ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 86 and 600

[EPA–HQ–OAR–2005–0169; FRL–8257–5]

RIN 2060–AN14

Fuel Economy Labeling of Motor Vehicles: Revisions To Improve Calculation of Fuel Economy Estimates

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is finalizing changes to the methods used to calculate the fuel economy estimates that are posted on window stickers of all new cars and light trucks sold in the United States. This final rule will greatly improve the EPA fuel economy estimates to more accurately inform consumers about the fuel economy they can expect to achieve in the real world. The new test methods take into account several important factors that affect fuel economy in the real world, but are missing from the existing fuel economy tests. Key among these factors are high speeds, aggressive accelerations and decelerations, the use of air conditioning, and operation in cold temperatures. Under the new methods, the city miles per gallon (mpg) estimates for the manufacturers of most vehicles will drop by about 12 percent on average relative to today's estimates, and city mpg estimates for some vehicles will drop by as much as 30 percent. The highway mpg estimates for most vehicles will drop on average by about 8 percent, with some estimates dropping by as much as 25 percent relative to today's estimates. These changes will take effect starting with 2008 model year vehicles, available at dealers in 2007. We also are adopting a new fuel economy label design with a new look and updated information that should be more useful to prospective car buyers. The new label features more prominent fuel cost information, an easy-to-use graphic for comparing the fuel economy of different vehicles, clearer text, and a Web site address for more information. Manufacturers will be phasing in the new design during the 2008 model year. Finally, for the first time we are requiring fuel economy labeling of certain passenger vehicles between 8,500 and 10,000 lbs gross vehicle weight rating. Because of the Department of Transportation's recent regulation that brings medium-duty passenger vehicles into the Corporate Average Fuel Economy program starting in 2011, EPA is now statutorily obligated to include these vehicles in the fuel economy labeling program. Medium-duty passenger vehicles are a subset of vehicles between 8,500 and 10,000 lbs gross vehicle weight that includes large sport utility vehicles and vans, but not pickup trucks. Vehicle manufacturers are required to post fuel economy labels on medium-duty passenger vehicles beginning with the 2011 model year.

DATES: This final rule is effective on January 26, 2007. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of January 26, 2007.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA–HQ–OAR–2005–0169. All documents in the docket are listed on the *www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, e.g., Confidential Business Information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *www.regulations.gov* or in hard copy at the Air and Radiation Docket, EPA/DC, EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Air and Radiation Docket is (202) 566–1742.

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SUPPLEMENTARY INFORMATION:

Does This Action Apply to Me?

This action affects companies that manufacture or sell new light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles.[1] Regulated categories and entities include:

Category	NAICS Codes [a]	Examples of potentially regulated entities
Industry	336111, 336112	Motor vehicle manufacturers.
Industry	81112, 811198, 54154	Commercial importers of vehicles and vehicle components.

[a] North American Industry Classification System (NAICS)

This list is not intended to be exhaustive, but rather provides a guide regarding entities likely to be regulated by this action. To determine whether particular activities may be regulated by this action, you should carefully examine the regulations. You may direct questions regarding the applicability of this action to the person listed in **FOR FURTHER INFORMATION CONTACT.**

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[1] "Light-duty vehicle," "light-duty truck," and "medium-duty passenger vehicle" are defined in 40 CFR 86.1803–01. Generally, the term "light-duty vehicle" means a passenger car, the term "light-duty truck" means a pick-up truck, sport-utility vehicle, or minivan of up to 8,500 lbs gross vehicle weight rating, and "medium-duty passenger vehicle" means a sport-utility vehicle or passenger van from 8,500 to 10,000 lbs gross vehicle weight rating. Medium-duty passenger vehicles do not include pick-up trucks.

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I. Introduction

This final rule has three key elements. First, we are finalizing changes to the Environmental Protection Agency's (EPA) fuel economy testing and calculation procedures so that the miles per gallon (mpg) estimates for passenger cars and light-duty trucks will better reflect what consumers achieve in the real-world. Second, we are updating the fuel economy window sticker that appears on all new cars and light trucks sold in the U.S., which will make the window sticker more useful and understandable to consumers. Third, for the first time we are requiring fuel economy labeling of certain passenger vehicles between 8,500 and 10,000 lbs gross vehicle weight rating (GVWR), such as the largest sport-utility vehicles (SUVs) and passenger vans.

This final rule follows a Notice of Proposed Rulemaking (NPRM) published on February 1, 2006.[2] In the NPRM, we proposed changes to the testing and calculation procedures used to calculate the fuel economy estimates that appear on window stickers that are posted on all new cars and light trucks sold in the United States. The NPRM also proposed changes to the fuel economy label design and content. We received comments on the NPRM from a wide variety of stakeholders, including the automobile manufacturing industry, environmental groups, consumer organizations, state governments, and the general public. These comments are available for public viewing in Docket EPA–HQ–OAR–2005–0169. Docket content can be viewed and/or downloaded at *http://www.regulations.gov*.[3] Our responses to these comments are detailed in the Response to Comments document, which is available in the public docket and on our Web site.[4] In this section of the final rule we describe some background information and provide a brief description of the content, timing, and rationale for the final program. For additional background and details regarding the proposal, readers should consult the NPRM and related documents.

A. Background

With this final rule, EPA is helping car buyers make more informed decisions when considering a vehicle's fuel economy. Fuel economy, or gas mileage, continues to be a major area of public interest for several reasons. Passenger vehicles account for approximately 40 percent of all U.S. oil consumption. Finally, the more miles a car gets per gallon of gasoline, the more money the owner saves on fuel costs. With consumers' renewed interest in fuel savings due to higher gasoline prices, providing mileage estimates that more closely reflect real-world driving has once again become important for consumers who comparison-shop.

The EPA fuel economy estimates have appeared on the window stickers of all new cars and light trucks since the late 1970's and are well-recognized by consumers. The window sticker displays two fuel economy estimates: One for city driving and one for highway driving. These estimates, in units of miles per gallon, essentially serve two purposes: (1) To provide consumers with a basis on which to compare the fuel economy of different vehicles, and (2) to provide consumers with a reasonable estimate of the fuel economy they can expect to achieve. While the EPA fuel economy estimates have generally been a useful tool for comparing the relative fuel economy of different vehicles, they have been less useful for predicting the fuel economy that consumers can reasonably expect to achieve in the real world. Consumers need to be provided with accurate,

[2] See 71 FR 5426 (Feb. 1, 2006), Available in the public docket and on our Web site at *http://www.epa.gov/fueleconomy/regulations.htm.*

[3] Enter the docket i.d. number (EPA–HQ–OAR–2005–0169) in the Keyword field and choose ''All Documents (Open and Closed for Comment).''

[4] See *http://www.epa.gov/fueleconomy/regulations.htm* or *http://www.regulations.gov.*

easily understandable, and relevant information regarding the fuel economy of new vehicles. This final rule improves the information provided to consumers regarding the fuel economy of new vehicles.

The city fuel economy estimate is currently based on the Federal Test Procedure (FTP), which was designed to measure a vehicle's tailpipe emissions under urban driving conditions. The driving cycle used for the FTP was developed in the mid-1960's to represent home-to-work commuting in Los Angeles. The FTP is also one of the tests used to determine emissions compliance today. The FTP includes a series of accelerations, decelerations, and idling (such as at stop lights). It also includes starting the vehicle after it has been parked for an extended period of time (called a ''cold start''), as well as a start on a warmed-up engine (called a ''hot start''). The total distance covered by the FTP is about 11 miles and the average speed is about 21 mph, with a maximum speed of about 56 mph.

The highway fuel economy estimate is currently based on the Highway Fuel Economy Test (HFET), which was developed by EPA in 1974 and was designed to represent a mix of interstate highway and rural driving. It consists of relatively constant higher-speed driving, with no engine starts or idling time. The HFET covers a distance of about 10 miles, at an average speed of 49 mph and a top speed of about 60 mph.

A fundamental issue with today's fuel economy estimates is that the underlying test and calculation procedures do not fully represent current real-world driving conditions. Some of the key limitations are that the highway test has a top speed of only 60 miles per hour, both the city and highway tests are run at mild climatic conditions (75 °F), both tests have mild acceleration rates, and neither test is run with the use of fuel-consuming accessories, such as air conditioning. Over the past few years, there have been several independent studies comparing EPA's fuel economy estimates to the real-world experience of consumers. These studies confirm that there is considerable variation in real-world fuel economy, and provide substantial evidence that EPA's mileage ratings often overestimate real-world fuel economy. Although these studies differ in a number of variables, including their test methods, driving conditions, and fuel economy measurement techniques, they indicate that EPA's approach to estimating fuel economy needs to be improved to better represent some key real-world fuel economy impacts.

The methods used today for calculating the city and highway mpg estimates have been in place since the 1970's, and the results of these methods were adjusted only once in the mid-1980's to bring them closer to consumer's expectations.[5] Since that time, there have been many changes affecting the way Americans drive—speed limits are higher, road congestion has increased, vehicle performance has increased, vehicle technologies have changed markedly, and more vehicles are equipped with energy-consuming accessories like air conditioning. Our analysis shows that these changes, along with several other factors, again indicate a need to revise the testing and calculation procedures underlying the fuel economy window sticker estimates.[6]

We believe the new fuel economy estimates will provide car buyers with useful information when comparing the fuel economy of different vehicles. It is important to emphasize that fuel economy varies from driver to driver for a wide variety of reasons, such as different driving styles, climates, traffic patterns, use of accessories, loads, weather, and vehicle maintenance. Even different drivers of the same vehicle will experience different fuel economy as these and other factors vary. Therefore, it is impossible to design a ''perfect'' fuel economy test that will provide accurate real-world fuel economy estimates for every consumer. With any estimate, there will always be consumers that get better or worse actual fuel economy. The EPA estimates are meant to be a general guideline for consumers, particularly to compare the relative fuel economy of one vehicle to another. Nevertheless, we do believe that the new fuel economy test methods will do a better job of giving consumers a more accurate estimate of the fuel economy they can achieve in the real-world. Under the new methods, the city mpg estimates for the manufacturers of most vehicles will drop by about 12 percent on average relative to today's estimates. City estimates for some of the most fuel-efficient vehicles, including gasoline-electric hybrid vehicles, will decrease by 20 to 30 percent. The highway mpg estimates for most vehicles will drop on average by about 8 percent, with some estimates dropping by as much as 25 percent relative to today's estimates.

While the inputs to our estimates are based on data from actual real-world driving behavior and conditions, it is essential that our fuel economy estimates continue to be derived primarily from controlled, repeatable, laboratory tests. Because the test is controlled and repeatable, an EPA fuel economy estimate can be used for comparison of different vehicle models and types. In other words, when consumers are shopping for a car, they can be sure that the fuel economy estimates were measured using a ''common yardstick''—that is the same test run under the exact same set of conditions, making the fuel economy estimates a fair comparison from vehicle-to-vehicle. While some organizations have issued their own fuel economy estimates based on real-world driving, such an approach introduces a wide number of often uncontrollable variables—different drivers, driving patterns, weather conditions, temperatures, etc.—that make repeatable tests impossible. Our new fuel economy test methods are more representative of real-world conditions than the current fuel economy tests—yet we retain our practice of relying on controlled, repeatable, laboratory tests. EPA and manufacturers test over 1,250 vehicle models annually and every test is run under an identical range of conditions and under a precise driver's trace, which assures that the result will be the same for an individual vehicle model no matter when and where the laboratory test is performed. Variations in temperature, road grade, driving patterns, and other variables do not impact the result of the test. While such external conditions impact fuel economy on a trip-to-trip basis, they do not change the laboratory test result. Therefore, a repeatable test provides a level playing field for all vehicles, which is essential for comparing the fuel economy of one vehicle to another. Finally, EPA must preserve the ability to confirm the values achieved by the manufacturers' testing, and this can only be achieved with a highly repeatable test or set of tests.

In the Energy Policy Act of 2005, Congress required EPA to revise the fuel economy labeling methods to better reflect a variety of real-world factors that affect fuel economy. Section 774 of

[5] In 1984, EPA published new fuel economy labeling procedures that were applicable to 1985 and alter model year vehicles. Based on in-use fuel economy data collected at the time, it was evident that the fuel economy estimates needed to be adjusted downward in order to more accurately reflect consumers' average fuel economy experience. The city values (based on the raw FTP test data) were adjusted downward by 10 percent and the highway values (likewise based on the raw highway test data) were adjusted downward by 22 percent. See 49 FR 13832 (April 6, 1984).

[6] See the Technical Support Document and ''Vehicle Fuel Economy Labeling and the Effect of Cold Temperature, Air-Conditioning Usage and Aggressive Driving on Fuel Economy,'' by Eldert Bontekoe and Richard A. Rykowski, 2005. These are available in the public docket for review.

the 2005 Energy Policy Act directs EPA to ''* * * update or revise the adjustment factors in [certain sections of the fuel economy labeling regulations] to take into consideration higher speed limits, faster acceleration rates, variations in temperature, use of air conditioning, shorter city test cycle lengths, current reference fuels, and the use of other fuel depleting features.'' This final rule fully addresses this statutory requirement. Section VII contains a detailed analysis of the statute and regulations.

B. What Requirements Are We Adopting?

This final rule establishes new methods for determining the city and highway fuel economy estimates for the sole purpose of fuel economy labeling by incorporating fuel economy results over a broader range of driving conditions. The new methodology will result in EPA fuel economy estimates that better approximate the miles per gallon that consumers achieve in real-world driving. These changes include some revisions to existing test procedures. In addition, we are revising the format and content of the fuel economy label to make the information more useful and easily understandable to consumers. The new rule also requires that medium-duty passenger vehicles (a subset of vehicles 8,500 to 10,000 lbs gross vehicle weight) have fuel economy labels. We also are finalizing minor changes related to the fuel economy information program, including revising the comparable vehicle classes and adding a new provision for the electronic distribution of the annual Fuel Economy Guide. An overview of each of these requirements follows, with additional detail provided in subsequent sections of this final rule.

1. Revised Methods for Calculating City and Highway Fuel Economy Estimates

This final rule revises the test methods by which the city and highway fuel economy estimates are calculated. We are replacing the current method, established in 1984, of adjusting the city (FTP) test result downward by 10 percent and the highway (HFET) test result downward by 22 percent. Instead, we are finalizing the proposed approach that incorporates additional test methods that address factors that impact fuel economy but that are missing from today's tests—specifically, higher speeds, more aggressive driving (e.g., higher acceleration rates), the use of air conditioning, and the effect of cold temperature and other factors.

Since 1984 when we last updated the fuel economy estimate methodology, EPA has established several new test cycles for emissions certification. EPA had become concerned that the FTP omitted many critical driving modes and conditions that existed in actual use, and that emissions could be substantially higher during these driving modes compared to the FTP.[7] Manufacturers frequently designed their vehicles' emission control systems to meet the specified FTP test conditions, often neglecting emissions control over other driving conditions, resulting in higher real-world emissions.

The need for action to address off-cycle emissions was recognized by Congress in the passage of Sections 206(h) and 202(j) of the Clean Air Act Amendments of 1990 (CAAA). Section 206(h) required EPA to study and revise as necessary the test procedures used to measure emissions, taking into consideration the actual current driving conditions under which motor vehicles are used, including conditions relating to fuel, temperature, acceleration, and altitude. Section 202(j) of the CAAA required EPA to establish emission standards for carbon monoxide under cold (20°F) temperature conditions.

In 1992, EPA published rules implementing the 202(j) cold temperature testing requirement, acknowledging that the ambient temperature conditions of the FTP test (run between 68 and 86 °F) did not represent the full range of ambient temperature conditions that exist across the United States and that cold temperature had different emissions effects on different vehicle designs.[8] EPA's cold temperature emission regulations required manufacturers to conduct FTP testing at 20 °F. By promulgating this new test procedure and associated carbon monoxide emission standard, EPA sought to encourage manufacturers to employ better emission control strategies that would improve ambient air quality across a wider range of in-use temperature conditions.

In fulfillment of the 206(h) CAAA requirement, EPA published a report in 1993 which concluded that the FTP cycle did not represent the full range of urban driving conditions that could impact the in-use driving emission levels.[9] Consequently, EPA promulgated a rule in 1996 that established two new test procedures, with associated emission standards, that addressed certain shortcomings with the current FTP. Known as the ''Supplemental FTP,'' or ''SFTP,'' these procedures, similar to the cold temperature FTP, encouraged the use of the better emission controls across a wider range of in-use driving conditions in order to improve ambient air quality.[10]

One of the SFTP test cycles, the US06, was designed to address high speed, aggressive driving behavior (with more severe acceleration rates) and rapid and frequent speed fluctuations. The US06 test contains both lower-speed city driving and higher-speed highway driving modes. Its top speed is 80 mph, and average speed is 48 mph. The top acceleration rate exceeds 8 mph per second. The other SFTP test, the SC03, was designed to address air-conditioner operation under a full simulation of high temperature (95 °F), high sun-load, and high humidity. The SC03 drive cycle was designed to represent driving immediately following a vehicle startup, and rapid and frequent speed fluctuations. Its top speed is about 55 mph and average speed is 22 mph. The top acceleration rate is about 5 mph per second.

