



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL VEHICLE AND FUEL EMISSIONS LABORATORY
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OFFICE OF
AIR AND RADIATION

February 22, 2010

CISD-10-04 (LDV/LDT/ICI/LIMO)

SUBJECT: 2011 Fuel Economy Label Implementation

Dear Manufacturer:

On December 27, 2006, EPA finalized regulations specifying new methods to determine the fuel economy label estimates posted on the window stickers of new cars and trucks (71 FR 77872). Beginning with the 2011 model year, these regulations in some cases require that manufacturers develop mpg estimates for fuel economy labels (window stickers) based on 5-cycle test data from FTP (city), highway, US06, SC03, and cold temperature FTP tests. These regulations also require Medium-Duty Passenger Vehicles (large SUVs and passenger vans) to have FE Labels (window stickers) for the first time beginning with the 2011 model year.

The enclosure provides manufacturers with additional guidance for the implementation of these 2011 and later model year fuel economy labeling requirements. This guidance is in response to manufacturers wanting to ensure that the new 2011 fuel economy labeling requirements will be implemented in a fair and equitable manner for all manufacturers. EPA worked with members of the Alliance of Automobile Manufacturers (AAM) and the Association of International Automobile Manufacturers (AIAM) over the past year, and has presented the general concepts outlined in the enclosure to the industry on several occasions. This additional guidance is effective immediately.

If you have questions about this letter, please contact your certification team representative or Dave Good at 734-214-4450 or by email at good.david@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Karl J. Simon".

Karl J. Simon, Director
Compliance and Innovative Strategies Division
Office of Transportation and Air Quality

Enclosure

**Enclosure to CISD-10-04
2011 Fuel Economy Label Implementation**

Definitions for Terms used in this Guidance Letter

Litmus test – The “Litmus test” is the commonly known term used to describe the criteria for determining the fuel economy label calculation method (mpg-based derived 5-cycle method or vehicle specific 5-cycle method or the modified 5-cycle method) for 2011 and later model year vehicles, as outlined in 40 CFR 600.115-08. Except for certain cases outlined below or with prior EPA approval, the tests used for the Litmus Test analyses are to be the five gasoline or diesel fuel tests submitted in the Part 1 Application to demonstrate compliance to the test group's FTP/HFET/SFTP/20F exhaust emissions standards. For example, the certification emission data vehicle for each test group is tested on all five cycles (city, highway, US06, SC03 and cold FTP) as outlined in 40 CFR 600.115-08. For vehicles within each test group, the FE label method is then determined by comparing the city/highway FE label values which were determined using the vehicle specific 5-cycle method to the FE label values determined using the mpg-based derived 5-cycle method. The Litmus Test analysis should be conducted once for each required test group after all appropriate certification data are available but before the test group's initial label is submitted, and the analysis should apply to all subsequent label calculations covered by the test group throughout the entire model year.

ADFE – ADFE means Analytically-Derived Fuel Economy as outlined in 40 CFR 600.006-08(e). ADFE is also discussed in EPA guidance letter CCD-04-06 dated March 11, 2004.

Vehicle Specific 5-cycle – The method of calculating fuel economy as outlined in the provisions of 40 CFR 600.210-08 and 600.114-08, not including paragraphs 600.114-08(b)(2) and (c)(3).

Mpg-based derived 5-cycle – The method of calculating fuel economy as outlined in the provisions of 40 CFR 600.210-08(a)(2), (a)(3), (b)(2), and (b)(3).

Modified 5-cycle or “3-cycle” – The method of calculating fuel economy as outlined in the provisions of 40 CFR 600.114-08(b)(2) and (c)(3) as applicable. The modified 5-cycle is commonly known as the “3-cycle.”

EPA Requirements

1. Manufacturers may optionally label vehicles using 5-cycle tests on any model type

Optionally performing 5-cycle tests: Manufacturers may optionally label any model type based on the vehicle specific 5-cycle method. This option is clearly outlined in the provisions of 40 CFR 600.210-08(a).

2. Data Substitution and Engine Code Equivalency

Background: Current EPA policy for fuel economy data substitution and engine code equivalency is outlined in Advisory Circular (A/C) 83A for FTP (city) and highway tests. Manufacturers have requested that the data substitution and equivalency guidance previously established for FTP and highway fuel economy data be extended to US06, SC03 and Cold FTP data.

