

The background features a large, faint watermark of the U.S. Environmental Protection Agency seal. The seal is circular and contains the text "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY" around the perimeter. In the center of the seal is a stylized flower with three leaves and a central stem.

EPA/Industry Light-Duty Vehicle Compliance Meeting

May 14, 2013

Courtyard Marriot

Ann Arbor, Michigan



Workshop Presentations

- Presentations will be available on our website at:
 - <http://epa.gov/otaq/hwy.htm>



Agenda

- GHG
- CAP 2000
- Road Load
- Light-Duty Diesel SCR
- Fuel Economy Procedures
- LEV 3
- NVFEL Updates
- Q's & A's



Light-Duty GHG Credits: Early 2009-2011 & 2012

EPA/Industry Meeting

May 14, 2013



Early 2009-2011 GHG Credits

- 17 manufacturers calculated early credits
- EPA released a report in March 2013
 - <http://www.epa.gov/otaq/regs/ld-hwy/greenhouse/ld-ghg.htm>
 - Report totals do not include Hyundai and Kia because totals could be affected by ongoing EPA investigation
- More than 209 million Megagrams (metric tons) of credits were accumulated
- Values shown here do not reflect errors corrected after the report was issued; those will be reflected in subsequent reporting.
- See report for expanded detail



Early Credits: All Credit Types

TABLE 1. TOTAL REPORTED EARLY CREDITS, BY TYPE OF CREDIT

Credit Type	Credits (Mg)	Percent of Total (%)
Fleet Average	180,179,993	86.15
A/C Leakage	20,834,078	9.96
A/C Efficiency	8,136,185	3.89
Off-Cycle	5,632	<0.01
Total	209,155,888	100.00



TABLE 2. EARLY GHG CREDITS REPORTED BY MODEL YEAR AND MANUFACTURER (MG)

Manufacturer	Model Year			Total
	2009	2010	2011	
BMW	409,854	280,450	194,599	884,903
Chrysler	5,583,013	4,337,613	(2,129,654)	7,790,972
Daimler	96,467	124,120	157,685	378,272
Ford	8,252,113	7,093,702	(49,379)	15,296,436
GM	13,009,374	11,073,134	493,068	24,575,576
Honda	14,073,890	14,070,290	7,370,928	35,515,108
Mazda	1,405,721	3,201,708	875,213	5,482,642
Mitsubishi	625,166	521,776	302,394	1,449,336
Nissan	10,496,712	5,781,739	1,852,749	18,131,200
Subaru	1,620,769	2,225,296	1,909,106	5,755,171
Suzuki	448,408	329,382	98,860	876,650
Tesla		35,580	14,192	49,772
Toyota	31,325,738	34,457,797	20,322,300	86,105,835
Volkswagen	2,243,205	2,811,663	1,386,537	6,441,405
Volvo	119,583	237,398	65,629	422,610
Industry Total	89,710,013	86,581,648	32,864,227	209,155,888



Credit Reporting for 2012 Model Year

- Reports were due at the end of March 2013.
- First time reporting for some manufacturers, and first mandatory reporting for all manufacturers.
- Working through this for the first time may require some extra time; EPA has approved some extensions.
- EPA expects to issue a report summarizing the 2012 model year (and total available credits, including early credits) in September/October of 2013
- Report likely to include:
 - Summary of 2009-2011 credits
 - Credit/deficit details, by manufacturer
 - Use of “extra” credits (A/C, off-cycle), by manufacturer
 - Credit transactions, showing credits in and credits out, by manufacturer



Credit Calculation Issue: Rounding

- Round using ASTM procedures
- Round to correct number of places
 - *Subconfiguration test values*: Round CREE components (except CO₂) according to 86.1837, i.e., to one more place than the emission standard. Round CO₂ to nearest gram/mile.
 - *Intermediate calculations*: CREE is rounded to nearest 0.1 g/mi for intermediate calculations [600.206-12 (a)(2)(ii), (a)(2)(iii), (a)(3)(ii)]. If only 1 FTP and/or HFET, CREE remains rounded to nearest 1 g/mi [600.206-12 (a)(1)].
 - *Final model type combined City/Hwy CREE*: Used to determine fleet average CREE, rounded to nearest 1 g/mi [600.208-12 (b)(3)(ii)].



Credit Calculation Issue: Production Weighting

- Many steps in the calculations require weighting values by the number of vehicles produced.
- Regulations require this to be done using a “sales fraction” rounded to the nearest 0.0001 percent.
- In the interest of improved accuracy, and under our authority to allow alternate procedures that provide equal or better results, we permit use of a more standard weighting method.
- This method is used in 600.510-12 (j), and illustrated below, where $CREE_n$ are CREE values for each subconfiguration, configuration, base level, or model type (depending on the step in the calculations), and $PROD_n$ are production values for each:

$$CREE = \frac{(CREE_1 \times PROD_1) + (CREE_2 \times PROD_2) + \dots + (CREE_n \times PROD_n)}{PROD_1 + PROD_2 + \dots + PROD_n}$$



Credit Calculation Issue: A/C Credits

- Do not combine with the model type value.
 - Calculate A/C credits separately from fleet average credits
 - Do not “reduce” your model type CREE by an A/C g/mile credit value
- Calculating credits for an A/C system
 - Regulations specify that A/C g/mi credits be determined for each A/C system, then the number of units produced of each A/C system is used to calculate the total Megagrams of credits for the A/C system.
 - We will permit an alternative calculation that some manufacturers may find easier, where the A/C credits are calculated for each model type, instead of for each A/C system.
 - However, if a model type has multiple A/C systems within it, the model type should be divided into multiple records, by A/C system, for the calculation. **At no time should A/C credits from different systems be production-weighted to determine a model type credit value.**
 - If using this alternate calculation, do not round the Megagrams of A/C credits calculated at the model type level. Instead, round to the nearest Megagram only after all A/C credits for the fleet have been summed together.