The basis for the SFTP rulemaking was a study of real-world driving in four cities, Baltimore, Spokane, Atlanta and Los Angeles, where driving activity was measured on instrumented vehicles as well as by chase cars.[11] At that time, it was found that 18 percent of the driving (in Baltimore) occurred outside of the speed/acceleration distribution of the FTP drive schedule. More recent real-world driving activity data indicates that driving has become even more aggressive than it was in 1992. Recent real-world activity data collected in California and Kansas City found that about 28 percent of driving (vehicle miles traveled) is at speeds greater than 60 mph. Further, about 33 percent of recent real-world driving falls outside of the FTP/HFET speed and acceleration activity region. This is based on extensive chase car studies in California and instrumented vehicle studies in Kansas City.[12] Our assessment of these

[7] Emissions from driving modes not reflected on EPA test procedures became known as ''off-cycle'' emissions, meaning that they occurred during driving conditions not typically encountered over EPA's emission test cycle.

[8] *See* 57 FR 31888 (July 17, 1992).

[9] U.S. Environmental Protection Agency. Federal Test Procedure Review Project: Preliminary Technical Report. U.S. Environmental Protection Agency, No. EPA420–R–93–007, May 1993.

[10] *See* 61 FR 54852 (October 22, 1996).

[11] These studies were not designed to produce results that would be representative of driving behaviors throughout the U.S. Nonetheless, they were the best and most current data upon which to base design of the new test cycles.

[12] A ''chase car'' study is a study in which driving behavior is recorded by an instrumented vehicle that follows vehicles on the road to record the behavior of the followed vehicle. In some cases the chase car is equipped with a laser rangefinder to enable the data collection systems to accurately

Continued

recent real-world driving activity studies is described in detail in the Technical Support Document.

Clearly, the FTP and HFET tests alone do not fully capture the broad range of real-world driving conditions; indeed, this has already been conclusively demonstrated by the research that led to the revision of the FTP for emission test purposes. In order for EPA's fuel economy tests to be more representative of key aspects of real-world driving, it is critical that we consider the test conditions represented by these additional emission tests. The additional test methods will bring into the fuel economy estimates the test results from the five emissions tests in place today: FTP, HFET, US06, SC03, and Cold FTP. Thus, we refer to this as the ''5-cycle'' method. The five test procedures that make up the 5-cycle method and some of their key characteristics are summarized in the table below.

TABLE I–1.—CHARACTERISTICS OF THE FUEL ECONOMY AND EMISSION TESTS OF THE 5-CYCLE METHODOLOGY

Test	Designed to represent	Avg speed (mph)	Max speed (mph)	Max accel (mph/sec)	Ambient conditions	Primary use
Federal Test Procedure (FTP).	Urban stop-and-go driving from 1970's.	21	58	3.3	75 °F	Emissions & fuel economy testing.
Highway Fuel Economy Test (HFET).	Rural driving	48	60	3.3	75 °F	Fuel economy testing.
US06	High speeds and aggressive driving.	48	80	8.5	75 °F	Emissions testing.
SC03	Air conditioner operation.	22	55	5.1	95 °F & 40% relative humidity.	Emissions testing.
Cold FTP	Cold temperature operation.	21	58	3.3	20 °F	Emissions testing.

Under the new requirements, rather than basing the city mpg estimate solely on the adjusted FTP test result, and the highway mpg estimate solely on the adjusted HFET test result, each estimate will be based on a ''composite'' calculation of all five tests, weighting each appropriately to arrive at new city and highway mpg estimates. The new city and highway estimates will each be calculated according to separate city and highway ''5-cycle'' formulae that are based on fuel economy results over these five tests. The conditions represented by each test will be ''weighted'' according to how frequently those conditions occur over average real-world city or highway driving. For example, we have derived weightings to represent driving cycle effects, trip length, air conditioner compressor-on usage (it is the activity of the compressor that most significantly affects emissions and fuel economy), and operation over various temperatures. This methodology is described in detail in Section II and in the Technical Support Document.

We also are finalizing a downward adjustment to account for effects that are not reflected in our existing five test cycles. There are many factors that impact fuel economy, but are difficult to account for in the test cell on the dynamometer. These include roadway roughness, road grade (hills), wind, low tire pressure, heavier loads, hills, snow/ice, effects of ethanol in gasoline, larger vehicle loads (e.g., trailers, cargo, multiple passengers), and others. We need to account for these factors in our new fuel economy calculation methods, as they will lower a driver's fuel economy beyond those factors represented by our existing test cycles. We are finalizing a 9.5 percent downward adjustment to account for these non-dynamometer effects, based on detailed analyses of the impacts of each of these factors using the most recent technical information and studies available. Additional detail regarding this factor can be found in Section II and in the Technical Support Document.

Because the 5-cycle method is inherently vehicle-specific, the difference between today's label values and the new fuel economy estimates may vary significantly from vehicle to vehicle. In general, however, the new approach will result in city fuel economy estimates that are about 8 to 15 percent lower than today's labels for the majority of conventional vehicles. The city mpg estimates for the manufacturers of most vehicles will drop by about 12 percent on average relative to today's estimates. For vehicles that achieve generally better fuel economy, such as gasoline-electric hybrid vehicles, new city estimates will be about 20 to 30 percent lower than today's labels. The new highway fuel economy estimates will be about 5 to 15 percent lower for the majority of vehicles, including most hybrids. The highway mpg estimates for the manufacturers of most vehicles will drop on average by about 8 percent, with estimates for most hybrid vehicles dropping by 10 to 20 percent relative to today's estimates.

This final rule will greatly improve the EPA fuel economy estimates, so that they come closer to the fuel economy that consumers achieve in the real world. However, these are still estimates, and even with the improved fuel economy test methods we are finalizing today, some consumers will continue to get fuel economy that is higher or lower than the new estimates. No single test or set of tests can ever account for the wide variety of conditions experienced by every driver.

2. New Labeling Requirement for Medium-Duty Passenger Vehicles

Based on the public comments and on specific events that have transpired since the NPRM was published, we are finalizing in this rule a fuel economy labeling program for Medium-Duty Passenger Vehicles (MDPVs), a subset of vehicles between 8,500 and 10,000 lbs GVWR.

MDPVs were first defined in the regulation that put in place the ''Tier 2'' emission standards and gasoline sulfur controls.[13] This newly-defined class of vehicles includes SUVs and passenger vans between 8,500 and 10,000 lbs GVWR, but excludes large pick-up trucks. The specific regulatory definition was designed to capture in the light-duty vehicle emissions

determine the speed of the chased vehicle relative to the chase car. An instrumented vehicle study is a study in which data is collected from customer vehicles where the customer has agreed to allow their vehicle to be equipped with data collection instrumentation.

[13] See 65 FR 6698 (Feb. 10, 2000).

program some of the heavy-duty vehicles that are designed and used predominantly for passenger use.

Under the Energy Policy and Conservation Act (EPCA), EPA is required to establish regulations that require a manufacturer to attach a label to each ''automobile'' manufactured in a model year.[14] ''Automobile'' is defined as a vehicle not more than 6,000 lbs GVWR, and those vehicles between 6,000 and 10,000 lbs GVWR that DOT determines are appropriate for inclusion in the Corporate Average Fuel Economy (CAFE) program.[15] ''Automobile'' for the purposes of labeling also includes vehicles at no more than 8,500 lbs GVWR whether or not the Department of Transportation (DOT) has included those vehicles in the CAFE program.[16] EPA has no authority to require labels on vehicles that are not automobiles, therefore EPA has no authority to require labeling of either vehicles above 10,000 lbs GVWR, or vehicles between 8,500 and 10,000 lbs GVWR that are not included by DOT in the CAFE program.

Since the time of EPA's proposal, DOT has included some vehicles above 8,500 lbs GVWR and below 10,000 lbs in its CAFE program, beginning in model year 2011.[17] Since these vehicles now meet the definition of automobile, EPA is authorized to include these vehicles in labeling program. This final rule requires fuel economy labels on these MDPVs beginning in model year 2011.

3. Improved Fuel Economy Label Design

We are adopting a new fuel economy label format that is easier to read, has improved graphic design, and contains information that should be more useful to prospective car buyers. The final label design reflects input from the public comments received and from market testing of prototype label designs conducted via a series of focus groups. In addition to displaying revised city and highway mpg estimates, the new label features the following items:

- A new layout featuring an updated fuel pump graphic, a prominent heading, and prominent government logos;
- More prominent estimated annual fuel cost information, including the addition of the basis for the estimated annual fuel cost (dollars per gallon and miles driven per year);
- An easy-to-use graphic that allows quick comparison of the labeled vehicle with other vehicles in its class;
- A simplified statement noting that ''Your mileage will vary'';
- A link to the EPA/DOE Web site *www.fueleconomy.gov*; and,
- A transition statement noting that the mpg estimates are the result of new EPA methods beginning with the 2008 models (for inclusion on labels of model year 2008 and 2009 vehicles only).

Details about the label design and content are found in Section III. An example label is shown below (actual size of the label is required by statute to be 4.5 inches tall by 7 inches wide).

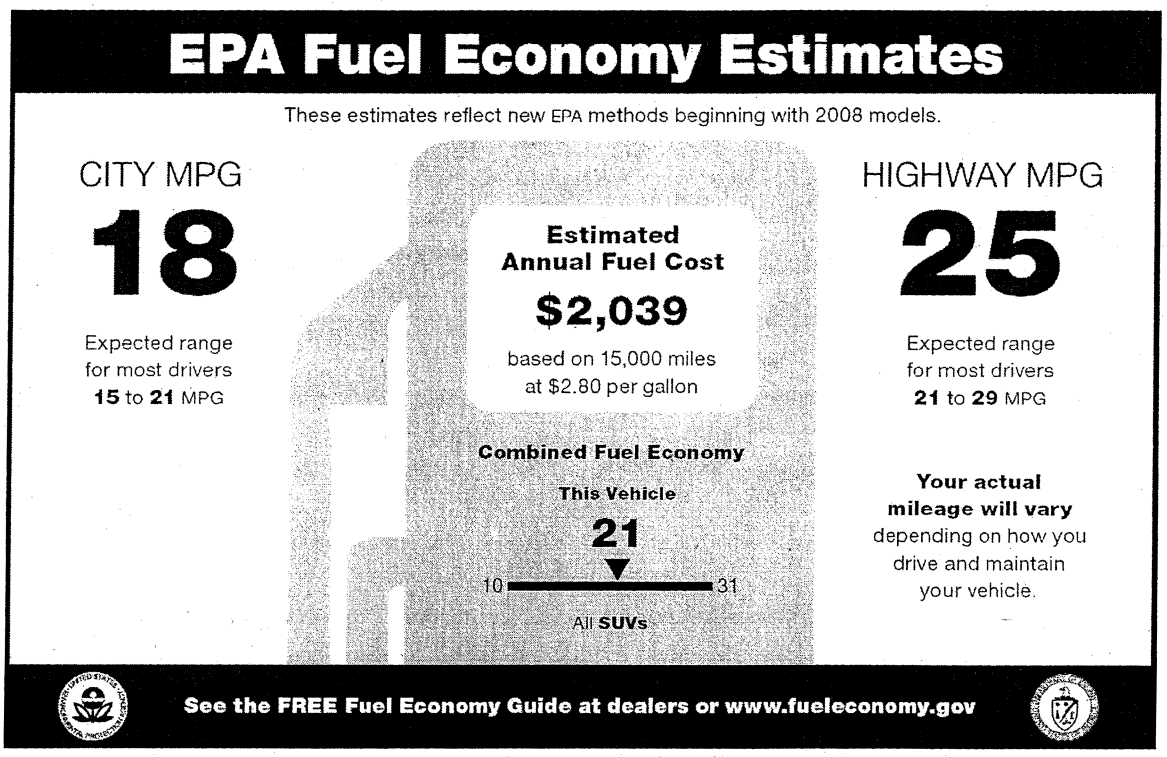
[14] See 49 U.S.C. 32908(b).

[15] See 49 U.S.C. 32901(a)(3).

[16] See 49 U.S.C. 32908(a).

[17] See 71 FR 17565 (April 6, 2006).

Figure I-1: Example of New Fuel Economy Label



* Combined fuel economy is based on a weighted harmonic average of city and highway mpg, where city is weighted 55% and highway is weighted 45%. The estimated annual fuel cost is based on the combined fuel economy.

4. New Vehicle Class Categories and Definitions

EPCA requires that the label contain "the range of fuel economy of comparable automobiles of all manufacturers." [18] EPA regulations define what constitutes "comparable automobiles." We proposed and are finalizing changes to the vehicle class categories to better reflect the current vehicle market and to allow consumers to make more appropriate fuel economy comparisons. Specifically, we are finalizing our proposal to add the vehicle class categories of "Sport Utility Vehicle" and "Minivan," with appropriate definitions, to the list of categories used to classify vehicles for fuel economy comparison purposes. We are also redefining the "Small Pickup Truck" class by increasing the weight limit criteria. Section VI contains additional detail on these changes.

[18] See 49 U.S.C. 32908(b)(1)(C).

5. Test Procedure Modifications

We are finalizing several changes to existing test procedures to allow the collection of appropriate fuel economy data and to ensure that existing test procedures better represent real-world conditions. Specifically, we are finalizing the following test procedure changes:

- A revised US06 test protocol that will collect the US06 exhaust emissions in two emissions samples (bags) in order to separately assess city and highway fuel economy over this test, with several alternative methods of determining a two-bag result allowed);
- Mandatory operation of the heater/defroster during the cold temperature FTP for emissions and fuel economy testing;
- Testing diesel vehicles on the cold temperature FTP; and
- Requiring hybrid vehicles to perform all four phases/bags of the FTP.

Details regarding these changes are described in Section IV.

C. Why Is EPA Taking This Action?

1. Energy Policy Act of 2005

In the Energy Policy Act of 2005, Congress required EPA to update or revise adjustment factors to better reflect a variety of real-world factors that affect fuel economy. Section 774 of the Energy Policy Act directs EPA to " * * * update or revise the adjustment factors in [certain sections of the fuel economy labeling regulations] to take into consideration higher speed limits, faster acceleration rates, variations in temperature, use of air conditioning, shorter city test cycle lengths, current reference fuels, and the use of other fuel depleting features." This final rule does take into account these conditions and will address this statutory requirement. The Energy Policy Act of 2005 and other relevant statutes are discussed in greater detail in Section VII.

2. Comparing EPA Estimates to Actual Driving Experience

First, it is important to stress that the EPA city and highway mpg numbers are

estimates—they cannot give consumers an exact indication of the fuel economy they will achieve. The complete range of consumer fuel economy experience can not be represented perfectly by any one number. Fuel economy varies based on a wide range of factors, some of which we have discussed above. There will always be consumers that achieve real-world fuel economy both better and worse than a given estimate.

In recent years, there have been a number of studies, conducted by a variety of sources, suggesting that there is often a shortfall between the EPA estimates and real-world fuel economy. Several organizations have provided consumers with their own fuel economy estimates, which in some cases vary significantly from EPA's estimates. Each of these studies differs in its test methods, driving cycles, sampling of vehicles, and methods of measuring fuel economy. There are strengths and weaknesses of each study, which we discuss further in the Technical Support Document. Collectively, these studies indicate there are many cases where real-world fuel economy falls below the EPA estimates. The studies also indicate that real-world fuel economy varies significantly depending on the conditions under which it is evaluated. Nevertheless, taken as a whole, these studies reflect a wide range of real-world driving conditions, and show that typical fuel economy can be much lower than EPA's current estimates.

3. Representing Real-World Conditions on the Fuel Economy Tests

The current city and highway fuel economy tests do not represent the full range of real-world driving conditions. The 1985 adjustment factors were designed to ensure that the fuel economy estimates across the vehicle fleet reflected the average impacts of a number of conditions not represented on the tests. However, as we noted earlier, many changes have occurred since then that make it once again desirable to reevaluate the fuel economy test methods and adjustment factors. Given the significant degree of variation that is apparent across vehicles, we believe it is important to reconsider the approach of ''one-size-fits-all'' adjustment factors and instead move to an approach that more directly reflects the impacts of fuel economy on individual vehicle models.

There are several key limitations in the FTP and HFET tests that cause them to not adequately reflect real-world driving today. First, most consumers understandably think ''highway'' fuel economy means the fuel economy you can expect under freeway driving conditions. In fact, the highway test has a top speed of 60 mph, since the test was developed more than 20 years ago to represent rural driving conditions at a time when the national speed limit was 55 miles per hour. The national speed limit has since been eliminated, many states have established speed limits of 65 to 70 miles per hour, and much driving is at even higher speeds. Recent real-world driving studies indicate that about 28 percent of driving (vehicle miles traveled, or VMT) is at speeds of greater than 60 mph. (This analysis is detailed in the Technical Support Document.) These studies also show that 33 percent of real-world driving VMT falls outside the FTP/HFET speed and acceleration activity region. Thus, a substantial amount of high speed driving behavior is not captured in today's FTP or HFET tests. This is a weakness in our current fuel economy test procedures. Since higher speed driving has a negative impact on fuel economy, incorporating these higher speed driving conditions into the fuel economy tests would lower the fuel economy estimates.

