

### **LEV III – Recommended Regulatory Changes**

1. **US06 PM Interim In-Use:** The current LEV III regulations contain US06 PM standards of 10 milligrams per mile (mg/mi) for vehicles under 6,000 pounds GVWR and 20 mg/mi for vehicles over 6,000 pounds GVWR. These requirements are phased in starting in the 2017 MY. Tier 3 has the same phase in, but EPA staff discovered errors in their US06 PM test program (the EPA US06 test program was used to set the LEV III US06 standards), they adopted the following US06 standards:

Tier 3 US06 PM Standards		
Model Year	US06 (mg/mi)	In-Use (mg/mi)
2017	10	10
2018	10	10
2019	6	10
2020	6	10
2021	6	10
2022	6	10
2023	6	10
2024+	6	6

The LEV III 2-Sep-2014 Initial Statement of Reason (ISOR) reports that ARB intends to harmonize with the Tier 3 requirements and add an anti-backsliding provision. We support ARB staff's intent. However, the proposed regulatory changes to implement the harmonization inadvertently contain a number of errors specific to the in-use standards noted above. ARB Staff recognized the errors and plans to propose appropriate changes to harmonize with EPA with the exception of the anti-backsliding provision.

***We recommend harmonizing with the Tier 3 in-use requirements.***

2. **IUVP high mileage vehicle:** EPA and ARB both have in-use verification program (IUVP) requirements, whereby manufacturers obtain and test a specified number of customer vehicles with low mileage and high mileage. High mileage vehicles are required to be tested within a one year period, which begins four years after the end of production, and have a minimum of 50,000 miles for each test vehicle. Manufacturers are also required to test one high mileage vehicle, which has accumulated at least 75% of the useful life mileage. Obtaining a vehicle with over 105,000 miles in the relatively short time after production is difficult. By limiting the number of vehicles required to have 105,000 miles, the results of the test program can be expedited by focusing on in-use vehicles that have accumulated mileage at a typical or normal rate.

In reviewing the LEV III requirements, there appears to be a disconnect between the IUVP testing requirements for Tier 3 and LEV III. Tier 3 continues to require only one vehicle to have the extra high mileage, while LEV III would require all high mileage test vehicles to have extended mileage accumulation, which would be very difficult or near impossible to achieve

within the required four to five year period after the end of production. In short, the current differences in the high mileage testing for IUVP are:

- a. LEV III: All test vehicles must have a minimum age and odometer mileage of 105,000 miles.
- b. Tier 3: At least one vehicle of each test group must have a minimum odometer mileage of 105,000 miles or 75 percent of the full useful life mileage, whichever is less.

We recommend harmonizing LEV III with Tier 3. The following shows the LEV III and Tier 3 regulations:

<ARB requirement>

***CALIFORNIA 2015 AND SUBSEQUENT MODEL CRITERIA POLLUTANT EXHAUST EMISSION STANDARDS AND TEST PROCEDURES AND 2017 AND SUBSEQUENT MODEL GREENHOUSE GAS EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES (last amended December 6, 2012)***

***Part I 1.1.3 High Mileage Testing.*** Amend subparagraph (c)(2) of 40 CFR §86.1845-04 to read as follows: All test vehicles certified to the emission standards in Part I, Section E.1.1.1 of these procedures must have a minimum odometer mileage of 50,000 miles. At least one vehicle of each test group certified to the emission standards in Part I, Section E.1.1.1 of these procedures must have a minimum age and odometer mileage of 75,000 for light-duty vehicles and 90,000 miles for medium-duty vehicles. All test vehicles certified to the emission standards in Part I, Section E.1.1.2 of these test procedures must have a minimum age and odometer mileage of 105,000 miles. See §86.1838-01(c)(2) for small volume manufacturer mileage requirements.