Credit Calculation Issue: Footprint

- A footprint-based standard is not effective unless all unique footprints are accounted for in the calculation of the standard.
- EPA regulations and preamble text consistently state that the footprint-based standard must be derived using the target values “for each unique combination of model type and footprint value” [86.1818-12].
- Manufacturers must report to EPA each unique footprint within each model type.
 - For example, a model type available with three different wheel/tire sizes could be represented by three footprint values (to the extent that the wheels and wheel offsets result in different footprints)
 - Alternatively, manufacturers may use the worst-case footprint to represent all the combinations within a model type



Credit Calculation Issue: Other Issues

- All credits (fleet average, A/C, off-cycle) should be calculated, totaled, and reported separately for cars and trucks.
 - Required by regulations, and to your advantage.
 - Example: A deficit in one category (car or truck) may be offset using credits from a prior model year, if available. You are not forced to use credits from the current model year.
- Follow the complete set of steps of the averaging process
 - Start with test values, production-weight subconfigurations, etc. until the model type CREE value is reached.
 - Identical to how you have been doing it for CAFE, except that harmonic averaging is not used for CREE.
- Report all information required to determine credits.
 - See 86.1865(l) and 600.512-12 to ensure full reporting.
 - For example, we expect A/C leakage credits to be supported by submittal of A/C system description and calculations based on SAE J2727.



New Verify CAFE/GHG Calculation Process

- Submit CAFE/GHG data set (separately for Passenger Vehicles and Light Trucks)
- Business Rule Validation
- Submission Processing Report Notification
- Calculations Performed
- Draft Calculation Report Notification (with error messages and/or calculation results).
- Reminder to change Manufacturer CAFE/GHG Final Status Indicator to “Yes” (once all calculations errors are resolved)
- EPA Review
- Request Additional Information from manufacturer if needed (will send a message to submitter’s Verify CDX inbox)
- EPA Approval
- EPA Signs CAFE/GHG Letter
- Generation of Final CAFE/GHG Reports
- Copy of Signed CAFE/GHG Letter and Final Reports sent to manufacturer



In-Use Verification Program (IUVP) GHG Changes for 2012

EPA/Industry Meeting

May 14, 2013



In-Use GHG Standards (continued)

86.1818(d); 86.1818(f); preamble 25421-24, 25476-77

(From slide 65 from EPA Sept 23, 2010 Workshop Presentation available at <http://www.epa.gov/otaq/regs/ld-hwy/greenhouse/ld-ghg.htm>)

- In-use N₂O & CH₄ standards (full useful life only):
 - Depend on N₂O & CH₄ methodology selected for compliance in 86.1818(f):
 - If Cap standards were selected, in-use N₂O & CH₄ are the certification standards (no multiplier)
 - If N₂O & CH₄ emissions are included in the OCREE equation under 86.1818(f)(2), there are no in-use N₂O & CH₄ standards for that carline/subconfiguration.
- **For IUVP testing:**
 - Measure & report CH₄ emissions & standards on FTP, only
 - Measure & report N₂O emissions & standards on FTP when applicable
 - Don't report N₂O data unless you actually measured N₂O



In-Use Testing

86.1818(f), 86.1845(b)(5)(i) & (c)(5)(i); preamble 25474-76,


(From slide 66 from EPA Sept 23, 2010 Workshop Presentation available at <http://www.epa.gov/otaq/regs/ld-hwy/greenhouse/ld-ghg.htm>)

- In-Use Verification Program (IUVP) Requirements:
 - Manufacturers must measure and report CREE, N₂O, and CH₄ on 2012 and later IUVP vehicles
 - CREE measurement is required on **FTP and Highway** cycles, only.
 - N₂O and CH₄ measurement is required on FTP cycle only.
 - For ethanol flexible fueled vehicles, perform gasoline tests only
 - Report the calculated E85 NMOG emissions per 86.1845-04(f)(2)
 - N₂O measurement & reporting is not required until 2017 model year
 - Must measure and report Optional CREE (OCREE) emissions, if the test group was certified based on OCREE equation of 86.1818 (f)(2).
 - No IUVP threshold criteria or IUVP testing requirements



Entering IUVP data into Verify database

- EPA is making changes in the Verify database:
 - Adding 2 new Test Result/Emission Names for Combined CREE and Combined OPT-CREE
 - Adding a business rule which will only allow these values to be submitted for IUVP tests
- Until those changes are deployed:
 - Enter combined CREE/OPT-CREE result in the Test Result, CREE/OPT-CREE, Weighted result fields for Test Information (TI) data sets for the FTP and Highway tests.
 - Enter the combined CREE/OPT-CREE in-use standard in the In-use standard column.
 - As there is no bag data for a combined CREE/OPT-CREE value, enter a "place holder" value of '999' for bag data for the FTP TI
 - In the comment field of the FTP and HWY TI, enter the actual CREE or OPT-CREE value for that particular FTP or Highway test.



Heavy-Duty Class 2b/3 Vehicles – Summary of Ongoing GHG Technical Amendment

EPA/Industry Meeting

May 14, 2013



HD 2b/3 Vehicle GHG Technical Amendments

- Corrected HD GHG broad reference to LDV GHG provisions (Subpart S of 40 CFR)
- Corrected the CO₂ fleet Average Calculation Method
 - Model type method does not apply to HDV's
- Clarified in 86.1865-12 (j)(4)(i) that a HD 2b/3 final model year report is required; changed reporting requirements & due date to align with LDV GHG requirements.
- Deleted incorrect reference to 40 CFR part 86, subpart S for N₂O and CH₄ standards.
 - HDV N₂O and CH₄ standards apply to a weighted average (55% city/45% hwy).
 - LDV N₂O and CH₄ standards apply to the FTP (city) test only.
- Changed the CO₂ fleet average calculation data requirement coverage to 100% at the subconfiguration level and capped test requirement to at least 25 subconfigurations or 10% of the total, whichever is less.
 - Manufacturers can use data substitution and analytical data (ADCO₂) to supplement actual testing and carry-over test data.
- Clarified that optional certification under § 1037.104 is allowed up through Class 6 vehicles with spark-engines.

CAP 2000 Guidance Letter

EPA/Industry Meeting

May 14, 2013



CAP 2000 Guidance Letter Updates

- Background
- 2013 Updates
- Application Recommendations
- Application Requirements
- Application Review



CAP 2000 Background

- Compliance Assurance Program 2000 Final Rule effective 5/4/1999
- CAP 2000 Implementation Guidance (VPCD-99-06)
 - Application timing
 - CFEIS
 - Application Format



CAP 2013 Updates

- CFEIS references replaced with appropriate Verify references or eliminated
- New Regulations and Guidance References
 - MSAT, GHG, Tier 3
- Application Recommendations
 - Speeds application review
 - Eases data retrieval
- Application Requirements
 - Reflect newer regulation and guidance (GHG, MSAT, etc.)
 - Certification may be withheld until requirements are satisfied
- Review of Requirements
 - Required due to Industry Personnel Turnover and New/Return Stakeholders



Application Recommendations

- Freedom of Information Act Application
 - FOIA = CBI-confidential information
 - Do not rely on EPA to Redact your CBI application!
- Keep References to Minimum
 - Do not cross reference FOIA and CBI
 - Include OBD approval in CBI
 - Include OBD description
 - We accept ARB OBD approval, but still need to see OBD description (this is not optional)
 - Entire application should be historically transparent with 2 documents (CBI Common and CBI Individual)
 - Do not reference databases (obsolescence), documents may be entered into Verify but should also be in cert app.