Policy for FE Label test data: For FE Label data, manufacturers may use the data substitution and engine code equivalency policy outlined in Advisory Circular (A/C) 83A, Sections VI. D and E, for city, highway, US06, SC03 and Cold FTP tests in the same basic engine provided that the manufacturer's good engineering judgment indicates that emissions and fuel economy of the tested vehicle on the applicable city, highway, US06, SC03 and Cold FTP tests are expected to be equivalent or less fuel efficient than the fuel economy of the represented vehicle.

Policy for the Litmus test data: For the Litmus tests outlined in 40 CFR 600.115-08(d), with prior EPA approval manufacturers may use data substitution and engine code equivalency outlined in Advisory Circular (A/C) 83A for vehicles in the same basic engine. EPA does not expect to approve requests which will tend to bias the results of the Litmus test, such as cases where:

- The tested vehicle is expected to be less fuel efficient on the city or highway test than the represented vehicle; or
- The tested vehicle is expected to be more fuel efficient on the US06, SC03, or Cold FTP test than the represented vehicle.

3. Litmus Test –Cold FTP Test Requirements

Background: In some cases the certification emission-data vehicle which is tested for the Cold FTP test under Part 86 regulations, may belong to a different test group than required for the Litmus test under Part 600 regulations. This occurs because Part 86 regulations require one or sometimes two Cold FTP certification tests for each durability group, while the Part 600 regulations require a Litmus test (city, highway, US06, SC03 and Cold FTP fuel economy tests) for each test group. Both Part 86 and Part 600 regulations require the test vehicle calibration and testing parameters to be representative of production vehicles. Thus, in some cases, the Part 86 Cold FTP certification test may

be unrepresentative of production vehicle calibration and test parameters in the test group required for the Part 600 Litmus test.

Policy for the Litmus test data: In cases where the Cold FTP test vehicle is not in the same test group as the test vehicle which was tested for the FTP, highway, US06 and SC03 for the Litmus test, EPA would accept the one of the following approaches:

- With prior EPA approval, manufacturers may use data substitution as outlined in Section 2 above; or
- Manufacturers may conduct an additional Cold FTP test on a vehicle in the same test group (and with the same calibration and testing parameters) as the test vehicle used for the city, highway, US06, and SC03 tests in the Litmus test.

4. Litmus Test – Model Types Contained In Multiple Test Groups

Background: Manufacturers are required to conduct a Litmus test for each test group as outlined in the provisions of 40 CFR 600.115-08(c). Some manufacturers commonly certify the same vehicle models (with the same basic engine) in two or more test groups, e.g. a Federal Bin 5 test group and a California/177 State PZEV test group. Current EPA policy (prior to this guidance letter) is outlined in Advisory Circular 83A (page 3) and states that “For the 1986 and later model years, California emission control systems will no longer distinguish separate basic engines.” Thus, for example, it is possible that the Litmus test for the Federal test group may require vehicle models to be labeled using the vehicle-specific 5-cycle method and the Litmus test for the California test group may require manufacturers to label the same vehicle models in the California test group using a different method (e.g. the mpg-based derived 5-cycle method or the 3-cycle method). Manufacturers have requested guidance to address the FE Label methodology to use for model types contained in multiple test groups.

Policy for Model Types Contained in Several Test Groups: Manufacturers should conduct a Litmus test for each test group as required by 40 CFR 600.115-08. In cases where the Litmus test results require different FE Label methodology to be used for the same vehicle model types in two or more test groups, the manufacturers may:

- Voluntarily base FE label calculations on the vehicle specific 5-cycle method for all model types within the multiple test groups; or
- In cases where the Litmus tests for the multiple test groups allow FE labels to be based on a mix of the mpg-based derived 5-cycle and the 3-cycle, manufacturers may voluntarily use the 3-cycle for all model types within the multiple test groups; or
- Subdivide model types for each test group. Calculate FE Labels separately for vehicles in each test group, using the labeling method required by the applicable Litmus test. Note that using this method, manufacturers may, in some cases, need to use California emission control systems to distinguish separate basic engines. Also, when using this method, manufacturers will

need to provide some means of easily identifying the differences in the vehicles on the fuel economy labels (or Monroney labels) and in the Fuel Economy Guide. For example, engine descriptors such as “California emission controls” or “GVWR above 6000 lbs” may be needed.