<EPA requirement>

**40 CFR Part 86. Subpart S**

*§ 86.1845-04 Manufacturer in-use verification testing requirements.*

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*(c) High-mileage testing*

*(1) Test groups. Testing must be conducted for each test group.*

*(2) Vehicle mileage. All test vehicles must have a minimum odometer mileage of 50,000 miles. At least one vehicle of each test group must have a minimum odometer mileage of 105,000 miles or 75 percent of the full useful life mileage, whichever is less.*

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*(3) Geographical limitations.*

*(i) Test groups certified to 50-state standards: For low altitude testing no more than fifty percent of the test vehicles may be procured from California. The test vehicles procured from the 49 state area must be procured from a location with a heating degree day 30 year annual average equal to or greater than 4000.*

***For IUVP, we recommend ARB harmonize the LEV III requirements for high mileage IUVP mileage accumulation with Tier 3.***

- 3. Exclusion of Extra High Mileage Vehicle from IUCP Trigger Computation:** EPA and ARB also have in-use compliance program (IUCP) requirements, which are testing conducted as a result of data obtained from IUVP testing. The vehicles tested in IUVP are tested “as received” without screening for proper maintenance. If the results from IUVP testing for a given test group exceed certain specified limits, then the manufacturer is required to run an IUCP test for that test group. The vehicles procured for IUCP testing are screened for proper maintenance.

In the current program design, the one “extra high mileage” IUVP vehicle is excluded from this IUCP “trigger” computation given there would only be one such vehicle and given it would have accumulated mileage at such an abnormally quick rate and without regard to proper maintenance. Both the EPA Tier 3 and original LEV III regulations contain this original exclusion of the extra high mileage vehicle based on the 75% trigger, but neither recognize the option of 105,000 miles, whichever is less. EPA plans to amend §86.1846-01 to read “105,000 miles or 75% of the useful life, whichever is less,” to make this requirement consistent with the changes it has made to the IUVP extra high mileage provision in its upcoming Tier 3 correction/amendment rulemaking.

The proposed amendments to the LEV III program do not address this IUCP trigger requirement. ARB currently references §86.1846-01 in the “California 2015 And Subsequent Model Criteria Pollutant Exhaust Emission Standards And Test Procedures And 2017 And Subsequent Model Greenhouse Gas Exhaust Emission Standards And Test

Procedures For Passenger Cars, Light-Duty Trucks, And Medium-Duty Vehicles (last amended December 6, 2012),” and this reference will need to be amended once EPA makes its change. Hence if not amended the regulation would continue to refer only to excluding the vehicle having a minimum mileage of 75% of the useful life and would not mention the 105,000 mile limitation and would be out of alignment with EPA’s program. ***For the determination of IUCP test groups, ARB will need to amend its provisions to exclude the one extra high mileage IUCP vehicle that would have either 75 percent of full useful life mileage or 105,000 miles, whichever is lower.***

3. **LEV III Certification gasoline harmonization:**

- a. ARB allows use of Tier 3 fuel and will test on the same fuel used to certify the vehicle. For LEV II, this is clear, see 100.3.1.1 (page B-41). It’s not as clear for LEV III, (see LEV III Test Procedures 100.3.1.2, page B-41).

***We recommend repeating the language in 100.3.1.1 in 100.3.1.2, to be clear that the manufacturer can certify using either Tier 3 or LEV III fuel and the Executive Officer will conduct compliance testing using the same fuel. We recommend similar changes to light- and medium-duty testing of FFVs on E85 and testing of heavy-duty vehicles on E10, E85 and diesel.***

- b. Additionally, in both 100.3.1.1 and 100.3.1.2 (page B-41) states, “**Use of this fuel for evaporative emission testing shall be required** as specified in the ‘California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.’” (emphasis added)

***We would recommend clarifying this language. Perhaps changing “this” to “these” in the emphasized text above.***

4. **MDV VEC:**

- a. ***The draft regulations require the manufacturer to calculate both MDV VEC and MDV Fleet Average. It should only require calculation of the method being used.***
- b. ***We recommend allowing manufacturers to add the 8.5-10k with the 10-14k NMOG+NOx credits for the MDV Fleet Average purposes. This is consistent with the allowance for LDV, consistent with EPA Tier 3 regulations for MDV, and consistent with ARB regulations for MDV VEC which effectively treat 8.5-14k as one category. This flexibility is especially important for the MDV category which has***

***limited volume and few test groups compared to light-duty. And this flexibility would have no adverse environmental impact.***

5. **Bin 85/110:** (See ISOR Appendix B, Section H.1.4 and H.1.4.1) When manufacturers certify a federal vehicle in California under LEV III test procedures, the vehicle must meet federal FTP exhaust and cold CO emissions, but must meet the California requirements as noted below.