Second, the maximum acceleration rates of both the FTP and HFET tests are a relatively mild 3.3 miles-per-hour per second (mph/sec), considerably lower than the maximum acceleration rates seen in real-world driving. Recent real-world driving studies indicate that maximum acceleration rates are as high as 11 to 12 mph/sec and significant activity occurs beyond 3.3 mph/sec. (This analysis is detailed in the Technical Support Document.) At the time these tests were first developed, the real-world accelerations were higher than 3.3 mph/sec, but the test cycle's acceleration rates were limited to accommodate the mechanical limitation of the dynamometer test equipment. These constraints no longer exist with today's dynamometers, so we now have the ability to incorporate higher maximum acceleration rates that more closely reflect those of actual driving. As with high speed driving, higher acceleration rates have a negative impact on fuel economy; thus, if these higher accelerations were factored into our fuel economy methods, the estimates would be lower.

The maximum deceleration rate of the FTP and HFET tests is important to consider as well, because it relates to the regenerative breaking effect of hybrid electric vehicles. The FTP and HFET tests include a mild maximum deceleration rate of -3.3 mph/sec; yet in recent real-world driving rates as high as -11 to -17 mph/sec were recorded. (This analysis is detailed in the Technical Support Document.) Under higher deceleration rates, the effects of regenerative breaking for hybrid electric vehicles are diminished, thereby lowering fuel economy. In this regard, today's FTP and HFET tests result in a higher fuel economy for hybrid vehicles than is achieved under typical driving conditions.

Third, both the FTP and HFET tests are run at mild ambient conditions (approximately 75 °F), while real-world driving occurs at a wide range of ambient temperatures. Moderate conditions tend to be optimal for achieving good fuel economy, and fuel economy is lower at temperatures colder or warmer than the 75 °F test temperature. Only about 20 percent of VMT occurs between 70 and 80 °F, approximately 15 percent of VMT occurs at temperatures above 80 °F, and 65 percent occurs below 70 °F. (This analysis is detailed in the Technical Support Document.) Moreover, neither the FTP nor HFET tests are run with accessories operating, such as air conditioners, heaters, or defrosters. These accessories, most notably air conditioning, can have a significant impact on a vehicle's fuel economy.

Finally, there are many factors that affect fuel economy that cannot be replicated on dynamometer test cycles in a laboratory. These include road grade, wind, vehicle maintenance (e.g., tire pressure), snow/ice, precipitation, fuel effects, and others. It is not possible to develop a test cycle that captures the full range of factors impacting fuel economy. However, it is clear that the FTP and HFET tests alone are missing some important elements of real-world driving. All of these factors can reduce fuel economy. This largely explains why our current estimates often do not reflect consumers' real-world fuel economy experience.

D. When Will the New Requirements Take Effect?

1. New City and Highway Fuel Economy Estimates

We want the public to benefit from the improved information provided by the new fuel economy estimates as soon as possible. Therefore, these new regulations take effect with the 2008 model year vehicles, which will be available for sale at dealers in 2007. We believe this is the earliest possible date for implementation. Manufacturers can legally begin selling 2008 models as early as January 2, 2007. However, we are phasing in the new test methods in order to provide manufacturers with sufficient lead time to plan for increased fuel economy testing necessitated by the 5-cycle approach.

For the first three model years (2008 through 2010), we provide manufacturers with the option of deriving the 5-cycle fuel economy using a scale of adjustments based on an analysis of data developed from the 5-cycle method. This approach, called the ''mpg-based'' method, incorporates the effects of higher speed/aggressive driving, air conditioning use, and colder temperatures, but less directly than the 5-cycle vehicle-specific method.[19] The mpg-based adjustments were derived by applying the 5-cycle formulae to a data set of recent fuel economy test data, and developing a regression line through the data. (See Section II for a full description of this approach). These adjustments differ based on the mpg a vehicle obtains over the FTP (City) or HFET (Highway) tests. In other words, every vehicle with the same mpg on the FTP test receives the same adjustment for its city fuel economy label. Likewise, every vehicle with the same mpg on the HFET test will receive the same adjustment for its highway fuel economy label. This method of adjustment would not require any testing beyond the FTP/HFET tests already performed today, thus, it can be implemented sooner than the 5-cycle approach as an interim improvement to our fuel economy test methods. However, during this time frame, manufacturers may optionally choose to run full 5-cycle testing for any of their vehicle models.[20] The phase-in will provide consumers with more accurate estimates as soon as possible, while allowing the industry the necessary lead time to prepare for the necessary testing under the 5-cycle approach.

Starting with the 2011 model year, the 5-cycle approach will be required. Under this approach, the manufacturers will be required to implement vehicle-specific 5-cycle testing across some portion of their fleet. The manufacturers will use the emission certification test results over the five test procedures to calculate 5-cycle city and highway fuel economy values. However, we are finalizing criteria as proposed that will allow continued use of the mpg-based adjustments in cases where we can predict with reasonable certainty that the fuel economy results under the mpg-based approach will not differ significantly from the results achieved by the 5-cycle method. These criteria and the methodology by which vehicles are selected for 5-cycle testing in the 2011 and later model years are described in detail in Section II.

2. Implementation of New Label Design

In order to allow manufacturers to transition to the new label format, we are allowing use of the new label format to be optional until September 1, 2007. This date aligns with the date manufacturers must place National Highway Traffic Safety Administration (NHTSA) crash test ratings on the vehicle pricing labels of all vehicles manufactured as of that date. The September 1, 2007 date allows manufacturers to redesign their vehicle pricing labels only once to incorporate two new federal labeling requirements. However, we encourage manufacturers to implement the new label format as quickly as possible such that the majority of 2008 vehicles on dealer lots exhibit the new label format. All 2008 model year vehicles must use the new methods to calculate fuel economy estimates. Labels on all 2008 models will have a statement indicating that the fuel economy estimates are based on new methods.

3. Fuel Economy Labeling of Medium-Duty Passenger Vehicles

The requirement for MDPVs to be labeled with city and highway fuel economy estimates begins with the 2011 model year. EPA does not have the authority to require labeling of MDPVs sooner because of our authority is linked to NHTSA's determination of CAFE standards for vehicles over 8,500 lbs GVWR.[21] However, we encourage manufacturers to voluntarily label these vehicles sooner, if at all possible. Many vehicles in the MDPV category have counterpart models below 8,500 lbs GVWR, and these vehicles receive fuel economy labels today.

E. Periodic Evaluation of Fuel Economy Labeling Methods

In the proposal, we expressed an interest in ensuring that the new methods continue to reflect real-world fuel economy into the future, and we encouraged stakeholders to submit data that would inform future analysis and potential changes to the methodology. We believe it is critical to ensure that the fuel economy methods are periodically evaluated. We are committed to evaluating the 5-cycle method every several years (e.g., five years) to ensure that it appropriately accounts for advancements in vehicle technology, changes in driving patterns, and any new data collected on in-use fuel economy. We also remain open to reviewing any valid test data indicating that any of our assumptions were inappropriate for a specific vehicle and considering modifications to the 5-cycle formulae overall to account for these differences. In the public comments, some stakeholders expressed an interest in conducting studies of in-use fuel economy. We welcome stakeholders to submit any such future data for use in our periodic evaluation of the fuel economy test methods.

We are also committed to offering technical guidance to any stakeholder interested in undertaking an in-use testing and data-collection program. By seeking our technical input up front, stakeholders can better ensure that the data is collected in a way that is ultimately best-suited to evaluate potential changes to the methodology. However, we note that collecting in-use fuel economy data alone can only indicate whether or not the 5-cycle estimates are accurate; it would not provide the information needed to actually improve the 5-cycle equations. The 5-cycle approach is based on emission test results over the five test cycles and on the weighting of a number of factors based on their average impact across all U.S. driving. Data on in-use fuel economy alone, without complementary driving behavior and activity data representative of the fleet, is insufficient to initiate changes that may be appropriate to the 5-cycle weighting factors.

Finally, several commenters suggested that EPA conduct an evaluation of the 5-cycle method prior to model year 2011, when the 5-cycle method becomes required. If appropriate data is submitted prior to the end of 2008, we would plan to review it in a timely manner. If such data suggests that changes to the 5-cycle approach are necessary, we would plan to issue a separate rulemaking to address changes to the methodology, providing adequate lead time to the industry to comply.

F. This Final Rule Does Not Impact CAFE Standards or Test Procedures

This final rule does not alter the FTP and HFET driving cycles, the measurement techniques, or the calculation methods used to determine CAFE. EPCA requires that CAFE for passenger automobiles be determined from the EPA test procedures in place as of 1975 (or procedures that give comparable results), which are the city and highway tests of today, with a few small adjustments for minor procedural changes that have occurred since

[19] The ''mpg-based'' method is termed the ''derived 5-cycle'' approach in the regulatory text.

[20] Any manufacturer that chooses to optionally use the 5-cycle approach prior to the 2011 model year must use that approach to determine both city and highway label estimates.

[21] See 49 U.S.C. 32908, 32901(a)(3)(B), and Section VII for a detailed explanation of EPA's legal authority.

1975.[22] This final rule will not impact the CAFE calculations.

G. Public Participation

A wide variety of interested parties participated in the rulemaking process that culminates with this final rule. This process provided opportunity for public comment following the proposal published on February 1, 2006.[23] We held a public hearing on the proposal in Romulus, Michigan on March 3, 2006. At that hearing, oral comments on the proposal were received and recorded. A written comment period remained open until April 3, 2006. Comments and hearing testimony have been placed in the docket for this rule. We considered these comments in developing the final rule.

We have prepared a detailed Response to Comments document, which describes the comments we received on the proposal and our response to each of these comments. The Response to Comments is available in the docket for this rule and on the EPA Web site.[24]

II. New Test Methods and Calculation Procedures for Fuel Economy Labels

The current fuel economy label values are based on measured fuel economy over city and highway driving cycles, which are then adjusted downward by 10 and 22 percent, respectively, to account for a variety of factors not addressed in EPA's vehicle test procedures. These adjustments are intended to account for differences between the way vehicles are driven on the road and over the test cycles. Such differences include air conditioning use, higher speeds, more aggressive accelerations and decelerations, widely varying ambient temperature and humidity, varying trip lengths, wind, precipitation, rough road conditions, hills, etc. The purpose of the new methods is to expand the basis for the fuel economy labels to include actual vehicle testing over a wider range of driving patterns and ambient conditions than is currently covered by the city (FTP) and highway (HFET) fuel economy tests.

For example, vehicles in the real world are often driven more aggressively and at higher speeds than is represented in the FTP and HFET tests. The incorporation of measured fuel economy over the US06 test cycle into the fuel economy label values will make the label values more realistic. Drivers often use air conditioning in warm, humid conditions, while the air conditioner is turned off during the FTP and HFET tests. The incorporation of measured fuel economy over the SC03 test cycle into the fuel economy label values will reflect the added fuel needed to operate the air conditioning system. Vehicles also often are driven at temperatures below 75°F, at which the FTP and HFET tests are performed. The incorporation of measured fuel economy over the cold temperature FTP test into the fuel economy label values will reflect the additional fuel needed to start up a cold engine at colder temperatures.

The new vehicle-specific, 5-cycle approach to calculating fuel economy labels will incorporate estimates of the fuel efficiency of each vehicle during high speed, aggressive driving, air conditioning operation and cold temperatures into each vehicle's fuel economy label. It will combine measured fuel economy over the two current fuel economy tests, the FTP and HFET, as well as that over the US06, SC03 and cold FTP tests into estimates of city and highway fuel economy for labeling purposes. The test results from each cycle (and in some cases, portions of cycles or emission ''bags'')[25] will be weighted to represent the contribution of each cycle's attributes to onroad driving and fuel consumption. The vehicle-specific, 5-cycle approach will eliminate the need to account for the effect of aggressive driving, air conditioning use and colder temperatures on fuel economy through generic factors (as done today) which may not appropriately reflect that particular vehicle's sensitivity to these factors. A generic adjustment is still necessary to account for factors not addressed by any of the five dynamometer tests (e.g., road grade, wind, low tire pressure, gasoline quality, etc.). The derivation of this adjustment factor is discussed further below and in Chapter III of the Technical Support Document.

Currently, the US06, SC03 and cold FTP tests are only performed on a sub-set of new vehicle configurations, and only for emissions compliance purposes. In contrast, for fuel economy purposes, FTP and HFET tests are performed on many more vehicle configurations. In order to minimize the number of additional US06, SC03 and cold FTP tests resulting from the new testing and calculation procedures, we are allowing manufacturers to estimate the fuel economy over these three tests for vehicle configurations that are not normally tested for emissions compliance purposes, using the fuel economy measurements that are normally available. This is currently done on a more limited basis for both the FTP and HFET, and is referred to as analytically derived fuel economy (ADFE).[26] This method uses test data to determine the sensitivity of fuel economy to various vehicle parameters, and once these relationships are well established, we will issue guidance that provides manufacturers with the appropriate equations to use. We believe that these provisions are designed to represent a reasonable balance between the need for accurate fuel economy data and the need to contain the cost of testing for both industry and EPA, where we reasonably believe that actual testing would not produce a significantly different result. We always retain the right to order actual confirmatory testing where appropriate.

We also are finalizing the proposed provisions that allow manufacturers to use the interim approach to fuel economy label estimation, the ''mpg-based'' approach described below, when the available 5-cycle fuel economy data indicate that a vehicle test group's 5-cycle fuel economy is very close to that estimated by the mpg-based curve. The mpg-based method will also be used to determine label values for MDPVs that become mandatory with the 2011 model year, as discussed further in Section II.E.2.

Even with these provisions, we expect that some manufacturers will have to perform some additional US06, SC03, or cold FTP tests to address differences in vehicle designs which are not covered by the analytical derivation methodology. Other manufacturers may voluntarily choose to perform additional tests voluntarily to improve accuracy over the analytical derivation methodology, especially in cases where

[22] See 49 U.S.C. 32904(c).

[23] See 71 FR 5426 (Feb. 1, 2006).

[24] See *http://www.epa.gov/fueleconomy/* or *http://www.regulations.gov.*

[25] The FTP consists of two parts, referred to in the regulations as the ''cold start'' test and the ''hot start'' test. Each of these parts is divided into two periods, or ''phases'': a ''transient'' phase and a ''stabilized'' phase. Because the stabilized phase of the hot start test is assumed to be identical to the stabilized phase of the cold start test, only the cold start stabilized phase is typically run. These ''phases'' are often called ''bags,'' terminology that results from the sample bags in which the exhaust samples are collected. The phases are run in the following order: Cold start transient (Bag 1), cold start stabilized (Bag 2), and hot start transient (Bag 3).

[26] EPA's current policy for analytically derived fuel economy estimates for the FTP and HFET tests is contained in the EPA memorandum entitled, ''Updated Analytically Derived Fuel Economy (ADFE) Policy for 2005 Model Year,'' March 11, 2004, CCD–04–06 (LDV/LDT). This memorandum is issued under 40 CFR 600.006–89(e), which allows manufacturers to use analytical methods to determine fuel economy.

manufacturers have worked to improve fuel efficiency over the new test cycle conditions (e.g., during cold temperatures or with air conditioning on). Depending on how manufacturers choose to apply this method, this additional testing could prompt the construction or modification of test facilities. (Test burden and cost issues are discussed further in Section V of this preamble.) Therefore, in order to allow sufficient lead-time for the construction of these facilities, we are finalizing the proposed provisions that allow manufacturers the option of using an interim set of adjustments through the 2010 model year. These interim adjustments are not vehicle-specific, but instead reflect the effects of high speeds, hard accelerations, air conditioning use, and cold temperatures, etc., on the average vehicle. The vehicle-specific 5-cycle approach becomes mandatory with the 2011 model year. However, a manufacturer can voluntarily use the 5-cycle method prior to the 2011 model year for any vehicle model.[27]

The interim set of adjustments is termed the ''mpg-based'' approach. (See Figure II–1 for a graphical depiction of these adjustments.) The mpg-based approach is a sliding scale of adjustments which varies according to a vehicle's measured fuel economy over the FTP and HFET tests. The mpg-based adjustments were developed from applying the 5-cycle formulae to 615 recent model year vehicles and determining the average difference between the 5-cycle and current city and highway fuel economies.[28] Thus, because the data used to develop the mpg-based adjustments were derived from 5-cycle fuel economies, the mpg-based adjustments include the effects of high speeds, aggressive driving, air conditioning, and colder temperatures. However, they do so based on the impact of these factors on the average vehicle, not the individual vehicle, which is the case with the 5-cycle formulae. For example, for vehicles with fuel economy of 20–30 mpg over the FTP (i.e., city) test, the mpg-based approach would adjust the city fuel economy downward by 20–22 percent (or 4 to 7 mpg), versus today's single 10 percent downward adjustment. Thus, city fuel economy label values under the mpg-based approach tend to be about 11 percent lower on average than today's label values. For vehicles with fuel economy of 25–35 mpg over the HFET (i.e., highway) test, the mpg-based approach would adjust the highway fuel economy downward by about 28 percent (or 7 to 10 mpg), versus today's 22 percent downward adjustment. Thus, highway fuel economy label values under the mpg-based approach would tend to be about 8 percent lower than today's label values.