Application Requirements

- Typical Statements In-Lieu of Testing (86.1829-01, 1810-01, and 1810-09)
 - Gasoline PM
 - High Altitude FTP, EVAP, ORVR
 - Total HC
 - Cert Short Test
 - 91 RON fuel Testing
 - Spit back
 - ILEV Refueling
 - 2 Day EVAP
 - N₂O (GHG)
- Additional Statements of Compliance (additional to In-lieu of)
 - SFTP A/F ratio (lean best torque +6%) – CFR 86.1810-01(a)(6)
 - Formaldehyde Emissions 86.1829-01(b)(1)(iii)(E)
 - Cold CO and NMHC linearity requirements 86.1809-01 and -10
 - Leak Free Exhaust 86.1844-01(d)(16)
 - General Compliance Statement 86-1844-01(d)(8), (14)



Application Requirements / Review

- GHG requirements
 - Early CO2 credit pathway 86.1867-12
 - AC component durability 86.1823-08(m)(4)
 - Small Business Administration exemption
 - GHG conditional exemption request 86.1801-12(k)
- Diesel
 - Infrequent Regeneration Adjustment Factor and method of development
 - Maintenance approvals
 - Description of Diesel Exhaust Fluid SCR system
- Test Parameters
 - RLHP/ coefficients for Every Vehicle Sub-configuration not just Emissions and Fuel Economy Data Vehicles (FOIA)
 - Method for determining Road Load Horsepower (may be CBI)
- Durability Group Description
 - Includes PM Loading (CBI of course)



Overview of Guidance Update

- Release late Spring 2013 CY
- Implementation
 - Early adoption has already started
 - Suggested practices have no required date of implementation
 - Flexibility for 2014 MY/ early 2015 MY
 - Since the guidance is mainly a reminder of the current consequences of not fulfilling current reporting requirements, there is little to implement

Road Load/Coastdown Testing

EPA/Industry Meeting

May 14, 2013



Road Load/Coastdown Testing

- EPA Audit Testing
- Cold Temperature ABC Coefficients
- Dynamometers – 2wd vs. 4wd



EPA Audit Program

- Manufacturer meetings
 - EPA met with numerous manufacturers in 2010 and 2011
 - Assess manufacturer processes
 - Coastdown testing, modeling, procedures, etc.
 - Production testing, frequency, location, etc.
- EPA began to screen manufacturer reported road load data to identify outliers or unusual data



Coastdown Audit Summary

Over the past 15 months:

- EPA has conducted five road load (coastdown) audit test trips.
- EPA used five different locations around the U.S.
- 26 vehicles were tested - with some tested multiple times.
- Audits covered 21 different models.



EPA Audit Testing

- EPA coastdown plans
 - For the 2013 CY, EPA plans to have four rounds of coastdown testing
 - EPA has completed the first round of testing
 - EPA is still determining where next rounds of testing will occur
 - EPA plans to perform 3-4 rounds of testing for the next several years



EPA Audit Testing

- EPA test procedures
 - EPA follows the test procedures described in SAE J1263 and J2263
 - EPA generally targets lower wind conditions than allowed in the SAE procedures. (<7 mph average and <10 mph peak)
 - EPA primarily tests with on-board anemometer. Except, in low wind conditions (i.e. < 5 mpg average), EPA may test with stationary anemometer.
 - The vehicles are ballasted to ETW with driver and equipment



EPA Audit Testing

- EPA test procedures (continued)
 - The vehicles are aligned prior to testing
 - The ride height and wheel drag may be measured prior to testing but will not be adjusted.
- EPA Analysis method
 - Analysis is performed using the SAE analysis software tool or by equations of force from J1263 (using the temperature and baro correction given in J1263)



Cold Temperature Road Load Coefficients

- Regulation
- Background
- EPA Evaluation
- Future Guidance



Cold Road Load Coefficient Regulation

- 86.230-94 (b)
 - Dynamometer shall be adjusted to simulate the operation of a vehicle on the road at 20F
 - Alternatively, the adjustment may be based on a 10% decrease in the target coast down time
 - Interpreted to mean a 10% increase in coefficients



Cold Temperature Coefficients, Background

- Original Guidance, CD-93-01, evaluated road load effects on CO emissions not fuel economy
- 10% adjustment was originally applied to the hydrokinetic curve



Cold Coefficients, EPA Evaluation

- SAE involvement
 - EPA working with SAEJ2264 and the light duty vehicle performance committee on establishing/verifying “adjustments”
- EPA Cold Temp Test Facility
 - EPA investigating different CD methods
 - 10% target adjustment with 20F derivation
 - Using 68-86F set coefficients without derivation
 - Effect on fuel economy as well as CO/ NMHC



Cold CO Coefficients – Future Guidance

- EPA may cite forthcoming SAEJ2264
 - Reduce testing variability
 - Level playing field
- Pending EPA study and SAE findings
 - Recommended cold test dynamometer adjustments could be updated
 - 10% option would still be available pending regulation change
 - Manufacturer could also seek approval for alternative method
 - Worse case allowances preserved



Dynamometers – 2wd vs. 4wd

- Current Practice
- EPA Evaluation
- Future Testing



Current Practice 2wd vs. 4wd

- Confirmatory testing follows manufacturer test method
- Surveillance testing on both 2wd and 4wd
- Defeat device evaluation
- Fuel economy effects
 - Regenerative braking



EPA Evaluation

- SAEJ2264 revision underway
- EPA/ Industry study on 2wd/ 4wd equivalence
 - Addressed in 1066/ Tier 3



Future Testing/ Concerns

- EPA soon able to test all cycles on 4wd dynamometer
- 2wd operation should not decrease emissions or consumption relative to normal in-use operation
 - 4wd dynamometer testing may be used confirm 2wd assumptions before 1066 is final
 - “dyno” modes may not represent normal in-use
- Driven by evaluation (previous slide)

A large, faint watermark of the U.S. Environmental Protection Agency logo is centered in the background. The logo features a stylized flower with three leaves and a circular top containing a sun-like symbol. The text "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY" is arranged in a circular path around the central emblem.