1.4.1 Except as noted in H.1.4.1.1 and H.1.4.1.2, if a federally-certified vehicle model is certified in California in accordance with subparagraph 1.4, the model shall be subject to the federal requirements for FTP exhaust emissions and cold CO emissions. The vehicle model shall be subject to all other California requirements including evaporative emissions, OBD II, SFTP emissions, 50°F exhaust emissions, highway NMOG+NOx emissions, greenhouse gas emissions, and emissions warranty.

The ISOR Appendix B, Section H.1.4.1.1, provides a clear exemption for the 50°F exhaust emission requirements for Tier 2 Bins 3, 4 and 8 and Tier 3 transitional Bins 85 and 110. However, several of the LEV III requirements listed above are 150,000-mile durability requirements (e.g., SFTP). Vehicles certified to federal Bins 3, 4, 8, 85, and 110 will be certified to 120,000-mile durability. We understand these federal vehicles certified in California would not be considered LEV III and thus would not be required to meet the 150,000-mile durability.

1.4.1.1 A vehicle certified to federal Tier II emission Bin 3, or Bin 4, or Bin 8 or to federal Tier III emission Bin 85 or Bin 110 is not required to meet California 50°F exhaust emissions requirements.

**Recommendation:**

1. ***We recommend explicitly stating that these vehicles will be certified to 120k (FTP, SFTP, and highway NOx/NMOG+NOx). Alternatively, ARB Staff could make their intent clear in the Final Statement of Reasons.***
  2. ***Additionally, it is not clear in the requirements how these vehicles should be labeled on the emission certification label. We would like to confirm our understanding that ARB will certify these vehicles as “Federal Bin 85 [110, 3, 4, etc.]” in the EO, and the label should follow this.***
6. **MDV Categories:** For LEV395/630, ULEV 340/570, LEV III requires E10 and 150k durability with combined NMOG+NOx. Even though Tier 3 generally requires E10 and 150k in 2020MY

(like LEV III), Tier 3 allows E0 and 120K for these particular standards through 2021MY because these standards sunset at the end of the 2021 MY. This allows manufacturers to certify using carry-over data for these standards since they are going away rather than requiring new certification data for just a year or two. The standard is combined but the EDV must meet the NOx standard specified in Table 5.

***We recommend harmonizing with Tier 3 by allowing E0 and 120k just for these particular MDV standards through 2021 MY.***

7. **Cold CO:** If referencing EPA regulations, also reference the Tier 3 applicability (Tier 3 only applies to gasoline fueled vehicles – exempts E85). LEV III exempts diesel, but is silent on E85.

Amend subparagraph 86.201-94(a) as follows: This subpart describes procedures for determining the cold temperature carbon monoxide (CO) emissions from 2015 ~~and later through~~ 2021 model year new passenger cars, light-duty trucks, and medium-duty vehicles (excluding natural gas, diesel-fueled, and zero-emission vehicles).

***We recommend harmonizing with the Tier 3 requirements explicitly exempting FFVs from cold CO testing on E85.***

8. **PM Phase-in with LEV III:** The LEV III regulations require full LEV III certification (E10 fuel and 150,000-mile durability) for any vehicle used to meet the 3 mg/mile PM phase in percentage requirements. Tier 3 allows “interim Tier 3 vehicles” (those certified on E0 with 120,000-mile durability) to count toward the PM phase in. Regardless of the PM phase in, all vehicles must meet all of the LEV III requirements by 2020.

***We recommend harmonizing with Tier 3 by allowing LEV II certified vehicles to meet PM Standard.***

9. **SFTP Test Weight:** The LEV II Supplement Federal Test Procedure (SFTP) regulations require 6,001-8,500 pounds GVWR LDTs to certify at Adjusted Loaded Vehicle Weight (ALVW) rather than Loaded Vehicle Weight (LVW). Testing at ALVW rather than LVW is a temporary provision only in this specific weight class that does not apply to any other LEV II vehicles, to any LEV III vehicles, and has never applied to any federal testing.

As noted in #5 above, federal vehicles that certify in California must meet California SFTP requirements. Without a change, automakers could be required to retest a federal vehicle for the sole purpose of testing at ALVW rather than LVW. This is a significant burden to comply with a temporary requirement that doesn’t provide commensurate benefits.