Given that both approaches utilize the 5-cycle fuel economy formulae in some fashion, it is useful to begin this section with a description of how the fuel economy measured over the 5 test cycles are combined to represent city and highway fuel economy. Then we will describe how the fleet-average formulae for the mpg-based approach were derived from these 5-cycle fuel economy estimates. Finally, we compare fuel economy label results from both the 5-cycle and mpg-based methods to onroad fuel economy data from a variety of sources.

Under the new methods, we are replacing the 0.90 and 0.78 adjustment factors for city and highway fuel economy, respectively, with new factors which are not simply constants. For model years 2008–2010, a manufacturer has the option of using two distinct methodologies to calculate the city and highway fuel economy values for any specific vehicle. One approach is called the mpg-based method, since the city and highway label values are based on the fuel economy (or mpg) measured over the FTP and HFET, respectively. The other approach is called the vehicle-specific 5-cycle approach, since the city and highway label values are based on the test results of five test cycles, the FTP, HFET, US06, SC03 and cold FTP. Both approaches also include an additional downward adjustment to represent effects not reflected in our existing laboratory dynamometer testing. Beginning with the 2011 model year, manufacturers are required to use the vehicle-specific 5-cycle method, but may still use the mpg-based approach on vehicles most sensitive to the new test conditions. Under the vehicle-specific 5-cycle approach, the fuel economy measurements over the 5 dynamometer test cycles will all be performed on (or estimated for) a specific vehicle in the current model year. The mpg-based approach uses historic fuel economy data over the 5 test cycles to estimate a fleet-wide average relationship between (1) FTP fuel economy and 5-cycle city fuel economy, and (2) HFET fuel economy and 5-cycle highway fuel economy. Under the mpg-based approach, a specific vehicle's city and highway fuel economy labels are based on this fleet-wide average relationship, as opposed to that vehicle's own results over the 5 test cycles. In other words, under the mpg-based approach every vehicle with the same fuel economy over the FTP test will receive the same city fuel economy label value. Likewise, every vehicle with the same fuel economy over the HFET test will receive the same highway fuel economy label value. This is illustrated further in Section II.B below. Below we present the specific equations under the two approaches which would be used to convert fuel economies measured over the dynamometer cycles into city and highway fuel economy values.

A. Derivation of the Vehicle-Specific 5-Cycle Methodology

The vehicle-specific, 5-cycle approach bases a vehicle's fuel economy label values on fuel economy measurements over five test cycles: FTP, HFET, US06, SC03 and cold FTP. These measurements are combined based on detailed estimates, or ''weightings,'' of how and when vehicles are driven, as well as under what ambient conditions. The 5-cycle formulae are derived from extensive data on real-world driving conditions, such as driving activity, temperatures, air conditioner operation, trip length, and other factors. We refer readers to the Technical Support Document for a detailed description of the development of the 5-cycle fuel economy formulae.

1. Overview of Public Comments on the 5-Cycle Methodology

Of those commenters addressing the 5-cycle formulae, most commented on the thoroughness of the analyses which supported the various cycle weighting factors (also called coefficients) included in the formulae. However, Honda, and to some extent Environmental Defense, criticized several aspects of the 5-cycle formulae. These comments are addressed in detail in the Response to Comments document. Overall, the key criticisms included:

(1) The 5-cycle formulae had not been validated for individual vehicles. In particular, these commenters claimed that the 5-cycle coefficients assume that all vehicles respond the same to various

[27] Any manufacturer that chooses to optionally use the 5-cycle approach prior to the 2011 model year must use that approach to determine both city and highway label estimates.

[28] Our database consists of 615 vehicles spanning the 2003 to 2006 model years. For these vehicles we have emission and/or fuel economy test data on all five test procedures. Additionally, manufacturers assisted with the development of this database by submitting detailed fuel economy data for the three phases (or ''bags'') of the FTP and the Cold FTP (EPA requires that they submit only the composite emissions and fuel economy data for certification or fuel economy labeling). The database includes data from 14 hybrid vehicles and one diesel vehicle, and represents all types of vehicles from all major manufacturers and most smaller manufacturers.

changes in driving pattern and ambient conditions;

(2) The three new test cycles represent extreme conditions, and;

(3) The 5-cycle method could penalize advanced fuel efficient technologies.

We present a summary of our responses to these three concerns below. Additional detail can be found in the Response to Comments Document.

First, all of the approaches to calculating label values involve relationships between driving activity or ambient conditions and fuel consumption. These relationships are never exact for each and every vehicle. The 5-cycle formulae utilize more vehicle-specific fuel consumption data than the mpg-based and current label approaches. Therefore, the 5-cycle approach is based on fewer assumptions regarding how individual vehicles react to temperature, soak time, low and high speed driving, aggressive driving, idling, air conditioning, etc. The 5-cycle method, by incorporating additional data from the three newer test cycles, improves our ability to estimate fuel economy outside of the conditions evaluated by the FTP and HFET tests. We provide examples and a detailed description of this analysis in the Technical Support Document.

Second, Honda states that the three new tests address vehicle conditions that are so extreme that their use in the above types of interpolations is actually worse than simply assuming that all vehicles have the same response to the conditions being addressed by the three tests. However, none of the available data indicates that this is the case, and Honda did not provide data to support their claim. All of the driving conditions addressed by the three tests clearly occur in-use. Our detailed analysis of recent real-world driving activity studies is contained in the Technical Support Document and Response to Comments document. In particular, use of fuel economy data over the cold FTP at 20 °F improves our ability to estimate fuel economy at 50 °F, compared to projecting fuel economy at 50 °F solely using the FTP test data at 75 °F. This analysis is detailed in the Technical Support Document as well.

Third, Honda states that these aspects of the 5-cycle formulae might actually penalize advanced fuel-efficient technology relative to conventional technology vehicles. Our comparisons of 5-cycle fuel economy for hybrids fall in the range of onroad fuel economy estimates developed by various organizations (see Section II of the Technical Support Document). It is true that the 5-cycle formulae decrease the fuel economy of some hybrid vehicles more than conventional vehicles, compared to the current label approach. However, this is easily explained by the way that current hybrid technology works under various operational and ambient conditions. For example, many current hybrid engine shut-off strategies cease to operate when the heater is turned on at cold temperatures. The current label approach assumes that any engine shut-off strategies operating over the FTP and HFET tests always operate in in-use. This is clearly not correct. Thus, some additional adjustment to current hybrid vehicle fuel economy is to be expected. Available data on hybrid fuel economy outside of the conditions addressed by the FTP and HFET confirm the impact of the 5-cycle formulae. We expect that future hybrid technology will significantly improve fuel economy over real-world conditions outside the FTP and HFET tests. Such improvements in real-world fuel economy will be reflected under the new 5-cycle estimates.

2. Changes to the 5-Cycle Methodology From Proposal

We received very few comments that provided new data with which to modify the proposed methodology. However, based on a few comments and new data we obtained, the methodology we are finalizing differs from the proposed methodology in three ways. First, we reevaluated an assumption with respect to the effect of ambient temperature on running fuel use. This reduced the weighting factor for cold temperature running fuel use. Second, we obtained new vehicle trip length data from extensive vehicle monitoring ongoing in Atlanta. This increased our estimate of trip length during city driving, which then reduced the contribution of start fuel use to average fuel consumption during city driving. Third, we updated our analyses based on the Federal Highway Administration's release of 2004 fuel economy estimates and revised 2003 fuel economy estimates. This analysis, along with addressing public comments, decreased the non-dynamometer adjustment factor slightly. Readers are referred to the Technical Support Document for detailed discussions of the analyses noted briefly below.

In response to Honda's comments regarding the assumptions involved in developing the 5-cycle formulae, we reevaluated our assumption regarding the effect of ambient temperature on running fuel use. This was the one area where the relationship in the proposed 5-cycle formula was based on a simple assumption of linearity and not on the results of actual vehicle testing. We performed an analysis of running fuel use of several vehicles tested at 20 °F, 50 °F, and 75 °F and determined that the effect was non-linear. Using the new relationship reduced the city and highway formulae's weighting of running fuel use at 20 °F from 0.30 to 0.18.

Since the time of the proposal, we also obtained vehicle trip data from extensive vehicle monitoring which is ongoing in Atlanta. Across a total of 668,000 vehicle trips, the average trip length was found to be 7.25 miles. This is 20 percent longer than found in Atlanta in the early 1990's. When we extrapolate this increase to the results of other studies performed in the early 1990's, we determined that a more reasonable estimate of trip length during city driving would be 4.1 miles, as opposed to the 3.5 mile estimate proposed in the 5-cycle city fuel economy formulae. This effectively reduces the contribution of start fuel use in the estimation of city fuel economy.

Also, since the proposal, the Federal Highway Administration published onroad fuel economy estimates for 2004, as well as a revised onroad fuel economy estimate for 2003. These estimates are roughly 3% lower than those contained in their 2003 report, which was the basis of our proposal. At the same time, Honda correctly pointed out that we had inappropriately assumed that the changes in FTP and HFET test procedures implemented with the Supplemental FTP rule increased measured fuel economy by 3%. These changes, plus other minor adjustments, led us to revise the factor for non-dynamometer effects from 0.89 to 0.905 (meaning that this factor further reduces both city and highway estimates by 9.5 percent). Detailed discussion and analyses of the non-dynamometer factor can be found in Section 5.0 of the Response to Comments document and Chapter III of the Technical Support Document.

With these revisions, under the vehicle-specific 5-cycle approach, the city fuel economy value will be calculated as follows:

$$\text{City FE} = 0.905 \times \frac{1}{(\text{Start FC} + \text{Running FC})}$$

Where:

$$\text{Start FC (gallons per mile)} = 0.330 \times \left(\frac{(0.76 \times \text{Start Fuel}_{75} + 0.24 \times \text{Start Fuel}_{20})}{4.1} \right)$$

Where:

$$\text{Start Fuel}_x \text{ for vehicles tested over a 3-bag FTP} = 3.6 \times \left(\frac{1}{\text{Bag 1 FE}_x} - \frac{1}{\text{Bag 3 FE}_x} \right)$$

Where:

Bag y FE_x = the fuel economy in miles per gallon of fuel during the specified bag of the FTP test conducted at an ambient temperature of 75 ° or 20 °F.

For hybrid gasoline-electric vehicles tested over a 4-bag FTP the calculation for start fuel consumption is somewhat different:

$$\text{Start FC (gallons per mile)} = 0.33 \times \left(\frac{(0.76 \times \text{Start Fuel}_{75} + 0.24 \times \text{Start Fuel}_{20})}{4.1} \right)$$

Where:

$$\text{Start Fuel}_{75} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{75}} - \frac{1}{\text{Bag 3 FE}_{75}} \right] + 3.9 \times \left[\frac{1}{\text{Bag 2 FE}_{75}} - \frac{1}{\text{Bag 4 FE}_{75}} \right]$$

and

$$\text{Start Fuel}_{20} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}} \right]$$

Likewise,

$$\text{Running FC} = 0.82 \times \left[\frac{0.48}{\text{Bag 2}_{75}\text{ FE}} + \frac{0.41}{\text{Bag 3}_{75}\text{ FE}} + \frac{0.11}{\text{US06 City FE}} \right] + 0.18 \times \left[\frac{0.5}{\text{Bag 2}_{20}\text{ FE}} + \frac{0.5}{\text{Bag 3}_{20}\text{ FE}} \right]$$
$$+ 0.133 \times 1.083 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{0.61}{\text{Bag 3}_{75}\text{ FE}} + \frac{0.39}{\text{Bag 2}_{75}\text{ FE}} \right) \right]$$

Where:

US06 FE = fuel economy in mile per gallon over the US06 test,

HFET FE = fuel economy in mile per gallon over the HFET test,

SC03 FE = fuel economy in mile per gallon over the SC03 test.

Hybrid gasoline-electric vehicles tested over a 4-bag 75 °F FTP will substitute the fuel economy over Bag 4 for Bag 2 in the appropriate places in the above equation (except in the case of the cold FTP, where hybrids, like conventional vehicles, will run a 3-bag test). The resulting equation for hybrid vehicles thus becomes:

$$0.82 \times \left[\frac{0.48}{\text{Bag } 4_{75} \text{ FE}} + \frac{0.41}{\text{Bag } 3_{75} \text{ FE}} + \frac{0.11}{\text{US06 City FE}} \right] + 0.18 \times \left[\frac{0.5}{\text{Bag } 2_{20} \text{ FE}} + \frac{0.5}{\text{Bag } 3_{20} \text{ FE}} \right]$$
$$+ 0.133 \times 1.083 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{0.61}{\text{Bag } 3_{75} \text{ FE}} + \frac{0.39}{\text{Bag } 4_{75} \text{ FE}} \right) \right]$$

Under the vehicle-specific 5-cycle formula, the highway fuel economy value would be calculated as follows:

$$\text{Highway FE} = 0.905 \times \frac{1}{\text{Start FC} + \text{Running FC}}$$

Where:

$$\text{Start FC (gallons per mile)} = 0.330 \times \left(\frac{(0.76 \times \text{Start Fuel}_{75} + 0.24 \times \text{Start Fuel}_{20})}{60} \right)$$

and,

$$\text{Running FC} = (1.007) \times \left[\frac{0.79}{\text{US06 Highway FE}} + \frac{0.21}{\text{HFET FE}} \right] + 0.133 \times 0.377 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{0.61}{\text{Bag } 3_{75} \text{ FE}} + \frac{0.39}{\text{Bag} 2_{75} \text{ FE}} \right) \right]$$

where the various symbols have the same definitions as described under the formula for the vehicle-specific 5-cycle city fuel economy value.

For hybrid gasoline-electric vehicles tested over a 4-bag 75 °F FTP the highway fuel economy is calculated using the following equations:

$$\text{Highway FE} = 0.905 \times \frac{1}{(\text{Start FC} + \text{Running FC})}$$

Where:

$$\text{Start FC} = 0.33 \times \left(\frac{(0.76 \times \text{Start Fuel}_{75} + 0.24 \times \text{Start Fuel}_{20})}{60} \right)$$

Where:

$$\text{Start Fuel}_{75} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{75}} - \frac{1}{\text{Bag 3 FE}_{75}} \right] + 3.9 \times \left[\frac{1}{\text{Bag 2 FE}_{75}} - \frac{1}{\text{Bag 4 FE}_{75}} \right]$$

and,

$$\text{Start Fuel}_{20} = 3.6 \times \left(\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}} \right)$$

and,

$$\text{Running FC} = 1.007 \times \left[\frac{0.79}{\text{US06 Highway FE}} + \frac{0.21}{\text{HFET FE}} \right] + 0.133 \times 0.377 \times \left[\frac{1}{\text{SC0 3 FE}} - \left(\frac{0.61}{\text{Bag } 3_{75} \text{ FE}} + \frac{0.39}{\text{Bag } 4_{75} \text{ FE}} \right) \right]$$

Where:

US06 Highway FE = fuel economy in miles per gallon over the Highway portion of the US06 test,

HFET FE = fuel economy in miles per gallon over the HFET test,

SC03 FE = fuel economy in miles per gallon over the SC03 test.

Additional equations are necessary in the unusual cases where a manufacturer test a hybrid gasoline-electric vehicle using a 2-bag FTP; these equations are detailed in the Technical Support Document.

B. Derivation of the MPG-Based Methodology

Although the 5-cycle vehicle-specific method will be optionally available to manufacturers starting with the 2008 model year, it is the mpg-based approach that will be more widely utilized for the 2008 through 2010 model years. Starting with the 2011 model year the mpg-based approach may continue to be used where test data demonstrates that the 5-cycle method is unlikely to produce significantly different results. The mpg-based method applies an adjustment to a vehicle's FTP or HFET test result based on that vehicle's measured fuel economy on the FTP or HFET.

The mpg-based adjustments were developed from applying the 5-cycle formulae to fuel economy data from 615 recent model year vehicles and determining the average relationship between the 5-cycle city and highway fuel economy values and FTP and HFET fuel economy values. Thus, because the data used to develop the average adjustments were derived from 5-cycle fuel economies, the mpg-based adjustments include the effect of high speeds, aggressive driving, air conditioning, and colder temperatures. However, they do so based on the impact of these factors on the average vehicle and do not reflect the fuel economy actually achieved during these types of driving by individual vehicles, which is the case with the 5-cycle formulae. As indicated by a comparison of the fuel economy label values developed using the mpg-based and 5-cycle approaches (see Figures II–1 and II–2), these ''fleet-average'' adjustments are reasonably accurate for most vehicles.

For example, for vehicles with FTP fuel economy ranging from 20 to 30 mpg, the mpg-based approach will adjust the FTP fuel economy result downward by 20–22 percent (*i.e.*, by 4 to 7 mpg), versus today's 10 percent downward adjustment. Thus, city fuel economy label values under the mpg-based approach will tend to be about 10–12 percent lower than today's label values. For vehicles with HFET fuel economy in the range of 25 to 35 mpg the mpg-based approach on average will adjust the HFET fuel economy downward by 28 percent (*i.e.*, by 7 to 10 mpg), versus today's 22 percent downward adjustment. Thus, highway fuel economy label values under the mpg-based approach will tend to be about 8 percent lower than today's label values.