Light-Duty Diesel SCR

EPA/Industry Meeting

May 14, 2013



Light-Duty Diesel SCR

- DEF Maintenance Interval
- Urea Quality Sensors



DEF Maintenance Interval

- For the 2009 through 2014 model years, EPA has approved DEF maintenance intervals for light-duty diesel vehicles that have been equivalent with oil change intervals
- Numerous manufacturers have requested that the DEF maintenance interval be decoupled from the oil change interval
 - Use of synthetic oils allows for greater oil change intervals (15,000 – 20,000 miles)
 - Want to maximize extended oil change interval, but cannot replace DEF at same interval
 - GHG/CAFE effect - smaller, lighter vehicles with downsized engines need smaller DEF storage tanks
 - Tier 3 may require increased dosage rates
 - Robust warning and inducement systems guarantee that consumers will replace DEF
- EPA published NPRM in 2012 that proposed DEF maintenance intervals
 - Proposed oil change interval as DEF interval for light-duty
 - Auto comments suggested decoupling DEF interval from oil changes interval and recommended a minimum mileage interval of 3,000 miles



Urea Quality Sensors

- EPA concerned about potential for vehicle operators to dilute DEF in the field resulting in NO_x emissions exceeding the standards
- EPA plans to issue new guidance on testing heavy-duty diesel on-highway engines with adjusted diesel exhaust fluid (DEF)
 - Need to detect poor DEF quality well enough to avoid exceedances of the NO_x standards
 - Poor DEF quality would be considered any urea concentration at which an engine is unable to comply with the relevant NO_x standard over an applicable test cycle
 - Can use NO_x sensors or urea quality sensors



Urea Quality Sensors

- EPA/CARB plan to meet with auto manufacturers to discuss urea quality sensors for light-duty applications
 - Need for urea quality sensors
 - Feasibility of urea quality sensors
 - Should HD guidance policy apply to light-duty
 - Timing/phase-in (which model year)

A large, faint watermark of the U.S. Environmental Protection Agency logo is centered in the background. The logo features a stylized flower with three leaves and a circular top containing a sun-like symbol. The words "UNITED STATES" and "ENVIRONMENTAL PROTECTION AGENCY" are arranged in a circular path around the central emblem.

Fuel Economy Procedures

EPA/Industry Meeting

May 14, 2013



Fuel Economy Procedures

- Fuel economy concerns
- Drive trace requirements



Fuel Economy Concerns

- Fuel economy is a top concern for public, manufacturers, and EPA
- Manufacturers under pressure to provide high fuel economy performance
- Vehicle technology advancing at almost unparalleled rate
- Testing vehicles becoming more challenging
- Some regulations, procedures, policy and guidance are dated and need to be updated
- EPA is closely monitoring all of this and will address any areas that are deemed appropriate and/or necessary
- EPA would work closely with industry on any changes
- A good example of this is drive trace requirements



Drive Trace Requirements

- Why are drive trace requirements needed ?
- Early examples
- Metrics
- Tier 3 Proposal
- Verify Requirements

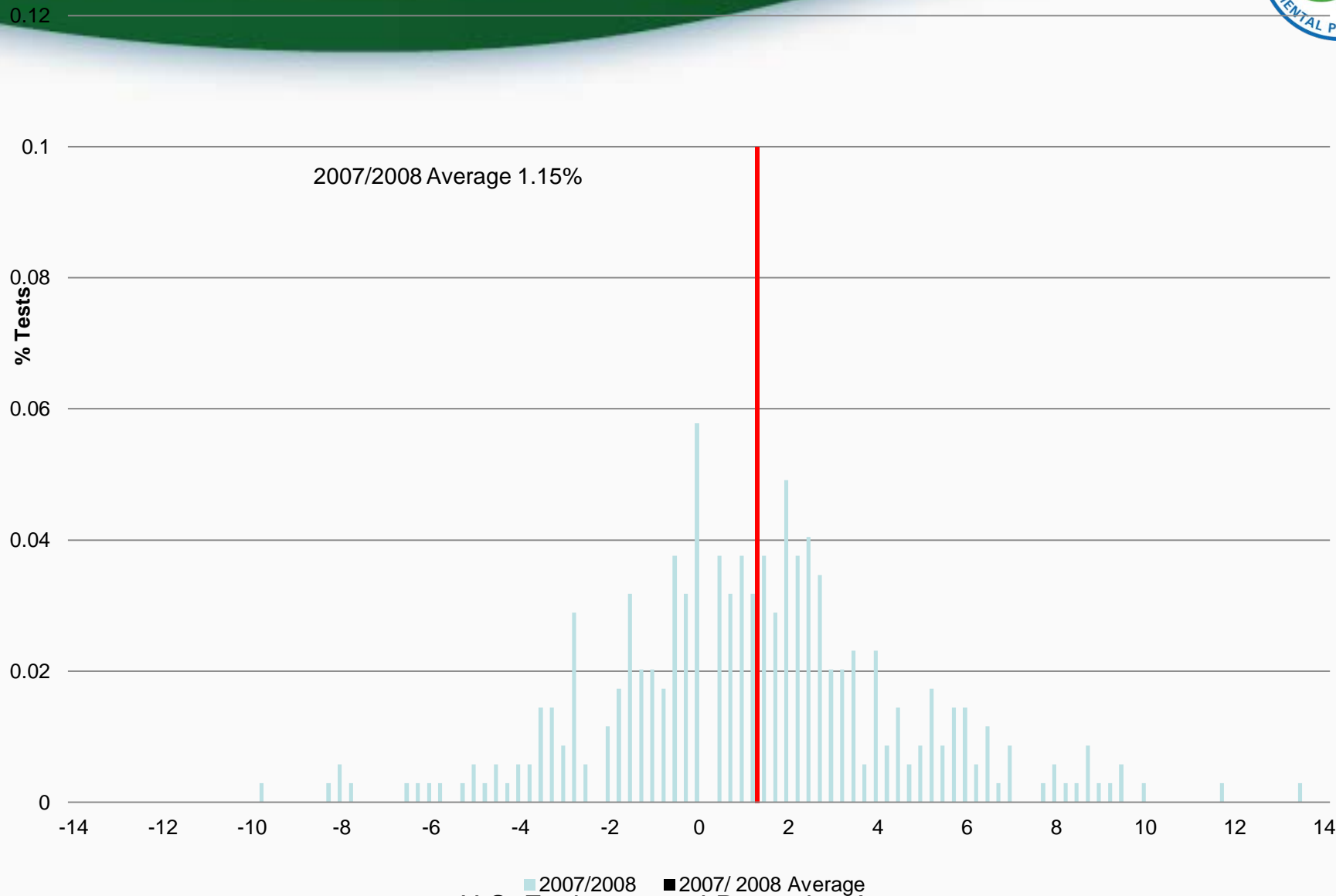


Why Drive Trace Requirements ?