***We recommend allowing federal vehicles certifying in California to be tested (for the purposes of SFTP) at LVW rather than ALVW.***

10. **High-Altitude Testing:** LEV III seems to require high-altitude testing (either California or federal). Tier 3 allows compliance based on the attestation using good engineering judgment and appropriate testing.

3.2.2 Subparagraph (c) Delete and replace with: The manufacturer must demonstrate compliance with emission standards at low-altitude conditions as described in paragraph (b) of this section. For Otto-cycle vehicles or hybrid vehicles that use Otto-cycle engines, evidence shall be supplied showing that the air/fuel metering system or secondary air injection system is capable of providing sufficient oxygen to theoretically allow enough oxidation to attain the CO emission standards at barometric pressures equivalent to those expected at altitudes ranging from sea level to an elevation of 6000 feet. For fuel injected vehicles or hybrid electric vehicles that use fuel-injected engines, compliance may be demonstrated upon a showing by the manufacturer that the fuel injection system distributes fuel based on mass air flow, rather than volume flow, and is therefore self-compensating. All submitted test proposals will be evaluated on their acceptability by the Executive Officer. As an alternative to the demonstration described above, a manufacturer may demonstrate compliance by testing California vehicle configurations as part of its federal high altitude certification requirements. Engine families that meet all the applicable California low altitude emission standards when tested at the EPA test elevation are deemed to be in compliance. The SFTP standards do not apply to testing at high altitude.

***We recommend harmonizing the LEV III requirements with Tier 3. (This might be the intent, but we'd recommend clarifying the wording, which was previously identical to EPA.)***

11. **50°F Standards:**

- a. The regulations specify the 50°F standards are 4k standards for NMOG+NOx and formaldehyde, but CO is not mentioned. ***We recommend inserting "CO" where "NMOG+NOx and formaldehyde" is listed in §1961.2(a)(4), Page A-7.***
- b. Additionally, ***we recommend copying this paragraph into §1961 (LEV II regulations). If this cannot be accomplished based on the current regulatory package, we recommend doing so as soon as possible.***

12. **PM Phase-In – Actual vs. Projected Vehicle Sales:** The LEV III and Tier 3 regulations contain two options for complying with the PM phase-in – the Standard Path with fixed phase in percentages and an Alternative Path allowing the manufacturer to use points. Under the LEV III regulations, the Standard path is a fixed percentage based on ACTUAL SALES, while the Alternative Path is variable based on PROJECTED SALES. EPA's regulations are exactly

the opposite – PROJECTED sales for the Standard Path and ACTUAL sales for the Alternative Path. This creates a conflict between the two regulations. ARB staff reported that they could not make changes to the Standard Path in this rulemaking. Rather than aligning with EPA on the Alternative Path but remaining unaligned on the Standard path, we would prefer to maintain the current regulation.

***Consequently, we do NOT recommend any changes at this time.***

### **13. PHEV Test Procedures – Alternative Test Procedures and Correction**

- a. Alternative Test Procedure: The HEV/PHEV test procedures section is extremely complex due in part to the complexity of these vehicles. As the technology matures and continues to change we feel the ARB should assure they have regulatory flexibility to allow “alternative procedures upon Executive Officer approval”. In the current proposal (45-day version dated September 2, 2104) there are several statements under specific elements of the test procedures indicating “Alternative procedures may be used if approved in advance by the Executive Officer of the Air Resources Board”. For example, Sections G.5 and G.6 allow that, “Alternative procedures may be used if approved in advance by the Executive Officer” for PHEV Urban and Highway Emissions tests, respectively.

We feel it is important to move or add this clarifying statement in a position that it will cover the whole section and not just specific elements (for example, in the introduction to Section G). It is clearly the intent of ARB Staff to allow the mechanism of alternative procedures; this request is to centrally align the statement instead of pasting it in each specific test procedure element. Without such a catch-all statement, the ARB may be constrained to administering the test procedures as written for all of those elements of the procedures that do not provide for alternatives, even though it’s not the intent. New technologies could drive perverse test procedure situations that may violate good engineering principles and judgment.

This clarifying statement would also allow ARB staff to manage the rollout of these new test procedures on a manufacturer basis. For example, let’s assume a given product is to end its manufacture in model year 2018. This proposed clarifying statement would allow ARB Staff to approve carry-over procedures and not force the use of the new test procedures in the final year of the product’s lifecycle. Such relief is routinely allowed in other procedures.