The characteristics of the mpg-based equations can be seen in Figures II–1 and II–2 below. The 5-cycle fuel economies for 615 recent model year vehicles are represented by the individual data points on the charts. Hybrid vehicles are represented by large squares on the charts. The mpg-based fuel economy curve, represented by the regression line on the chart, was developed from these data. The horizontal axis is the measured FTP fuel economy.

Under the mpg-based approach, the city fuel economy value will be calculated as follows:

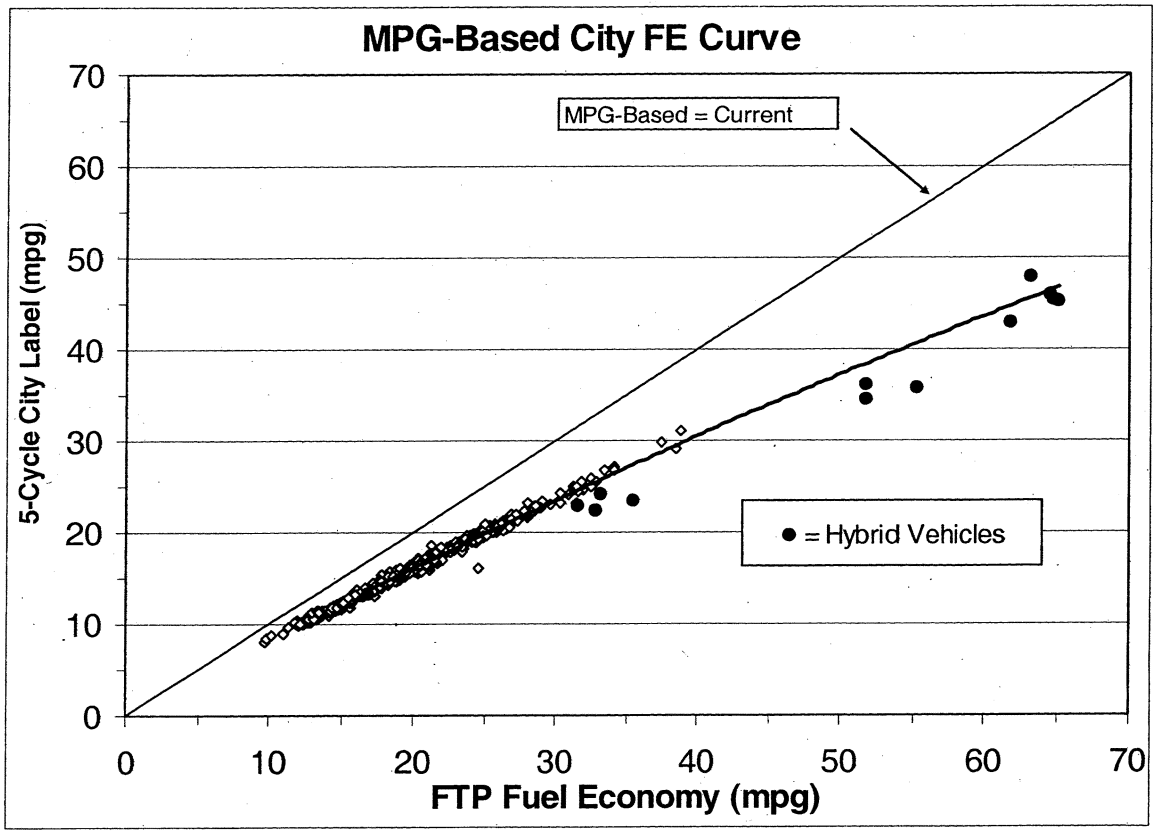
Equation 1:

$$\text{City MPG} = \frac{1}{\left(0.003259 + \frac{1.1805}{\text{FTP FE}} \right)}$$

Where:

FTP FE = the fuel economy in miles per gallon of fuel during the FTP test conducted at an ambient temperature of 75°F. This value is normally a sales-weighted average of the vehicle models included in the ''model type'' vehicle grouping as defined in 40 CFR 600.002–93.

Figure II-1: MPG-Based City Fuel Economy



Likewise, the highway fuel economy value will be calculated as follows:

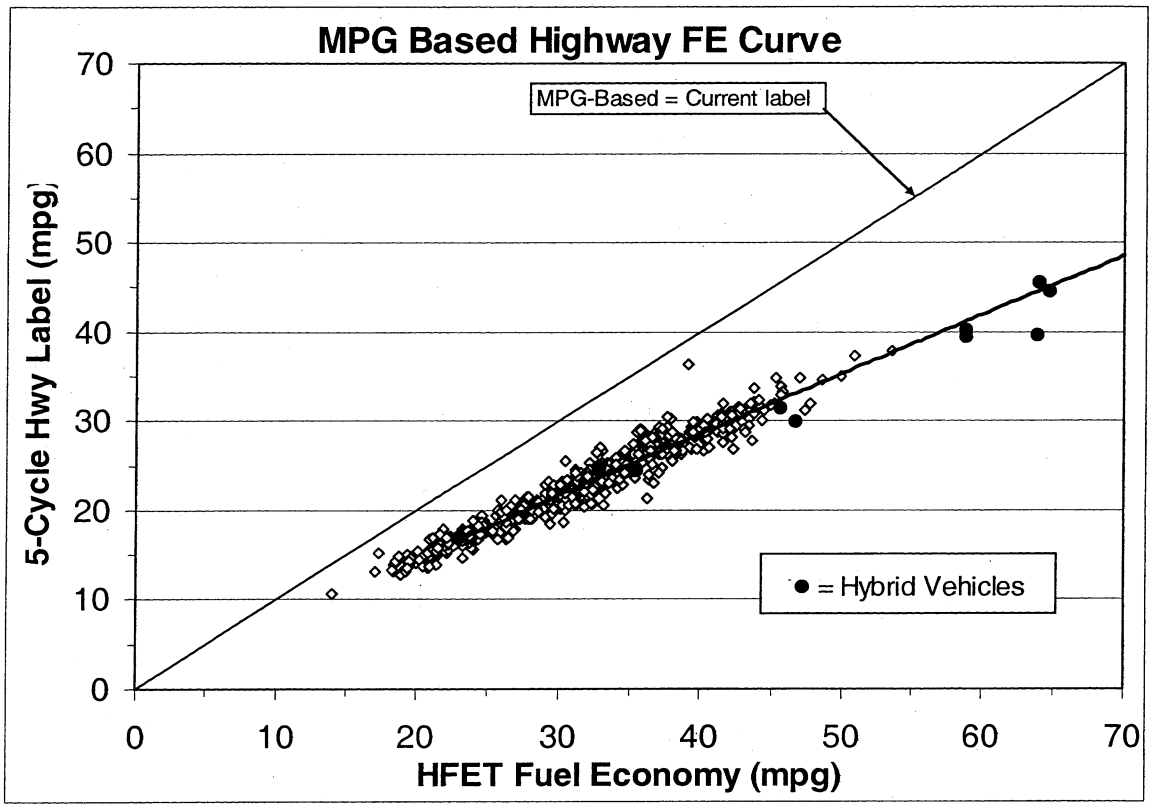
Equation 2:

$$\text{Highway MPG} = \frac{1}{\left(0.001376 + \frac{1.3466}{\text{HFET FE}}\right)}$$

Where:

HFET FE = fuel economy in mile per gallon over the HFET test. This value is normally a sales-weighted average of the vehicle models included in the ''model type'' vehicle grouping as defined in 40 CFR 600.002–93.

Figure II-2: MPG-Based Highway Fuel Economy



These equations differ from those that we proposed in two ways. First, as described above, we have modified the 5-cycle fuel economy formulae slightly based on additional information received since the proposal. Second, we have added 192 additional vehicles to our 5-cycle fuel economy database. The mpg-based equations developed for the proposal were based on 5-cycle fuel economy estimates for 423 2003 to 2005 model year vehicles, whereas the mpg-based equations shown above were based on 5-cycle fuel economy estimates for 615 2003 to 2006 model year vehicles. The net effect of these two changes is that the city and highway fuel economy adjustments to the FTP and HFET fuel economy values are a few percent smaller than those based on the proposed mpg-based equations.

As mentioned above, the mpg-based equations were developed from the 5-cycle fuel economy estimates for 615 2003–2006 model year vehicles. In order to keep the mpg-based equations up-to-date and reflecting changes in vehicle technology, EPA will update these equations periodically using the same methodology, but no more frequently than on an annual basis. We will update the mpg-based equations periodically, especially if we determine that doing so would significantly change the label results, using all of the available 5-cycle fuel economy estimates for the previous three or more model years. These revised mpg-based equations will be issued through the publication of an EPA guidance document. The final regulations contain the equations that are applicable to 2008 model year vehicles, as well as the components of the equations to be utilized for future model year vehicles.

We plan to update the mpg-based curves periodically using all of the available 5-cycle fuel economy estimates for the previous three or more model years. We proposed that these revised mpg-based equations would be issued through the publication of an EPA guidance document which would be released by January 1 of the calendar year prior to the model year to which the equations first apply. We suggested in the proposal that this meant, for example, that mpg equations for the 2012 year would be published prior to January 1 of 2011. However, we now recognize that the model year for many manufacturers can begin almost a full year before the start of the identically-named calendar year (*i.e.*, the 2012 model year can begin on January 2, 2011). Manufacturers commented that issuing guidance applicable to a given model year potentially mere days or weeks from the start of that model year for some vehicle lines did not provide adequate lead time. We agree, and we are finalizing regulations that require EPA to issue guidance regarding revisions to the equations by no later than July 1 of the calendar year prior to the earliest start of the model year that starts in the following calendar year. In other words, for new equations to be applicable to the 2010 model year (which can begin as early as January 2, 2009), EPA must issue guidance prior to July 1, 2008.

C. Effect of the New Methods on Fuel Economy Label Values

The impact of the new methodology on city and highway fuel economy label values was assessed using the same database of 615 recent model year vehicles used to develop the mpg-based adjustments discussed above. It is important to realize that these are projections based on historical data, and that the actual impacts on fuel economy label values will be dependent upon how a given vehicle performs over the specific tests. Figures II–3 and II–4 show, for city and highway fuel economy, respectively, how the label values would change under the 5-cycle

method for each vehicle in the 615-vehicle database. Figures II–5 and II–6 show, for city and highway fuel economy, respectively, the distributions of the percent change in label values relative to the current labels. More than 90 percent of the vehicles would have new city label values that are from 8 to 15 percent lower than their current label values. Figure II–3 also shows that the new city label values for most hybrid vehicles will be between 20 and 30 percent lower than today's city label values. Figure II–4 shows that about 90 percent of the vehicles in the database, including most hybrids, would have new highway label estimates that are from 5 to 15 percent lower than today's current highway estimates. Under the current method all vehicles would receive the same adjustment to account for the variety of factors now accounted for by the new methodology. Under the 5-cycle method vehicles receive differing ''adjustments'' relative to the current label values based on each vehicle's response to the five tests. Table II–1 presents the average results of this comparison for all 615 vehicles, as well as various sub-sets of vehicles.

Figure II-3: Change in City Fuel Economy: 5-Cycle vs. Current Label Values

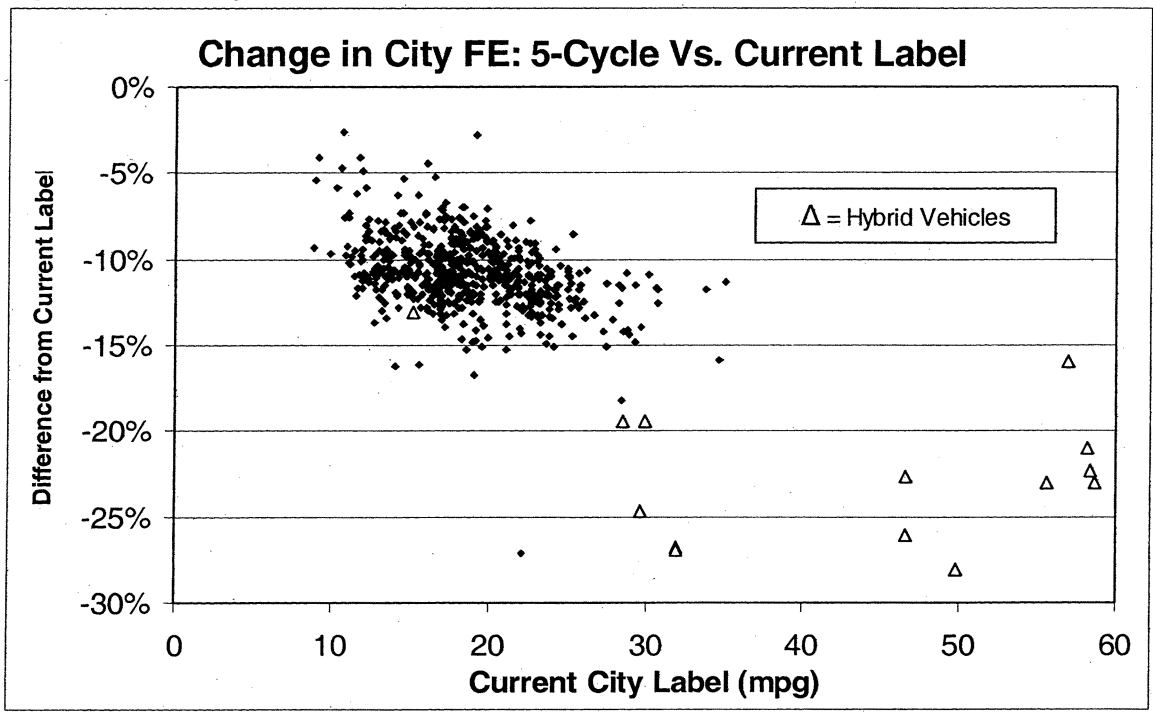


Figure II-4: Change in Highway Fuel Economy: 5-Cycle vs. Current Label Values

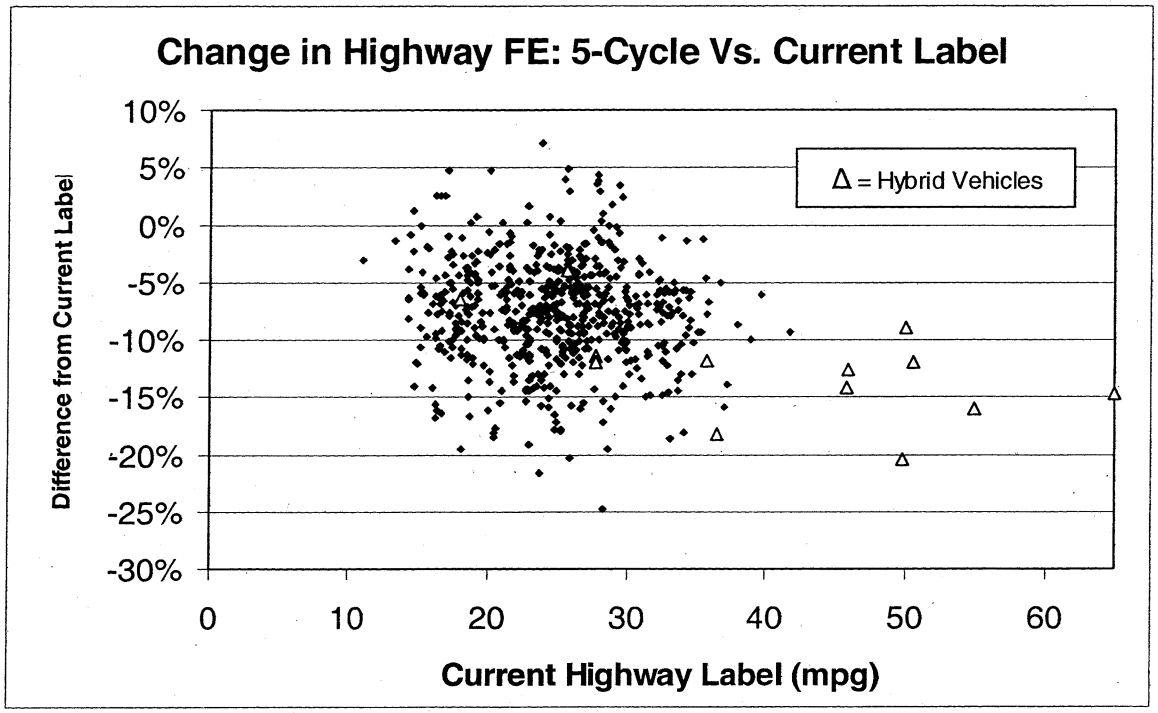


Figure II-5: Change in City Fuel Economy: Distribution of Percent Change in City Label Values