5. Litmus Test – Use of Manufacturer Tests Instead of EPA Confirmatory Tests

Background: Manufacturers are required to conduct a Litmus test for each test group as outlined in the provisions of 40 CFR 600.115-08(c). After performing the Litmus test, manufacturers typically send an electronic test request to EPA’s Verify data base for the test vehicle used to perform the Litmus test. EPA then decides whether confirmatory testing is necessary for that test vehicle at EPA’s emission testing laboratory in Ann Arbor, Michigan. If selected for EPA confirmatory testing, the vehicle is then scheduled for EPA testing as soon possible after it can be delivered to EPA’s testing laboratory. For some manufacturers, it is common for the vehicle delivery and EPA confirmatory testing process to take 2-3 months. [Note: A Litmus test can sometimes affect FE label testing for 5-10 model types within a test group (which can be held up for 2-3 months during the confirmatory testing process).]

Manufacturers have indicated that the timing of EPA confirmatory testing is crucial to their fuel economy program and requested the ability to use manufacturer’s Litmus test results (instead of EPA confirmatory testing) to determine the FE Label methodology for vehicles in test group.

Policy for EPA Confirmatory Testing of Litmus Test Vehicles, for 2011 Model Year Only: In cases where EPA confirmatory testing is scheduled for the Litmus test vehicle, manufacturers may request EPA approval to use the manufacturer’s Litmus test data (in lieu of EPA confirmatory test data) to determine the fuel economy label methodology for all model types within a test group. Based on the provisions of 40 CFR 600.115-08(d), EPA will likely approve such requests for 2011 model year only, provided:

- The start of production for vehicles represented by the test vehicle is less than 90 days from the date when all EPA confirmatory exhaust emission testing is completed;
- There was not an excessive amount of time between the date the litmus test was completed and the date when the corresponding test request was submitted to EPA;
- The manufacturer has demonstrated acceptable correlation with EPA’s laboratory;
- The subsequent EPA confirmatory testing demonstrates compliance with applicable emission requirements (and meets applicable emission standards); and
- EPA confirmatory test data are used for the FE Label calculations (except for conditional labels which are based on the provisions of 40 CFR 600.314-08(e)).

6. Analytically Derived Fuel Economy (ADFE) Policy

Background: Current EPA policy for ADFE is outlined in the provisions of 40 CFR 600.006-08(e) and EPA guidance letter CCD-04-06 for city and highway tests only. Manufacturers have requested that the ADFE policy previously established for FTP and highway fuel economy tests be extended to US06, SC03 and Cold FTP tests.

Policy for Use of ADFE test data for FE Labels: For FE Labeling data, manufacturers may use data ADFE within the limitations and other criteria outlined in EPA guidance letter CCD-04-06 for city, highway, US06, SC03 and Cold FTP tests without prior EPA approval, provided:

- The FTP (city) criteria/coefficients provided in CCD-04-06 are used for FTP bag data, cold FTP composite/bag data, US06-city bag data, and SC03 data;
- The highway criteria/coefficients provided in CCD-04-06 are used for the highway data and the US06-highway bag data.
- If ADFE criteria/coefficients are applied for US06-city and US06-highway bag data, then the US06 composite fuel economy, if needed, may be derived by taking the city and highway phase ADFE values and applying a harmonic weighted average of actual distance traveled of each test phase.

Policy for Use of ADFE test data for the Litmus Test Data: For the Litmus tests outlined in 40 CFR 600.115-08(d), with prior EPA approval manufacturers may use ADFE data using the same city and highway criteria/coefficients as outlined above. Based on the provisions of 40 CFR 600.115-08(d), EPA does not expect to approve requests which will tend to bias the results of the Litmus test, such as cases where:

- The tested vehicle is expected to be less fuel efficient on the city or highway test than the represented vehicle; or
- The tested vehicle is expected to be more fuel efficient on the US06, SC03, or Cold FTP test than the represented vehicle.

7. Litmus Test – EPA Test Fuels or California Phase II Test Fuel

Background: Manufacturers are required to conduct a Litmus test for each test group as outlined in the provisions of 40 CFR 600.115-08(c). Gasoline vehicles may be certified using either Federal test fuel (Tier 2 Unleaded Gasoline and Federal Cold FTP Fuel) or California Phase II test fuel, ref. 40 CFR 86.113-07 and 40 CFR 86.213-11. For Federal test groups, manufacturers typically conduct certification FTP, highway, US06, SC03 and Cold FTP tests on Federal test fuels (Tier 2 Unleaded Gasoline; Federal Cold FTP fuel specs are slightly different). However for California/177 State gasoline test groups, manufacturers commonly conduct certification FTP, highway, US06 and SC03 tests on California Phase II test fuel and the Cold FTP test on Federal Cold FTP test fuel. For Phase II tests, current EPA policy allows manufacturers to use the city & highway fuel economy data of vehicles tested on California Phase II test fuel, or to optionally retest the vehicle on Federal test fuel, ref. CD-95-09, June 1, 1995.