- Lab to Lab correlation
 - FE retests more common
- GHG
 - Driving technique could significantly impact compliance
 - IUVP
- Fuel economy label
 - Hypersensitivity to FE claims
 - Consumers
 - OEMs
 - Media
 - Along with General Label liberties, driver technique may be largest offset between lab and “real world” FE
- New technologies are more variable with driver input



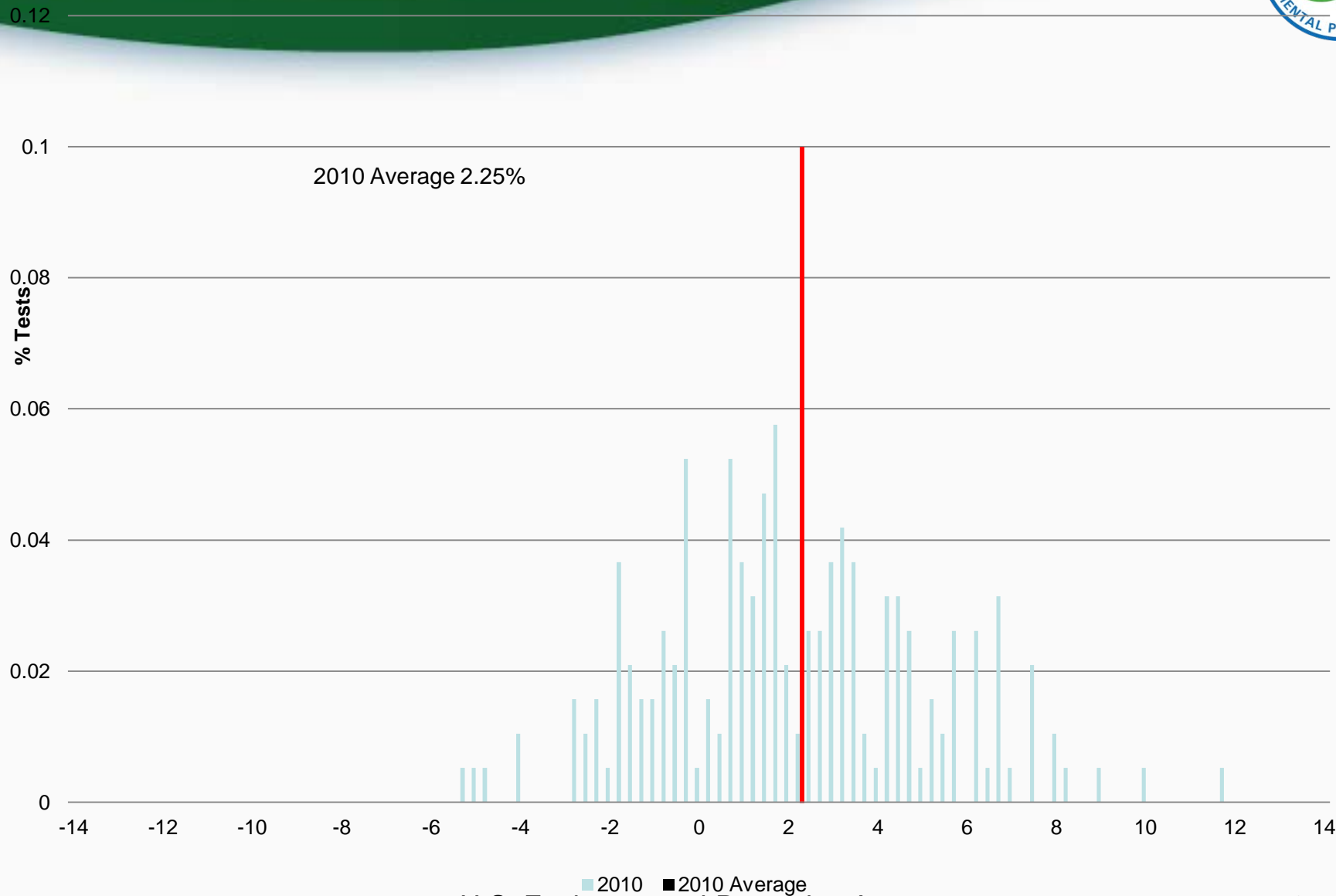