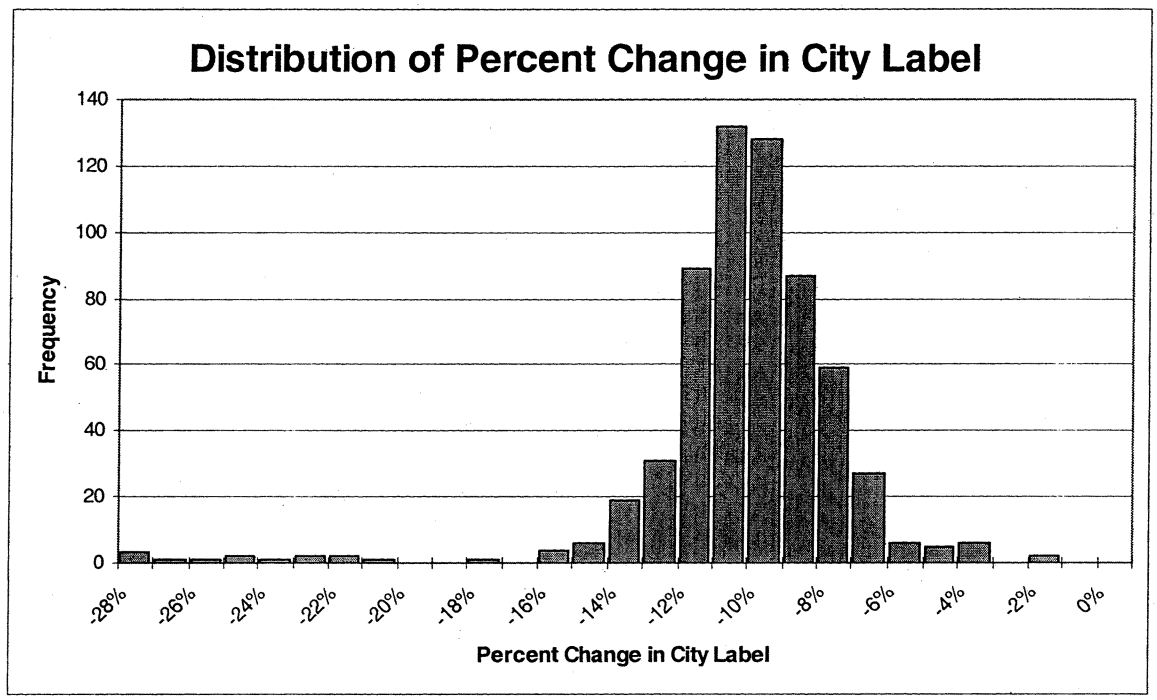


Figure II-6: Change in Highway Fuel Economy: Distribution of Percent Change in Highway Label Values

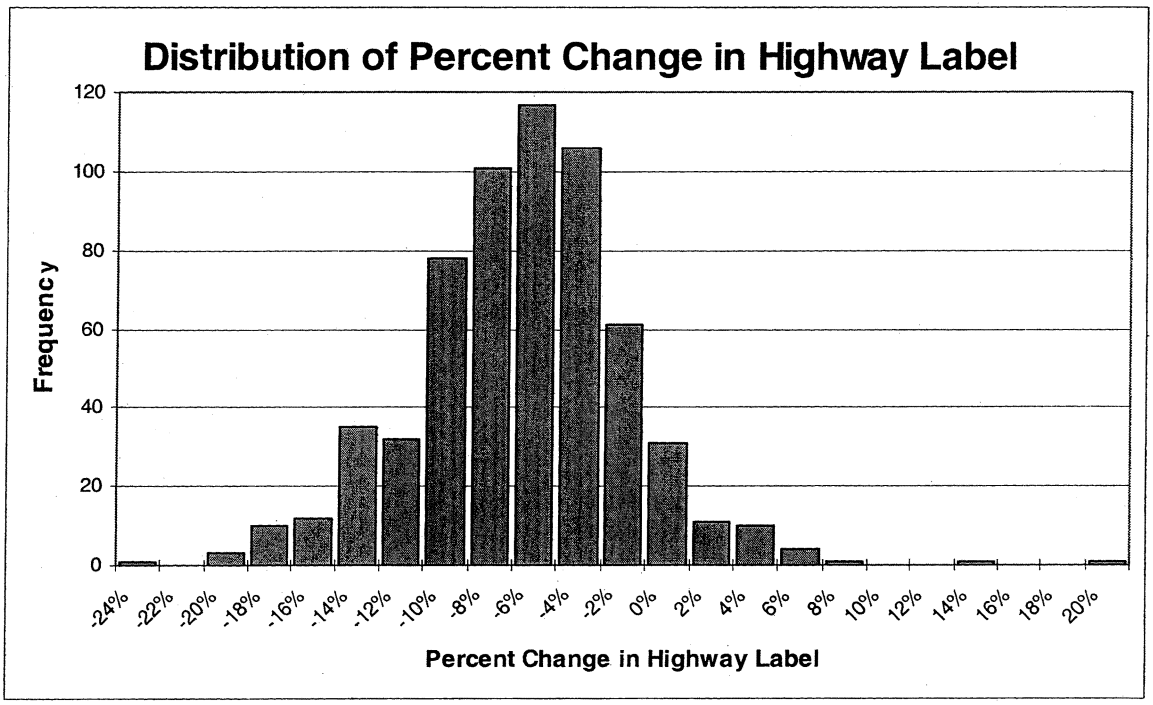


TABLE II–1.—EFFECT OF 5-CYCLE FORMULAE ON CITY AND HIGHWAY FUEL ECONOMY LABELS

	City			Highway			Combined*		
	Current (mpg)	5-Cycle (mpg)	Percent change (percent)	Current (mpg)	5-Cycle (mpg)	Percent change (percent)	Current (mpg)	5-Cycle (mpg)	Percent change (percent)
Hybrids	42.7	33.0	−22.3	42.8	36.9	−12.9	42.6	35.0	−17.1
Diesel (1 vehicle)	26.2	23.4	−10.7	35.3	32.0	−9.3	29.6	27.6	−6.7
Conventional Vehicles									
12 Highest FE	30.9	26.9	−12.9	36.6	34.0	−6.9	33.2	30.5	−8.0
12 Lowest FE	10.2	9.5	−6.9	14.8	14.8	−0.2	11.9	11.9	0.4
Average	18.6	16.5	−10.8	24.6	22.8	−7.4	20.9	19.6	−6.0

*Combined fuel economy for Current MPG is based on weighting of 55%/45% city/highway, respectively. Combined fuel economy for 5-cycle MPG is based on weighting of 43%/57% city/highway, respectively (discussed further in Chapter II.C of the Technical Support Document).

As can be seen from Table II–1, use of the 5-cycle formulae will reduce both current city and highway fuel economy label values. For conventional vehicles, city and highway fuel economy values will be reduced an average of 10.8 percent and 7.4 percent, respectively. The reduction in city fuel economy label values for conventional vehicles with higher than average fuel economy will be slightly higher than average (−12.9%), while the reduction for conventional vehicles with lower than average fuel economy will typically be slightly lower than average (−6.9%). The reduction in highway fuel economy for conventional vehicles varies less around the average in the same way that it does for city fuel economy. Vehicles with higher than average fuel economy will typically experience a reduction in the highway label value similar to all conventional vehicles, while vehicles with lower than average fuel economy at the other end of the spectrum will, on average, see little to no change in their highway label value (or possibly a modest increase in some cases). Again, this is explained by each vehicle's fuel economy response to the new test cycles, and some vehicles are more sensitive to the new test conditions than others.

The impact on hybrid vehicles will be greater, averaging a 22.3 percent reduction for city fuel economy and 12.9 percent for highway fuel economy.[29] This greater impact occurs primarily because a number of the fuel efficient aspects of hybrid vehicles produce their maximum benefit under conditions akin to the FTP and HFET tests, and are somewhat less beneficial during aggressive driving, colder ambient temperatures and when the air conditioner is turned on. However, these vehicles will still remain among the top fuel economy vehicles.

There is one diesel vehicle in our 5-cycle fuel economy database. The

[29] The database of 615 vehicles includes 14 hybrid vehicles. All the hybrid models available as of the 2006 model year are represented in the database: Honda Insight, Honda Civic, Honda Accord, Toyota Prius, Toyota Highlander/Lexus RX400h, Ford Escape/Mercury Mariner, and Chevrolet Silverado/GMC Sierra pickup truck.

impact of the 5-cycle formulae on this one diesel is very similar to that for the average conventional, gasoline-fueled vehicle.

The impact of the mpg-based formulae will be very similar on average to those shown in Table II–1 above for conventional vehicles. This is not surprising, since the mpg-based formulae are based essentially on the average results of the 5-cycle formulae. However, the mpg-based formulae will increase the city fuel economy of hybrid vehicles slightly, as indicated in Table II–2. This occurs because there are only 14 hybrid vehicles in the database, compared to 601 gasoline-fueled, conventional vehicles. The mpg-based regression of city fuel economy, therefore, represents essentially the impact of the 5-cycle formulae on conventional vehicles, which is less than that for hybrids. The mpg-based regression of highway fuel economy is essentially the same for conventional and hybrid vehicles.

TABLE II–2.—EFFECT OF MPG-BASED FORMULAE ON CONVENTIONAL AND HYBRID FUEL ECONOMY

	City			Highway		
	Current (mpg)	MPG-based (mpg)	Percent change (percent)	Current (mpg)	MPG-based (mpg)	Percent change (percent)
Conventional	18.6	16.5	−10.9	24.6	22.7	−7.8
Hybrids	42.7	35.1	−16.7	42.8	38.4	−9.8

Table II–3 summarizes the projected impact of the new methods (5-cycle and mpg-based) relative to the current label values of the 615 vehicle database.

TABLE II–3.—EFFECT OF NEW METHODS ON FUEL ECONOMY ESTIMATES

	City fuel economy estimate			Highway fuel economy estimate		
	Current	5-Cycle	MPG-based	Current	5-Cycle	MPG-based
Conventional Vehicles:						
MPG	18.6	16.5	16.5	24.6	22.8	22.7
Percent Change		−10.8%	−10.9%		−7.4%	−7.8%
Hybrid Vehicles:						
MPG	42.7	32.4	35.1	42.8	36.7	38.4
Percent Change		−23.6%	−16.7%		−13.2%	−9.8%

In addition to looking at the overall change in fuel economy estimates for all vehicles in the database, we also focused on those manufacturers responsible for the majority of sales in the U.S. This approach may better reflect the changes likely to be seen by the majority of consumers. In effect, Table II–3 above includes vehicles by Aston Martin and Rolls-Royce in the percent change, and these vehicles are weighted equally with cars made by GM, Ford, DaimlerChrysler, and other top-selling manufacturers. According to Autodata Corporation, the seven manufacturers with the greatest U.S. market share account for more than 90 percent of U.S. sales. Table II–4 shows these manufacturers, their 2005 U.S. market share, and the average percent change in city and highway fuel economy estimates for each of these manufacturers as represented in our database. As can be seen in the table, the city mpg estimates for these manufacturers will drop by about 12 percent on average relative to today's estimates, and highway estimates will drop by about 8 percent on average. It is important to note, however, that these estimates are not intended to represent or include the entirety of a manufacturer's product line, and should not be interpreted as such. These estimates are derived from our database of 615 test vehicles for which data on all five emission and fuel economy test procedures is available, and because of differing ways in which manufacturers test their vehicles and submit data to EPA, the database may not reflect the range of makes and models similarly across manufacturers.[30]

TABLE II.–4.—EFFECT OF NEW METHODS ON FUEL ECONOMY ESTIMATES FOR MAJOR MANUFACTURERS

Manufacturer	2005 U.S. market share (percent)*	Average change in city fuel economy estimate (percent)	Average change in highway fuel economy estimate (percent)
General Motors	25.9	−10	−11
Ford Motor Co.	17.9	−12	−10
DaimlerChrysler	14.9	−10	−11
Toyota	13.7	−11	−7
Honda	8.9	−13	−7

[30] The database spreadsheet is available in the public docket for review.

TABLE II.–4.—EFFECT OF NEW METHODS ON FUEL ECONOMY ESTIMATES FOR MAJOR MANUFACTURERS—Continued

Manufacturer	2005 U.S. market share (percent)*	Average change in city fuel economy estimate (percent)	Average change in highway fuel economy estimate (percent)
Nissan	6.1	−11	−7
Hyundai	2.9	−13	−8
Average		−12	−8

* Source: Autodata Corp., Woodcliff Lake, New Jersey.

D. Comparison to Other Onroad Fuel Economy Estimates

In the proposal, we compared fuel economy label values based on the current, mpg-based, and 5-cycle formulae to estimates of onroad fuel economy developed by a number of organizations. In the short time since the proposal, little new data has become available. Also, as described above, we are finalizing only minor changes to the proposed mpg-based and 5-cycle formulae. Thus, overall, the relative comparisons described in the proposal remain largely unchanged. We describe these generally below, and refer the reader to Chapter II of the Technical Support Document for a detailed description of these comparisons.

We begin with a comparison of 5-cycle fuel economy values with the fleetwide fuel economy estimates developed by the Federal Highway Administration (FHWA). There are several differences in these two estimates. First, we do not have fuel economy data for all vehicles sold over the past 20–30 years over all five test procedures. Therefore, we cannot develop a 5-cycle fuel economy estimate for the current onroad fleet directly. Instead, we compare 5-cycle fuel economy values to the current label values for the vehicles for which we have 5-cycle fuel economy data, and then extrapolate this relationship to the rest of the vehicle fleet. Also, the FHWA light truck class includes vehicles above 8,500 pound GVWR. The fuel economy estimated for this class therefore requires adjustment to be comparable to EPA's light-duty truck class. We also make this comparison for cars and light trucks combined, in order to avoid differences in the ways that FHWA categorizes vehicles.

Since the NPRM, FHWA has published onroad fuel economy estimates for the 2004 vehicle fleet and updated their estimates for 2003. FHWA's estimates of light truck fuel economy onroad are almost 20 percent lower than their previous estimate for the 2002–2003 fleets. After adjusting for the difference in light truck categories, FHWA data indicate that combined car and light truck fuel economy averaged 19.7–19.9 mpg during 2003 and 2004. Extrapolating the fuel economy label estimates from the 615 vehicles in our certification database to the entire fleet produces an average combined fuel economy of 19.9 mpg. This close match-up is not surprising, given that the value of the factor representing effects not simulated during the dynamometer tests (e.g., wind, road grade, etc.) was set using the FHWA estimates of onroad fuel economy.

Next, several governmental and non-governmental organizations perform their own fuel economy assessments. Of these, the American Automobile Association (AAA) and Consumer Report have tested the greatest number of vehicles. Oak Ridge National Laboratory (ORNL) has recently begun a program where drivers can submit their own fuel economy measurements via the Internet. Argonne National Laboratory (ANL) has also been operating an extensive hybrid demonstration project for a few years as part of DOE's Freedom Car project.

Each of these estimates of onroad fuel economy has their relative strengths and weaknesses. The strengths of the non-governmental organization testing include the fact that the vehicles are tested on actual roads, usually in traffic and under real environmental conditions. The primary weaknesses of this testing are:

(1) The driving patterns involved are not typically published, so they may or may not be representative of average U.S. driving,

(2) Vehicles are tested throughout the year, so some vehicles are tested in hot weather and others in cold weather, and some under moderate conditions, thus leading to results that are not comparable across vehicles and that may not reflect average U.S. driving, and

(3) In some cases, the actual test procedures used to measure the volume of fuel consumed during the test are not described, leaving some doubt as to their accuracy. Still, because of the public interest in these estimates, we have compared them to our mpg-based and 5-cycle label estimates.

We updated our comparison of mpg-based and 5-cycle fuel economy estimates to Consumer Report's fuel economy estimates for 2000–2005 model year vehicles which were also in our 5-cycle database. We were also able to match 70 of these vehicles with those in our 5-cycle fuel economy database.[31] As in the NPRM, we focused on Consumer Report's combined fuel economy, which is a harmonic average of its fuel economy measurements for city driving, highway driving, and a 150-mile trip. On average, the mpg-based combined fuel economy values are 3 percent higher than those of Consumer Report, while the 5-cycle fuel economy values are 2% higher than those of Consumer Report. Thus, there is an excellent match between the composite mpg-based fuel economy and the Consumer Report combined fuel economy.

[31] In the NPRM, we identified 151 vehicles which were both tested by Consumer Reports and in our certification database. However, many of these matching vehicles were not from the same model year.

TABLE II–5.—CONSUMER REPORTS AND CURRENT EPA AND MPG-BASED FUEL ECONOMY: 303 VEHICLES

	Consumer reports	Current EPA label		MPG-based	
	MPG	MPG	Difference* (percent)	MPG	Difference (percent)
City	14.2	20.4	−30	18.0	−21
Highway	29.3	26.9	9	24.7	19
Combined	20.7	22.9	−9	21.2	−3

Table II–6 presents the same comparisons, except that it includes the 5-cycle estimates and only includes the 70 matched vehicles.

TABLE II–6.—CR AND CURRENT EPA, 5-CYCLE AND MPG-BASED FUEL ECONOMY: 70 VEHICLES

	Consumer reports	Current EPA label		5-cycle		MPG-based	
	MPG	MPG	Difference* (percent)	MPG	Difference (percent)	MPG	Difference (percent)
City	14.3	20.4	−30	18.0	−21	17.8	−20
Highway	29.3	26.4	11	24.3	21	24.1	22
Combined	20.6	22.7	−9	21.0	−2	20.9	−2

We also updated our comparison to onroad fuel economy as estimated by AAA.[32] We were able to match 61 out of the 163 vehicles from their 2004 report to vehicles in our 5-cycle certification database. This is lower than the 98 models which we matched in the analysis described in the NPRM due to the use of a more stringent criterion that the vehicles match in terms of model year. As AAA only develops a single fuel economy estimate for each vehicle (i.e., no separate city or highway estimates), we compared their estimates to combined fuel economy values using the mpg-based and 5-cycle formulae. On average, the mpg-based combined fuel economy values exceeded those of AAA by 6.7%, while the 5-cycle fuel economy values exceeded those of AAA by 6.1%.