In the 2008 FE Label rulemaking, Federal test fuels were used as the basis to develop the vehicle specific 5-cycle and mpg-based (derived) 5-cycle Fuel economy equations, ref. the 615 tests shown in the preamble to the 2008 FE Labeling final rule at 71 FR 77896-77897, December 27, 2006. For the 615 tests described in the rulemaking, the fuel economy of the Phase II tests were increased by 1.7% in order to normalized them to be equivalent to the fuel economy when using Federal test fuel.

Policy for the Test Fuel used for Litmus tests: As outlined in the preamble to the 2008 FE Label final rule, (71 FR 77895, December 27, 2006) and the provisions of 40 CFR 600.115-08, the Litmus test for each test group is required to be based on the official certification test data from all five test cycles--FTP, highway, US06, SC03, and Cold FTP. Thus, for gasoline-fueled vehicles, the test fuel for the Litmus test should be consistent with certification requirements, as follows:

- Federal test fuels are used for all 5-cycle tests (FTP, highway, US06, SC03 and Cold FTP tests); or
- California Phase II test fuel is used for all FTP, highway, US06 and SC03 tests and Federally specified test fuel is used for the Cold FTP test(s).

EPA does not intend to approve other combinations of test fuel for the Litmus test because of the potential to bias the results of the Litmus test. However, as outlined in EPA Guidance letter CD-95-09, manufacturers may optionally retest a vehicle which was tested on Phase II test fuel using Federal test fuel (and replace all Phase II test data contained in the Litmus test with Federal Test Fuel data). With prior EPA approval, manufacturers may also use data substitution approaches for test fuel differences within the limitations outlined in Section 2 above.

8. Carryover of Litmus Test Data – How to Handle Running Changes

Background: Manufacturers are required to conduct a Litmus test for each test group for each model year as outlined in the provisions of 40 CFR 600.115-08(c). Both Part 86 and Part 600 regulations require test vehicle calibrations and testing parameters to be representative of production vehicles. Thus, the Litmus test data should also be representative of production vehicles for each model year.

EPA policy for carryover of previous model year certification data is outlined in the provisions of 40 CFR 86.1839-01 and EPA Advisory Circular 17F. Carryover of previous model year certification emission data is allowed by the provisions of 40 CFR 86.1839-01 provided “the previously generated emissions data represent a worst case or equivalent level of emissions for all applicable emission constituents compared to the configuration selected for emission compliance demonstration.” In some cases, running changes will create a new “worst case” level of emissions for one or more of the FTP, highway, US06, SC03 or the cold FTP tests. Manufacturers have requested guidance regarding whether to include running change data in the Litmus test in cases where the test group is carried over from one year to the next.

Carryover of Litmus test data: Based on the provisions of 40 CFR 600.115-08(c), 40 CFR 86.1839-01, and EPA Advisory Circular 17F, manufacturers may carryover the certification data (and the corresponding Litmus test data) from one year to the next; however, applicable running change data from the previous model year should be included in the Litmus test (for running changes intended for production in the model year of the Litmus test).

9. Hybrid Vehicles SOC requirements for US06, SC03 and Cold FTP tests

Background: Current EPA state-of-charge (SOC) requirements for hybrid electric vehicles are outlined in the provisions of 40 CFR 86.1811-10(n), which incorporate by reference the CARB 2003 hybrid electric vehicle test procedures. These requirements place tolerances on the battery state-of-charge (SOC) during the FTP, highway, US06 and SC03 tests, but not the Cold FTP test. For emissions and fuel economy testing, if the battery SOC increases or decreases during the test by more than 1% of the total fuel energy used during the test, the test is invalid. Based on the provisions of 40 CFR 86.1840-01, EPA also allows manufacturers (with prior EPA approval) to artificially discharge the battery prior to the test (and begin the test with a partially or fully discharged battery). For example, beginning the test with a partially discharged battery may help the vehicle meet the SOC tolerances.

FE Label test and Litmus test data: For hybrid vehicles, EPA’s current 1% SOC criteria apply to FTP, highway, US06 and SC03 tests (but not to the Cold FTP test). Manufacturers may optionally measure SOC and may optionally apply the 1% validation criteria to Cold FTP tests.