- b. Correction: Additionally, based on the 45-day version of the PHEV test procedures (dated September 2, 2014), we are finding the text (as written) could double the number of tests required to certify. Based on subsequent discussions with ARB staff we understand that wasn't the intent, but without seeing the corrected text we are compelled to comment on this concern. The ARB staff has worked hard to streamline and focus the PHEV test procedures, which we applaud. This is a concern over the way the text can be interpreted which could require unwanted/unnecessary testing (doubling the current PHEV test burden, triple what is required for non-PHEV vehicles). In addition to doubling the number of tests, we are equally concerned with the length of time PHEV charge depleting tests require which are many multiples greater than non-PHEV vehicles. This will have an adverse impact on already constrained laboratory capabilities working on critical LEV 3/Tier 3, GHG, and ZEV implementation; hence further clarifications/corrections in the proposed regulations are necessary.

#### 14. PM Certification Testing Requirements

- a. LEV III and Tier 3 contain different methods on how to select PM test data vehicles. LEV III requires testing 25% of the "test group," while Tier 3 requires testing 25% of the "durability data group" (or "durability group"). "Test groups" and "durability groups" are not equivalent. A durability group can be comprised of multiple test groups in some situations. Use of these two different terms results in a significant alignment discrepancy. Manufacturers will be subject to additional work in order to demonstrate compliance with both agencies' programs.

By default, California's requirement to test "test groups" is expected to result in additional testing over the federal program. While it is possible that California's testing could result in adequate testing to cover the federal requirements, ARB's additional requirement that ARB can select which of the test groups must be tested could result in a disproportionate amount of tests on a couple of big durability groups but might not cover the 25% of durability groups needed for EPA's requirements.

The new PM testing requirements under LEV III and Tier 3 significantly increase the amount of PM tests that manufacturers must conduct compared to requirements under the LEV II and Tier 2 requirements. In addition, PM testing is time consuming and resource intensive, and due to its difficulty, it might increase over test void rates. We believe that EPA's durability group requirement will provide more than adequate

amounts of PM test data, while also balancing the resources necessary to conduct PM testing.

Also, it is important to keep in mind that both LEV III and Tier 3 will require significant amounts of PM testing in IUVP at both low and high mileage. The industry voiced concerns about the large amounts of testing that would be required in IUVP, but both agencies only allowed limited relief. Both programs would require 50% of all of the vehicles in each “test group” tested under IUVP to receive a PM test. Hence IUVP should give more than enough testing coverage of every test group. Testing even more vehicles as part of certification for California would add significantly to an already huge burden.

***For these reasons, we urge ARB to align with EPA’s use of “durability groups.”***

- b. PM Vehicle categories and Selection Years: In addition, ARB’s requirements in 2.3 LEV III PM Requirements regarding vehicle categories and selection years should be clarified. As written, it is not clear if PC/LDT and MDV test groups are treated separately or combined, and we would appreciate clarification in the regulations clarify how these test groups are selected.

Further, the selection year restrictions need to be clarified, because both 2-years and 3-years are included in the test procedures as follows:

*<LEV3 amendment>*

*APPENDIX B, CALIFORNIA 2015 AND SUBSEQUENT MODEL CRITERIA POLLUTANT EXHAUST EMISSION STANDARDS AND TEST PROCEDURES AND 2017 AND SUBSEQUENT MODEL GREENHOUSE GAS EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES*

*G. Procedures for Demonstration of Compliance with Emission Standards*

*2. §86.1828 Emission data vehicle selection*

*2.3 LEV III PM Requirements.*

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*2.3.2 The same test group shall not be selected in the succeeding three years unless the manufacturer produces fewer than four test groups that are certified to LEV III PM standards in section E.1.1.2.1...*

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*3. §86.1829 Durability data and emission data testing requirements; waivers.*

*3.6 LEV III PM Testing Requirements. For the 2017 and subsequent model years, a manufacturer must submit test data for test groups certifying to the LEV III PM standards in section E.1.1.2.1 according to the following table. Once a test group has been used to meet the requirements of this section G.3.6 for a model year, that same test group shall not be selected in the succeeding two model years unless the manufacturer produces fewer than four test groups that are certified to LEV III PM standards...*

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***We request that ARB clarify and align the criteria for selection year in these two sections.***