We obtained a recent compilation of consumer's onroad fuel economy estimates which have been submitted to the Oak Ridge National Laboratory's ''Your MPG'' database. Unlike Consumer Report and AAA, drivers submit their own estimates of onroad fuel economy and city/highway driving split to the YourMPG Web site. The strength of this type of data is the fact that the vehicle is being operated by the owner or regular driver in typical use. The weaknesses are the unknown representativeness of the sample, the unknown nature of the technique used by the owner/driver to measure fuel economy and the unknown time period over which fuel economy is generally assessed (e.g., a couple of tanks full or the past year). The database now contains 8180 estimates of fuel economy for 4192 vehicles, compared to 2544 estimates of fuel economy for 1794 vehicles at the time of the NPRM. The database does not provide sufficiently precise vehicle descriptions to match vehicles to those in our 5-cycle database. Thus, we limit our comparison to the mpg-based method. We combined the mpg-based city and highway label values using each driver's estimate of the percentage of their driving that was in city or highway conditions. If a driver did not provide an estimate of the breakdown of their driving pattern, we assumed that their driving was 43 percent city and 57 percent highway in terms of miles driven (not time driven).

Diesels appear to perform better onroad than gasoline vehicles compared to their current or mpg-based label values. Onroad fuel economy by diesels in the YourMPG database exceeded the current label combined label values by 4.3 percent. In contrast, conventional gasoline vehicles fell short of their current combined label values by 1.4 percent.

TABLE II–7. —YOURMPG VERSUS CURRENT AND MPG-BASED LABEL FUEL ECONOMY

Vehicle type	Number of estimates	YourMPG	Current label	Difference (percent)	MPG-based label	Difference (percent)
Conventional gasoline	7330	23.8	24.1	−1.4	21.7	9.1
High MPG Conventional Gasoline*	680	35.1	35.8	−1.7	31.6	11.2
Hybrid Gasoline	520	43.2	47.1	−8.2	40.5	6.3
Diesel	221	41.8	40.1	4.3	35.3	18.3

* Combined EPA Label fuel economy value of 32 mpg or greater, representing about the top 10% fuel economy conventional vehicles.

We also performed similar comparisons of EPA label and various onroad fuel economy estimates focusing specifically on hybrids and high fuel economy conventional vehicles. In the NPRM, we did this analysis for hybrids. However, we received some comments that highlighting the impact on hybrid vehicles specifically was misleading. The reason given was that, if hybrids performed differently on the road compared to their label values, it was

[32] AAA Auto Guide: 2004 New Cars and Trucks. AAA Publishing, 2004.

due to their relatively high fuel economy and not because of their hybrid technology. However, we found that the relationship between mpg-based and 5-cycle label values and the onroad fuel economy estimates for conventional vehicles with relatively high fuel economy is consistently more similar to that of lower fuel economy conventional vehicles than to hybrids.

There is a significant degree of scatter in the various estimates of onroad hybrid fuel economy. Those from DOE's FreedomCar program, Consumer Report and Edmunds [33] tend to be much lower than those from YourMPG and AAA. EPA's Kansas City data, although not representative of the entire country, tends to fall in between these other two sets of onroad hybrid estimates. The 5-cycle combined label values tend to be in line with the lower set of estimates. The mpg-based label values tend to be somewhat higher than the lower set of estimates, but well below those of YourMPG and AAA. As described in the NPRM, the fuel economy of hybrids is more sensitive to driving patterns and ambient conditions than conventional vehicles. The scatter in the various onroad fuel economy estimates for hybrids likely reflects this fact, as each estimate is based on a unique set of driving activity and ambient conditions.

Overall, the mpg-based and 5-cycle fuel economy label values compare favorably with estimates of onroad fuel economy made by other organizations. However, lack of detailed knowledge of the driving conditions and test procedures behind many of the latter estimates prevents systematic comparisons, especially involving individual weighting factors in the 5-cycle formulae.

E. Implementation of the New Fuel Economy Methods

1. 5-Cycle Vehicle Selection Criteria for 2011 and Later Model Years

In addition to finalizing the mpg-based adjustments for the 2008–2010 model years, as mentioned above, we are finalizing as proposed selection criteria for the continued use of this method for 2011 and later model years. These criteria will indicate for a given vehicle test group whether the full 5-cycle testing would result in significantly different fuel economy label values than the mpg-based approach. If not, then those vehicles could use the mpg-based method rather than the 5-cycle method. This approach is designed to avoid additional test burden where the fuel economy label values would not be significantly different under the 5-cycle method.

Each year, manufacturers must demonstrate compliance with federal emission standards by performing tests over all five test procedures. The vehicles on which these tests are performed are known as ''emission data vehicles'', which are selected to represent the ''worst-case'' emitting vehicle in a group of vehicles, known as a ''test group'', which share common engine and emission control designs.[34] EPA issues certificates of emission conformity for each test group of vehicles in each model year. Thus, for each test group, there exists a set of official certification test data from all five test cycles—FTP, HFET, US06, SC03 and Cold FTP. The fuel economy measured from these official certification tests can be inserted into the 5-cycle city and highway formulae to determine city and highway fuel economy values. Since FTP and HFET testing is included in the official certification data, the mpg-based city and highway fuel economy values can also be determined. Thus, for each emission data vehicle, the 5-cycle city and highway fuel economy values then can be compared to the mpg-based city and highway fuel economy values. We believe that it is reasonable to allow continued use of the mpg-based line when the available 5-cycle fuel economy data (from emissions certification) indicates that the mpg-based fuel economy determined from the official FTP and HFET tests performed for the test group are similar enough to the 5-cycle fuel economy determined from the official FTP, HFET, US06, SC03 and Cold FTP tests for that same test group. In that case, the manufacturer can use the mpg-based method for all model types covered under the EPA certificate of conformity that is represented by the 5-cycle data submitted to represent those vehicles. The manufacturer will not need to conduct 5-cycle testing for fuel economy labeling for these model types.

To accomplish this, we defined the lower bound of a tolerance band around the mpg-based line as the criteria for whether the mpg-based line could be used or whether 5-cycle testing would be required for further vehicle models within a test group. As proposed, we are finalizing four and five percent as the tolerance bands for the city and highway mpg lines, respectively. Mathematically, the tolerance line is defined by Y x mpg-based fuel economy, where Y is 0.96 for city fuel economy and 0.95 for highway fuel economy. In other words, if the 5-cycle city fuel economy value is greater than or equal to 0.96 times the mpg-based city fuel economy, all the vehicle model types covered under the certificate of conformity for that test group are eligible to use the mpg-based method to determine both city and highway fuel economy label estimates. Similarly, when the 5-cycle highway fuel economy is greater than or equal to 0.95 times the mpg-based highway fuel economy, all vehicle model types covered under the certificate of conformity in that test group are required to use the vehicle-specific 5-cycle approach. This can be done using analytically derived fuel economy estimates, when appropriate. This approach is appropriate because those vehicles with a 5-cycle value above the mpg-based line that used the mpg-based line would simply be reducing their fuel economy down to the average level, even though the 5-cycle data indicated better than average performance was likely for that vehicle group. Because of the better-than-average performance, we expect that most manufacturers will want to do complete 5-cycle testing for vehicles likely to be significantly above the mpg-based line.

This approach is illustrated in the Figures II–7 and II–8, below. The black squares in these figures represent situations where the mpg line does not do a good job (based on the tolerance criteria as shown by the dashed line) of predicting the 5-cycle fuel economy. Those vehicles with black squares in the two charts below may not use the mpg-based approach, but instead must perform additional testing to achieve better fuel economy estimates. Note that these charts do not show the entire range of FTP and HFET fuel economy on the x-axis, and thus do not show all those vehicles ''passing'' or ''failing'' the city or highway criteria. For the purpose of illustrating this concept it helps to isolate the FTP range from 20 to 30 mpg and the HFET range from 30 to 40 mpg.

[33] See *www.edmunds.com.*

[34] The ''emission data vehicle'' is the test vehicle chosen to represent a ''test group'' for emission certification purposes. A ''test group'' is made up of vehicles that share common combustion cycle, engine type, fuel type, fuel metering system, catalyst construction and precious metal content, engine displacement, number and arrangement of cylinders, and emission standards. The emission data vehicle is required to be the vehicle within the test group that is expected to be worst-case for exhaust emissions. In general the criteria that cause the emission data vehicle to be worst-case for emissions will also cause it to be worst-case for fuel economy (e.g., it will be the heaviest vehicle in the test group, with an automatic transmission, four-wheel drive, etc.). In general, the FTP, HFET, US06 and SC03 are performed on the emission data vehicle to demonstrate that the test group complies with the federal emission standards. The Cold FTP is performed on the worst-case vehicle within a durability group, which represents a larger group of vehicles, including those covered in the test group.

Figure II-7: MPG-Based City Fuel Economy Line Showing 4% Tolerance Criteria

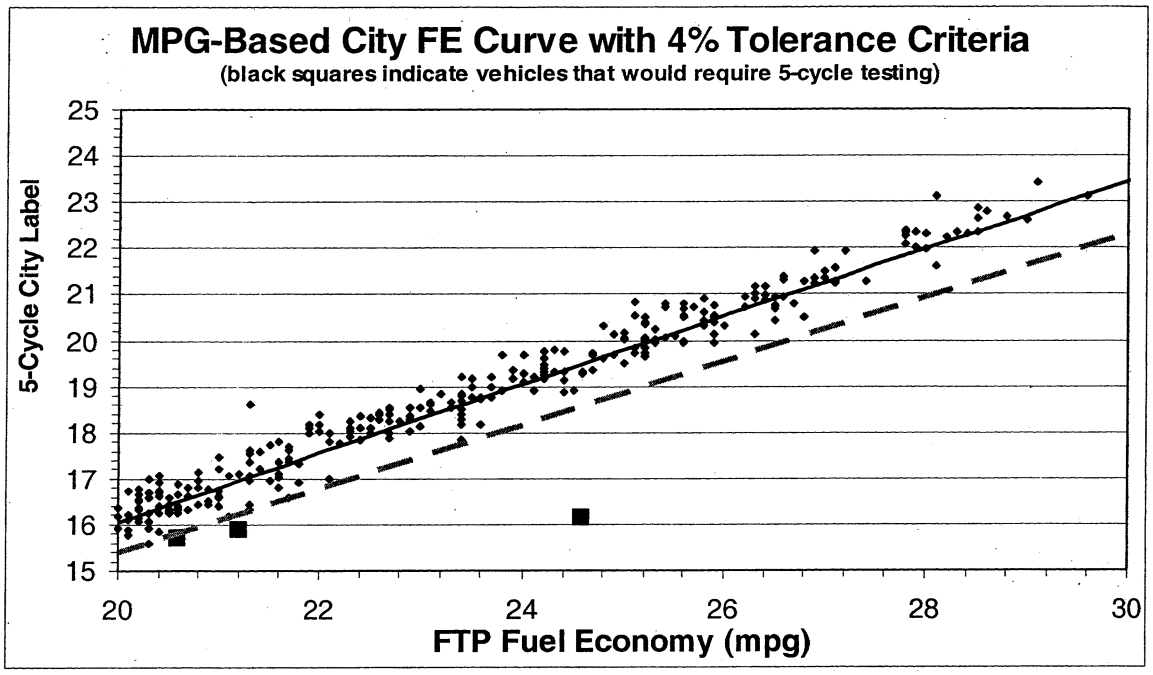
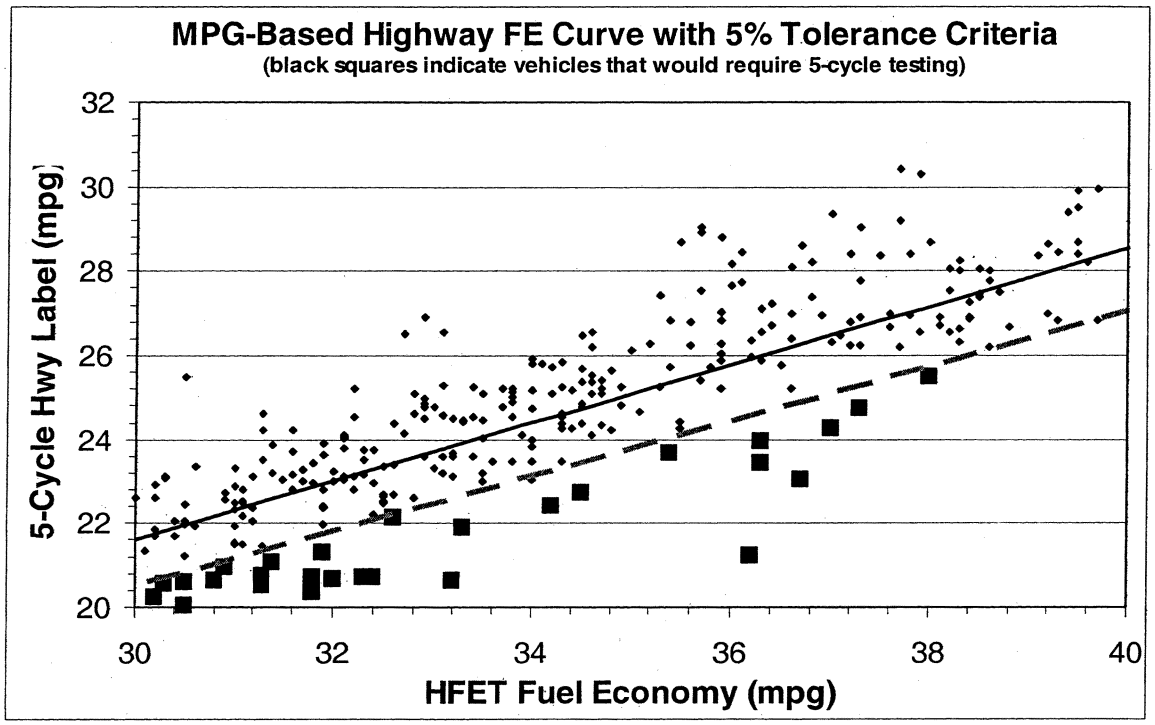


Figure II-8: MPG-Based Highway Fuel Economy Line Showing 5% Tolerance Criteria



If the 5-cycle city fuel economy falls below the mpg-based city fuel economy by more than four percent (i.e., below the tolerance line), but the 5-cycle highway fuel economy does not fall below the mpg-based highway fuel economy by more than five percent (i.e., above the tolerance line), all the vehicle configurations represented by the emission data vehicle are required to use the vehicle-specific 5-cycle approach for both city and highway fuel economy, since fuel economy values for all five cycles are important in estimating 5-cycle city fuel economy. However, if the 5-cycle highway fuel economy is less than the mpg-based highway fuel economy by more than five percent (i.e., below the tolerance line), but the 5-cycle city fuel economy is not more than four percent lower than the mpg-based city fuel economy (i.e., above the tolerance line), all the vehicle configurations represented by the emission data vehicle will use the mpg-based approach to estimate the city fuel economy label. For the highway label in

this case, all the vehicle configurations represented by the emission data vehicle may use an approximate 5-cycle formula. This formula includes vehicle-specific fuel economy measurements for the FTP, HFET and US06 tests, but the SC03 and cold FTP test values may be estimated based on relationships developed from other vehicles. This is appropriate because the impact of the cold FTP test on highway fuel economy in the 5-cycle formula is not vehicle-specific, but estimated (or modeled) based on known relationships. Also the impact of the SC03 test on highway fuel economy is very small, particularly compared to that for the US06 test.

The criteria for use of the mpg-based approach in model year 2011 and later (5-cycle city fuel economy above four percent and 5-cycle highway fuel economy above five percent) are based on the balance of three factors. First, we designed them to be sufficiently large so that typical test-to-test variability would not cause a test group to fail the criteria. This may be a greater concern for the highway fuel economy comparison, due to the dominance of the US06 fuel economy (which inherently has greater test-to-test variability than the other tests) in the 5-cycle formula. Second, we want to minimize the potential error in the fuel economy label. Label fuel economy values are rounded to the nearest whole mpg. Thus, we felt it important to keep the difference between the 5-cycle and mpg-based fuel economy values within roughly one mpg, if possible. In other words, if the difference between the two methods is less than 1 mpg, then the two methods would produce the same label value. If the difference is more than 1 mpg then we would expect the 5-cycle method to result in a different label value, and thus it is more important to trigger the requirement for additional testing. Third, we want to avoid requiring additional fuel economy testing that will have little to no impact on the label values.

The four percent tolerance band for city fuel economy is equivalent to roughly 0.6–0.7 mpg on average. Due to the contribution of a number of independent fuel economy measurements in the 5-cycle city formula, the effect of test to test variability should be much lower than four percent. Based on the 5-cycle test results of 615 recent model year vehicles, we estimate that about 96 percent of test groups would fall above the four percent tolerance line. Thus, we believe that this criterion adequately satisfies the three factors mentioned above.