FE Offsets 2007/8



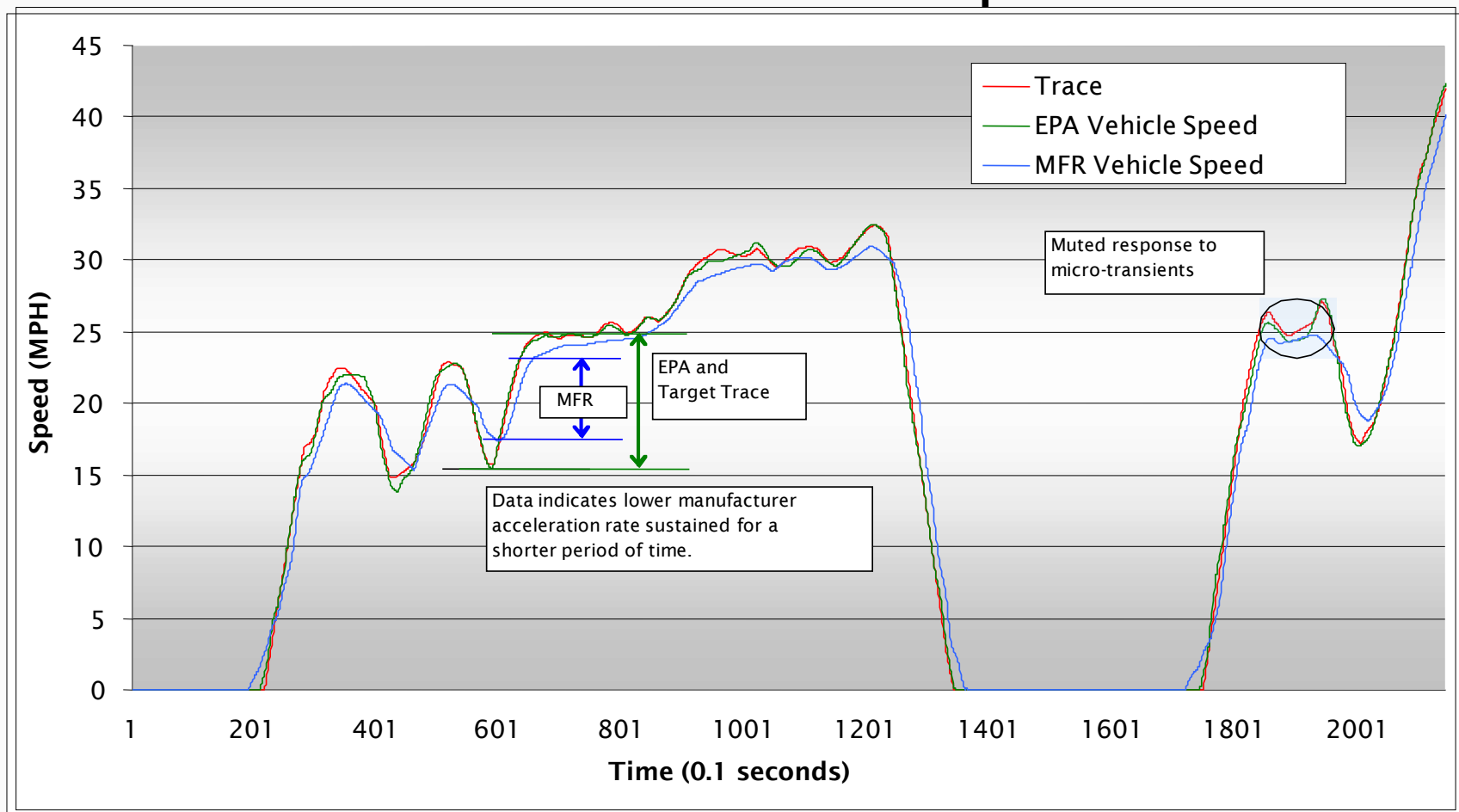
■ 2007/2008 ■ 2007/ 2008 Average
U.S. Environmental Protection Agency



FE Offsets 2010 MY



Drive Trace Example

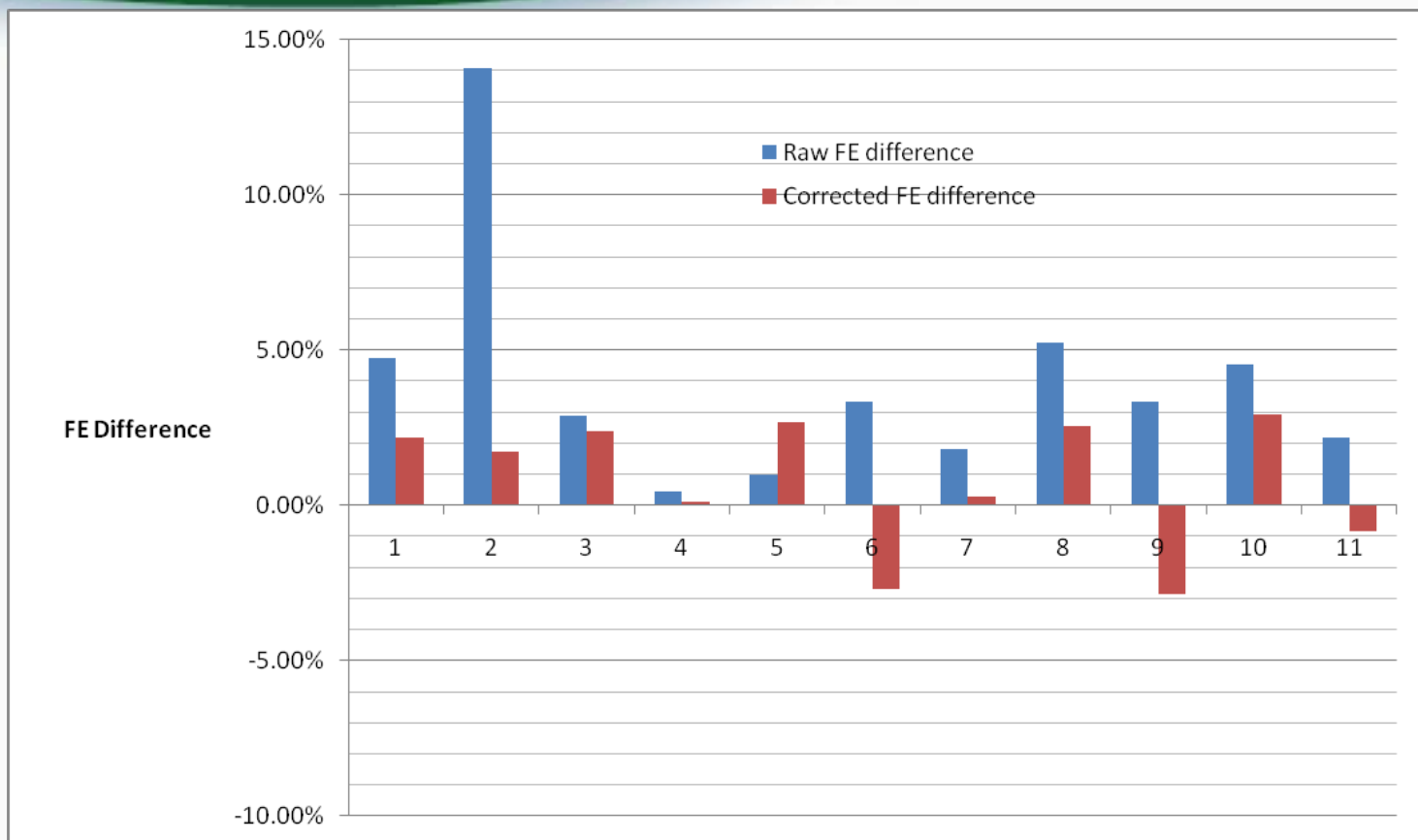




Early Drive Trace Example

Vehicle Speed Data	Average Power Requirement	Difference Compared to Target
Target trace	6.313 HP	NA
Manufacturer trace	5.752 HP	-8.89%
EPA trace	6.292 HP	-0.32%

