standard set at OBD II evaporative leak check threshold (0.020")
 - Ensures in-use emission control
 - Quickly checks for gross-emitters
 - Increased in-use test sampling
 - Two options for testing:
 - ✦ OBD II system check: verify previous pass or force a new check
 - ✦ Off-board leak tester

LEV III Fuel Evaporative Emissions



- Align on useful life requirement for canister bleed emission standard
 - 150,000 mile/15 years
- Extend ORVR applicability to vehicles over 14,000 lbs. GVWR
- Other small “detail level” changes which don’t reduce stringency

Environmental Performance Label



- Environmental Performance Label requirements can be met by affixing the Federal Fuel Economy and Environment Label
- Updated ratings include LEV III standards and are consistent with federal ratings
- The goal is provide consumers with consistent information to help find the cleanest cars
- DriveClean.ca.gov uses federal ratings

Reporting Requirements



- **Hydrogen Fuel-Cell Vehicles (FCEVs)**
 - Per AB-8, CARB is required to work with the CEC in the planning and funding for hydrogen infrastructure
 - Data is critical for strategic infrastructure planning, and strategic infrastructure development is critical for successful OEM launch
 - CARB has been surveying OEMs on FCEVs production plans for the past several years
 - Current test procedures require OEMs to submit FCEV production plans
 - Proposed Changes in this revision include:
 - ✦ Changing Air Basin Reporting to County Reporting
 - ✦ Adds technical information about H₂ tanks (capacity, pressure, etc.)
 - ✦ Adds vehicle type (compact, midsized, cross-utility, etc.)

Reporting Requirements (continued)



- **Battery Electric Vehicle & Plug-In Hybrid Vehicles**
 - As reauthorized under AB-8, CARB participates in CVRP
 - CVRP offers financial incentives to consumers which assists OEMs in meeting ZEV targets
 - Data from OEMs on projected sales are critical for CVRP planning
 - CVRP planning which helps sustainability of program
 - Proposed changes included in this revision include:
 - ✦ Increases reporting period to 33 months to match FCEV reporting
 - ✦ Adds reporting on battery capacity, charger size, and range

Hybrid Test Procedures



- Test procedures streamlining and simplification
 - Alternative Urban Charge-Depleting Exhaust Test
 - Hwy & SFTP End-of-Test Options
 - ✦ For these test cycles, HEV & PHEV now have same CS testing
- Improved harmonization with CFR 1066 and SAE J1711
- ARB's in-house testing program of six plug-in hybrid electric vehicles to evaluate the proposed hybrid electric vehicle test procedure amendments.

Alternative Urban Charge-Depleting Exhaust Test



- PHEV with significant all-electric range (AER) required to drive through e-miles before measuring exhaust
- Alternative Urban CD Exhaust Test
 - Qualifying PHEVs allowed to separate All-Electric Range Test (AERT) from exhaust test
 - ✦ Qualifier: $\text{AER} / \text{Equivalent AER ratio} > 0.95$
- PHEVs that are driver sensitive and rely on engine assist to meet demand during all-electric operation will continue testing with existing procedure
 - These PHEVs have higher EAER
 - During AERT, any exhaust emissions that may be produced must be monitored and measured

Hwy and SFTP End-of-Test Options



- **Cold Hwy Test Deleted**
- **To end Hwy and SFTP (US06 & SC03) Tests**
 - Three attempts to meet SOC Criterion
 - If fail to meet after three attempts, option to average the three attempts and end testing
- **Alternative: A single Hwy or SFTP cycle that results in a higher SOC at the end-of-cycle relative to the start-of-cycle may be submitted as a valid test**
 - No SOC Criterion
 - No upper limit to the SOC increase

Alternative Urban Charge-Depleting Exhaust Test PHEV Research Test Data: Vehicle 1



NMOG (g/mi)	NO_x (g/mi)	CO₂ (g/mi)	Engine Start Time (sec)
0.0055	0.0047	166.29	0
0.0063	0.0048	157.75	23
0.0086	0.0028	156.14	<23
0.0057	0.0039	159.52	23
0.0086	0.0068	161.19	21

Alternative Urban Charge-Depleting Exhaust Test PHEV Research Test Data: Vehicle 2



NMOG (g/mi)	NO_x (g/mi)	CO₂ (g/mi)	Engine Start Time (sec)
0.0046	0.0062	169.89	27
0.0043	0.0063	176.96	29
0.0042	0.0066	182.18	27
0.0051	0.0068	196.44	23
0.1741	0.0044	191.45	27
0.0041	0.0072	188.04	22

Future OBD Changes



- Update to OBDII regulation (13 CCR §1968.2) planned for first quarter 2015
- Revisions to include:
 - Addition of LEVIII thresholds
 - Update to DOR credits
 - Update to hybrid vehicle requirements
 - Alignment with EPA leak test demonstration requirements
 - Alignment with EPA SVM compliance dates for leak test mileage recording and demonstration testing
 - Miscellaneous clean-up and clarification of requirements
- Actively working with industry in this process

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