- For this vehicle, the manufacturer offset in fuel economy was approximately 8%, comparable in magnitude to the – 8.6% difference in estimated power demand between the manufacturer and EPA
- Since this study, EPA has looked at the affect of: energy required to drive the cycle, inertia work, and absolute speed change on ftp, hwy, and US06 FE



- Fuel economy difference is between manufacturer and EPA confirmatory test
- Corrected FE is the raw Inertia Work difference subtracted from the raw FE difference



Early Study Conclusions

- Nearly all lab FE offsets that exceeded 3% were accompanied by energy offsets
- Besides inertia work, cycle energy and absolute speed change may help in predicting FE offsets
- Not enough data to set drive trace tolerances
 - FE sensitivity to driver behavior may be vehicle/technology dependent
 - Vehicle and driver capability need to be assessed



Drive Trace Metrics

- Drive related variation can significantly affect fuel economy and green house gas emissions.
- Current drive trace tolerance of +/- 2mph per second provides for significant variation in drive trace
- Need to develop drive quality metrics in order to monitor drive related variability and its effect
- SAEJ2951 - Drive Quality Evaluation for Chassis Testing
 - Opened in August, 2010
 - Phase 1 published in 2011
 - Phase 2 now open
 - Regenerative Braking
 - Driver capability



Tier 3 Driver Trace

Tier 3 NPRM includes driver trace reporting requirements

- SAEJ2951
- Metrics
 - Inertia Work Ratio Rating
 - Energy Economy Rating
 - Absolute Speed Change Rating
- Required for every driven trace, with test waiver request
- No suggested tolerance



Verify Driver Trace Requirements

- Verify will require beginning in 2015 MY (Summer 2013 release)
 - If no driver trace data is available
 - Enter 99.99
 - Driver trace request from EPA more likely
 - EPA confirmatory more likely
- “Driver Trace” document type in document module



Certification & Fuel Economy Requirements for LEV 3 Vehicles

EPA/Industry Meeting

May 14, 2013



Test Fuel for Certification and Fuel Economy Tests

- Tier 2 Certification Test Fuel:
 - Before Tier 3 regulations becomes effective:
 - For Tier 2 certification, EPA Tier 2 (E0 Indolene) or CARB Phase II test fuel must be used to demonstrate compliance with EPA Tier 2 emission standards.
 - After Tier 3 regulations becomes effective:
 - TBD based on what is adopted in the Tier 3 final rule
 - Tier 3 proposal: Beginning with 2015 model year, CARB (E10) LEV3 test fuel may be used to demonstrate compliance with EPA Tier 2 emission standards
- Fuel Economy & Greenhouse Gas (GHG) Test Fuel:
 - Currently there are no mpg or CREE equations for E10 (or E15) test fuel
 - Preamble to the Tier 3 proposal discusses:
 - Fuel economy equation for E10/E15 test fuel
 - Effect of E10/E15 test fuel on CO2
 - Indicates that both will be addressed in a future EPA rulemaking action
 - See pages 238-241 of Tier 3 proposal at <http://www.epa.gov/otaq/tier3.htm>
 - Until an mpg equation is developed, EPA Tier 2 (E0 Indolene) or CARB Phase II test fuel should be used for fuel economy & GHG testing



EPA Confirmatory Testing

- EPA intends to confirmatory test some of your LEV3 certification vehicles
 - EPA Laboratory is currently procuring LEV3 regular octane test fuel
 - We are in the process of ordering gasoline blend stock which we will blend with pure ethanol to make our own E10 LEV 3 test fuel
 - EPA should have LEV3 test fuel blended and ready to use by early-June, 2013
 - If your vehicles require LEV3 premium octane test fuel, EPA may need the manufacturer to supply a 55 gallon drum of test fuel at least 3 weeks prior to testing.
 - Contact your certification team member to arrange delivery of the premium test fuel and determine whether it is needed.
 - Note that California LEV3 regulations only allow premium octane (91 (R+M)/2 minimum) to be used for certification testing of vehicles “that require the use of premium gasoline as part of their warranty.”



EPA Verify Database Changes for LEV3

- Verify Release 11 (deployed Nov 9, 2012) added:
 - New sets of various LEV2 and LEV3 exhaust emission standards
 - 2 new evaporative emission standards
 - LEV3 Option 1 (with rig test)
 - LEV3 Option 2 (with canister bleed test)
 - [We didn't add the actual canister bleed test, yet.]
 - 2 new Test Fuel Type Codes:
 - Code 46 CARB LEV3 E10 Regular Gasoline
 - Code 47 CARB LEV3 E10 Premium Gasoline
 - 2 new Test Result/Emission Names
 - NMOG+NOX (combined NMOG + NOx emissions)
 - NMOG+NOX-COMP (SFTP composite NMOG + NOx emissions)
 - Note: We didn't add the calculation procedure for NMOG+NOx-COMP emissions yet.
 - Two new SFTP test procedures for MDVs
 - Code 16 (Hot 1435 LA92)
 - Code 96 (US06 Bag2 Only)



EPA Verify Database Changes for LEV3

- Verify's May 2013 Release (to be deployed May 31, 2013) will add:
 - The correct calculation procedure for determining (NMOG + NO_x) certification levels and pass/fail results
 - 1 new Test Fuel Type Code and 1 revised Test Fuel Type Code:
 - Add code 18 - CARB Cert Diesel 7-15 PPM Sulfur (California Ultra Low Sulfur Diesel fuel)
 - Revise code 19 from "CERT Diesel 7-15 ppm Sulfur" to "Federal Cert Diesel 7-15 PPM Sulfur" (Federal Ultra Low Sulfur Diesel fuel)



Calculation of Certification Levels for LEV3 (NMOG + NOx) emissions

- Verify's May 2013 Release will calculate (NMOG+NOx) Pass/Fail values as follows:
 1. Manufacturers enter NOx and either NMOG or NMHC test data
 2. Apply NMOG/NMHC ratio, if NMHC was measured instead of NMOG
 3. Round NMOG and NOx test data individually to one decimal place beyond the (NMOG + NOx) Standard (using ASTM Rounding)
 - Typically 0.xxxx grams per mile for both NMOG & NOx emission values
 4. Apply NMOG additive & multiplicative deterioration factors to NMOG data (unless test vehicle used aged components)
 - Don't round the result
 5. Apply NOx additive & multiplicative deterioration factors to NOx data (unless test vehicle used aged components)
 - Don't round the result
 6. Add the unrounded NMOG and NOx results from steps 4 and 5
 7. Round the combined (NMOG + NOx) results from step 6 to the same number of decimal places as the LEV3 (NMOG + NOx) standard (using ASTM rounding)



Verify May 2013 Release - Data Entry for LEV3

- Verify Test Information:
 - Enter exhaust & evaporative data normally
 - Enter separate NMOG/NMHC and NOx certification test data
 - Don't enter combined (NMOG + NOx) certification test data after Verify's May 2013 Release is deployed
- Verify Test Group:
 - Enter a certification region code of CA (California + 177 States), then
 - Enter LEV3 deterioration factors (DFs) and standards normally, except for NMOG, NOx and (NMOG+NOx) as outlined below:
 - Enter separate NMOG and NOx DFs and "dummy" standards for each applicable exhaust test procedure (e.g. test procedures 3, 21, 31, etc)
 - Enter NMOG and NOx dummy standards of 99.999
 - Be sure the dummy standard has the same number of decimal places as the (NMOG+NOx) standard so that the Verify Rounding process will be done correctly
 - Enter a combined (NMOG+NOx) standard and a "dummy" DF
 - Enter a dummy (NMOG+NOx) DF of zero--it will not be used in the calculations
 - For the Litmus test, enter Indolene (E0) or CARB Phase II data for the official FTP, Hwy, US06, SC03 and Cold CO tests
 - (for both 50-state test groups and California-only test groups)



Verify Data Entry for LEV3 (continued)

- Verify Confirmatory Test Decision (Waiver Requests):
 - Enter LEV3 exhaust & evaporative data normally
- Verify Certification Summary Information (CSI) Report:
 - Please list in the Manufacturer Test comment field the certification level and emission standard for tests which are not supported by Verify, for example:
 - SFTP Composite (NMOG + NOx) certification levels and emission standards (if applicable)
 - Evaporative canister bleed test certification level & emission standard (if applicable)
- Verify Fuel Economy Labels:
 - Must use Tier 2 Indolene (E0) or CARB Phase II data for gasoline FE Labels
 - (Verify doesn't calculate fuel economy for E10 LEV 3 tests)

A large, faint watermark of the U.S. Environmental Protection Agency logo is centered in the background. It features a stylized flower with a white center and green leaves, surrounded by the text "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY" in a circular arrangement.

EV/PHEV Testing

EPA/Industry Meeting

May 14, 2013



EV/PHEV Testing

- EV Test Procedures
- SAEJ1634 Changes
- Charging
- Label Adjustment Factors
- PHEV Test Procedures



EV Test Procedures

- Currently, 40CFR600 cites SAEJ1634 as cancelled in 2002
- Manufacturers may use alternate EV test procedures with prior approval. (FR 6/6/2011 39500 and 40CFR 600.116-12(a)(5)) This includes the new SAEJ1634



SAEJ1634 Changes

- Multi-Cycle Test
 - Can produce both City and Highway range and consumption values using one recharge event
 - dyno test time reduction
 - 150 mi range BEV approx. 75%
 - Methods could be applied to 5-cycle testing
 - Reduces drive trace time and related void rate
- “Low Powered” BEV
- Charging and Preconditioning Clarified
- Test Termination, Range
 - Simplified to “driven distance” for single cycle test
- Speed Tolerances Increased



Charging

- Charge Modes
 - Disclose all charge modes prior to testing
 - Modes may include, but are not limited to: quick charge, battery protection, voltage/ amperage options, inductive, DC, etc.
 - Default charge mode
 - If determined, default mode data used for FE label
 - Without determination, mode data may be averaged for label
- EPA service
 - 240V
 - Amperage recommended by the manufacturer
- EVSE
 - Manufacturer supplied



Label Adjustment Factors

- Derived 5-cycle
- 0.7 multiplier
- Alternative Adjustment
 - Requires EPA approval
 - Data Intensive
 - Real world
 - 5-cycle data
 - Freedom of Information Act



PHEV Test Procedures

- EPA and CARB Harmonization Efforts
 - Tier 3
 - IUVP
- IUVP – Low Mileage
 - Charge sustaining
 - Follow current HEV practices
 - Charge depleting
 - DC measurement not required
 - Alternative procedures to full CD testing may be approved
- IUVP – High Mileage
 - TBD
- IUVP Standards
 - GHG is a Full Useful Life Standard
 - Deterioration factors should account for increase in GHG emissions
 - Calculation of PHEV IUVP GHG emissions
 - TBD

A large, faint watermark of the U.S. Environmental Protection Agency logo is centered in the background. The logo consists of a circular border containing the text "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY" and a central emblem featuring a stylized flower or plant with a sun-like shape above it.

NVFEL Updates

EPA/Industry Meeting

May 14, 2013

Vehicle Testing Updates

Passenger Vehicle Testing to 14,000 lbs.

- 5 Cycle Testing
 - New 4WD SC03 Air Conditioning Site
 - New 4WD Cold Test Site
- Additional GHG in Cells
- Additional RFS in Cells
- Additional 4WD on 2 dynos (Hybrid)
- Additional Ethanol Blend Capability
- 2 PZEV SHEDs with RFS Capability





CBI – Certification and Compliance Data

EPA/Industry Meeting

May 14, 2013



CBI – Certification and Compliance Data

- CBI class determination issued in March 2013 (see CD-13-05)
 - Final determination reflects comments received from industry
 - Updates the previous determination that was issued in 1977 and only covered light-duty vehicles
 - Allows us to continue to publish same general certification data as in past
- General categories considered to be CBI
 - Small SI bond information
 - Projected sales
 - Production dates
 - Aftertreatment device details
 - AECD names/details
 - Engine technical descriptions
 - Engine family comments



Availability of Certificates / Data

- Posting of certification data on website
 - Certification data for all industries is posted every 4 months at <http://www.epa.gov/otaq/testdata.htm>
 - Data is not posted until the manufacturer-submitted “Introduction into Commerce” date has passed