The five percent tolerance band for highway fuel economy is equivalent to roughly 1.1 mpg on average. Thus, it is slightly higher than the typical error associated with rounding. However, due to the dominant contribution of the US06 fuel economy in the 5-cycle highway formula, and the fact that this test tends to have relatively high variability, we are concerned that test-to-test variability could be on the order of 3.0 percent in the 5-cycle highway formula. We estimate that about 87 percent of test groups would fall above the five percent tolerance line. Thus, again, we believe that this criterion adequately satisfies the three factors mentioned above.

Overall, allowing the continued use of the mpg-based approach in this way will reduce the number of additional SC03 and cold FTP tests by about 96 percent and reduce the number of additional US06 tests by about 87 percent. Moreover, this significant reduction in test burden is achieved with no significant impact on the fuel economy estimate.

2. Medium-Duty Passenger Vehicle Label Estimates

As noted in Section I, we are finalizing in this rule a fuel economy labeling program for Medium-Duty Passenger Vehicles (MDPVs), a subset of vehicles between 8,500 and 10,000 lbs GVWR. MDPVs were first defined in the regulation that put in place the ''Tier 2'' emission standards.[35] This newly-defined class of vehicles includes SUVs and passenger vans between 8,500 and 10,000 lbs GVWR, but excludes large pick-up trucks. The specific regulatory definition was designed to capture in the Tier 2 vehicle emissions program those vehicles that are designed predominantly for passenger use.[36]

Under the Energy Policy and Conservation Act (EPCA), EPA is required to establish regulations that require a manufacturer to attach a label to each ''automobile'' manufactured in a model year.[37] ''Automobile'' is defined as a vehicle not more than 6,000 lbs GVWR, and those vehicles between 6,000 and 10,000 lbs GVWR that DOT determines are appropriate for inclusion in the CAFE program.[38] ''Automobile'' for the purposes of labeling also includes vehicles at no more than 8,500 lbs GVWR whether or not DOT has included those vehicles in the CAFE program.[39] EPA has no authority to require labels on vehicles that are not automobiles, therefore EPA has no authority to require labeling of either vehicles above 10,000 lbs GVWR, or vehicles between 8,500 and 10,000 lbs GVWR that are not included by DOT in the CAFE program.

Since the time of EPA's proposal, DOT has included some vehicles above 8,500 lbs GVWR and below 10,000 lbs in its CAFE program, beginning in model year 2011.[40] Since these vehicles now meet the definition of automobile, EPA is authorized to include these vehicles in the labeling program. EPA is now requiring fuel economy labels on MDPVs (as defined in the CAFE program), beginning with model year 2011.

MDPVs are currently subject to emission standards that apply on the existing Federal Test Procedure, and many also undergo emission testing on the current Highway Fuel Economy Test due to requirements in California. Beginning with the 2011 model year, manufacturers will be routinely testing MDPVs over the FTP and the HFET tests in order to comply with the CAFE program. However, MDPVs are not today subject to all of the additional emission tests we are utilizing for the 5-cycle method.[41] Specifically, MDPVs are not subject to the 1996 SFTP regulations.[42] The SFTP regulations include the US06 and SC03 test procedures, both of which are necessary elements of the 5-cycle fuel economy methodology. These two test cycles represent high speed and aggressive driving (US06), and impacts of air conditioner operation (SC03). We do not believe it is appropriate to require SFTP testing for MDPVs for fuel economy purposes alone, but we are not prepared at this time to establish SFTP standards

[35] See 65 FR 6698 (Feb. 10, 2000).

[36] This is the regulatory definition of Medium-Duty Passenger Vehicle, found in 40 CFR 86.1803–01: Medium-duty passenger vehicle (MDPV) means any heavy-duty vehicle (as defined in this subpart) with a gross vehicle weight rating (GVWR) of less than 10,000 pounds that is designed primarily for the transportation of persons. The MDPV definition does not include any vehicle which:

(1) Is an ''incomplete truck'' as defined in this subpart; or

(2) Has a seating capacity of more than 12 persons; or

(3) Is designed for more than 9 persons in seating rearward of the driver's seat; or

(4) Is equipped with an open cargo area (for example, a pick-up truck box or bed) of 72.0 inches in interior length or more. A covered box not readily accessible from the passenger compartment will be considered an open cargo area for purposes of this definition.

[37] See 49 U.S.C. 32908(b).

[38] See 49 U.S.C. 32901(a)(3).

[39] See 49 U.S.C. 32908(a).

[40] See 71 FR 17565 (April 6, 2006).

[41] MDPVs are currently required under the Tier 2 program to meet a carbon monoxide standard on the cold FTP test; compliance with this standard is being phased in over the 2008 and 2009 model years.

[42] See 61 FR 54852 (Oct. 22, 1996).

for MDPVs. In the Tier 2 regulations, we acknowledged that MDPVs were not covered by SFTP requirements, and we specifically noted that SFTP emission standards would be addressed in a future regulation.[43] We believe that the appropriate time to consider 5-cycle fuel economy testing for MDPVs is during or after development of appropriate SFTP emission standards for MDPVs. We plan to address SFTP emission standards for MDPVs in the near future. At that time, we will also assess the appropriateness of 5-cycle fuel economy testing for MDPVs. However, we are finalizing a program that requires MDPVs to use the mpg-based adjustments to calculate fuel economy estimates. The database of 615 vehicles used to generate the mpg-based adjustments includes vehicles similar in many respects to existing MDPVs, with similar FTP and HFET fuel economy as measured today. For example, the database includes models of the Chevrolet Suburban below 8,500 lbs GVWR, which are very similar to the versions of the same vehicle that is above 8,500 lbs GVWR and classified as an MDPV. Additionally, because the mpg-based adjustment is essentially the average relationship between FTP and HFET fuel economy and 5-cycle fuel economy results, we believe that the resulting label values for MDPVs will be an adequate representation. The mpg-based approach does not require testing beyond what will be required to meet the CAFE program in model year 2011. Manufacturers will simply take their FTP and HFET test results (conducted for the CAFE program) and apply them to the mpg-based equation to determine their fuel economy label values.

3. Analytically Derived Fuel Economy

When a vehicle is required to generate data from all five test cycles, there are multiple ways for the manufacturer to accomplish this. One way would be to perform the three additional tests—the US06, SC03, and cold FTP tests (the FTP and HFET would be performed under current and future requirements). The other way is to estimate fuel economy values over the US06, SC03 and cold FTP tests analytically (i.e., analytically derived fuel economy, or ADFE) from testing of a similar vehicle over these three cycles. Under this method, manufacturers will be allowed to estimate the effect of differences in inertia test weight, road load horsepower, and N/V ratio (the ratio of engine revolutions to vehicle speed when the vehicle is in its highest gear) on fuel economy, and use these estimates to calculate predicted fuel economy over the three new fuel economy test cycles. A procedure to estimate the effect of these three vehicle parameters on FTP and HFET fuel economy has already been developed.[44] We plan to work with manufacturers to appropriately analytically derive fuel economy for the US06, SC03 and cold FTP tests, or otherwise utilize data for these tests already available from certification vehicles. We will implement these estimation procedures using agency guidance, as is currently done for FTP and HFET fuel economy.

III. Revisions to the Fuel Economy Label Format and Content

A. Background

We proposed to update the design of the fuel economy label to better convey its information to the public. We took comment on four alternative label designs. We received overwhelming public support for revamping the label and numerous constructive comments for enhancing the final label content. Based on these public comments, we developed additional alternatives for how information might be presented on the label. We gauged consumer reaction to these alternatives by conducting a series of focus groups in five cities across the country. These groups provided valuable feedback which we used to establish the final label. The docket to this rule includes the final report entitled ''Fuel Economy Focus Groups—Phase Two Findings'' that contains details about the focus groups.

The label format and content we are finalizing today reflects input from the public comments and focus group research. The modern design of this label more effectively communicates fuel economy estimates and related information to the customer. Section I of this preamble provides a graphic of the new fuel economy label and key considerations that went into developing its final design. This section presents the specific elements on the final label.

We plan to conduct public outreach and education to increase consumer awareness of the new label's design and content. We believe that we can increase consumer comprehension by jointly-sponsoring an outreach campaign with car dealers and other interested stakeholders that could include explanatory materials, such as a brochure that dealers could distribute to customers.

B. Label Size and Orientation

Although we proposed to maintain the label's size at 7 inches by 4.5 inches, we experimented with its orientation. Two of the four alternative labels proposed were positioned vertically (portrait), and two horizontally (landscape) as today's label. Public comments highly supported one of the vertically oriented versions (identified in the proposed rule as ''Alternative 4.''[45] The commenters that provided reasons for this preference indicated that the new look, along with the graphically presented comparison information, helped convey the fuel economy information desired by the customer, discussed further in Section III.C below.

Some automakers expressed concerns with the vertical label orientation. Their primary apprehension was that the new Department of Transportation—National Highway Traffic Safety Administration safety rating label, required on price stickers (''Monroney'' label) of all cars produced on or after September 1, 2007,[46] competes for space with the fuel economy label. Some manufacturers had already redesigned their price stickers to accommodate the safety rating label beside a horizontally positioned fuel economy label. These companies stated that because the price sticker contains a great deal of information, changing the fuel economy label orientation would be difficult from a graphic design standpoint. One manufacturer commented that it had already printed stock price stickers containing horizontally oriented fuel economy labels and would bear an added cost of redesigning and reprinting the stickers if EPA required the vertical label.

To consider further the above comment, we tested both horizontal and vertical versions of the label (Figure III–1) with the focus groups. While the focus groups expressed a slight preference for the vertical orientation, this preference was not strongly held. Some participants remarked that the vertical label was easier to read ''top to bottom''; however, a contrasting observation made in many of the focus groups was that on the vertical label the text within the gray area of the fuel pump was more difficult to read. [Insert photo Figure III–1: Preliminary vertical

[43] See 65 FR 6789 (Feb. 10, 2000).

[44] U.S. EPA Memorandum ''Updated Analytically Derived Fuel Economy (ADFE) Policy for 2005 MY and Later,'' CCD–04–06 (LDVLDT), March 11, 2004. Available in the public docket for review.

[45] Note that the NPRM contained four label alternatives, printed in the Appendix to the proposed regulations on pages 5510–5513, labeled Alternative 1, 2, 3, and 4. These same labels were posted on EPA's Web site, but in a slightly different order and with different nomenclature (Label A, B, C, and D). In the following discussion we refer to the labels printed in the NPRM and use that nomenclature.

[46] See 71 FR 53572 (Sept. 12, 2006).

and horizontal designs for focus group review.]

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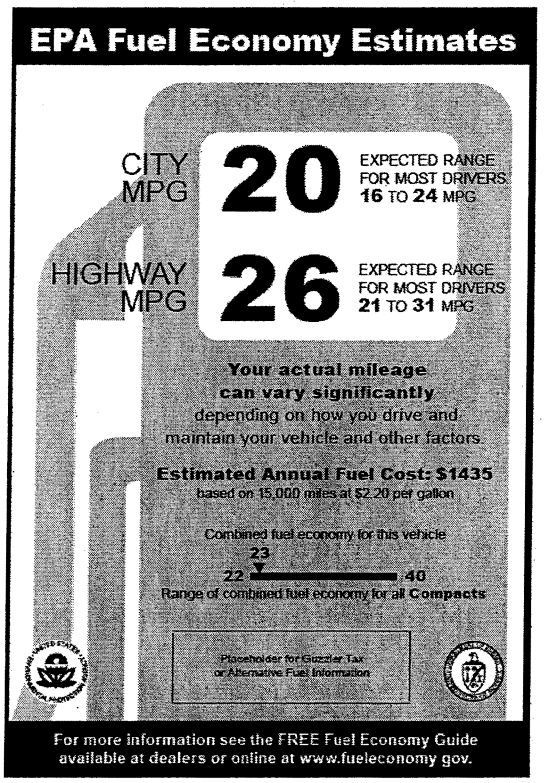
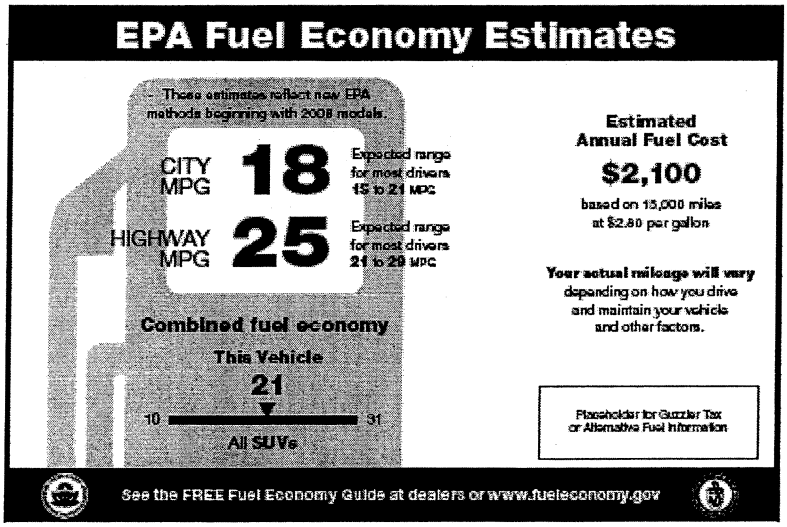
Figure III-1: Preliminary vertical and horizontal designs for focus group review.





BILLING CODE 6560–50–C

Although public comments indicated a preference for the vertical orientation, the primary reasons given were more relevant to the design elements (particularly the gray ''watermark'' fuel pump design with information it its ''window'' and the bar graphic showing comparable fuel economy) rather than the label orientation itself. Therefore, in order to address both the consumers' needs and the automakers' concerns, our final label contains the new design elements supported by public comments and its appearance is oriented horizontally. The label size remains unchanged from the current label, at 7″ wide by 4.5″ high, and the final layout incorporates several important changes

to improve legibility and consumers' understanding of the label information.

C. Fuel Economy of Comparable Vehicles

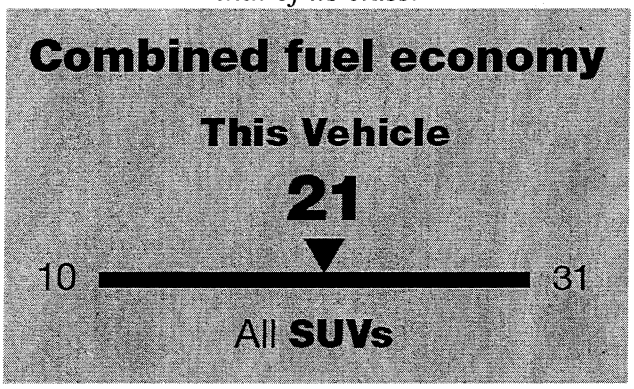
We proposed two contrasting depictions comparing a particular vehicle's fuel economy to that of all other vehicles in its class: a text statement and a graphic depiction (Figure III–2). On three of the proposed labels, we specified separate city and highway comparable fuel economy information on the bottom half of the label in a text statement, similar to the current label. On one of the vertically oriented labels (Alternative 4) we proposed a graphical bar scale that indicated where the vehicle's combined fuel economy would fall compared to all other vehicles in its class.

Figure III-2: Proposed options for comparing fuel economy with other vehicles.

Option #1 – Text statement of fuel economy information of a particular vehicle to that of its class

For comparison shopping, the range of fuel Economy for all **Sport Utility Vehicles** is **15** to **30** MPG city and **20** to **40** MPG highway.

Option #2 – Graphical representation of fuel economy information of a particular vehicle that of its class.



Public commenters strongly favored the graphical version, many noting that it was similar to the Federal Trade Commission's EnergyGuide ratings placed on new appliances.

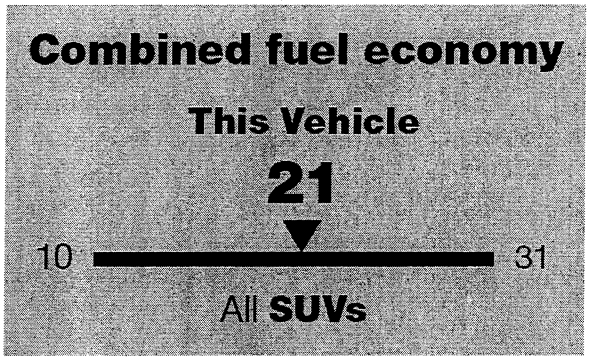
One industry comment suggested that the graphical way of presenting comparable fuel economy highlighted a weakness in the comparable vehicle class designations. Automakers expressed concern that ''the graphic representation may portray a significant volume of sales as having low fuel economy, even though many consumers would be shopping in only subgroups of EPA's classes.'' They recommended that EPA retain its current text portrayal of comparable fuel economy, but if significant comments were to favor the graphic design, they asked to work with EPA and through additional focus groups to develop a design that addresses their competitive concerns. Although their concerns were directed at the graphic, the underlying issue is EPA's comparable class designations. A separate discussion of comparable classes is in Section VI.F.

We also tested these representations of comparable fuel economy with the focus groups and they responded positively to the graphic version of combined fuel economy. Participants indicated that they were more likely to use this information, since it was much more clearly displayed in the graphical version. Many participants commented further that the range of combined fuel economy was more useful than the city/highway ranges of the verbal text.

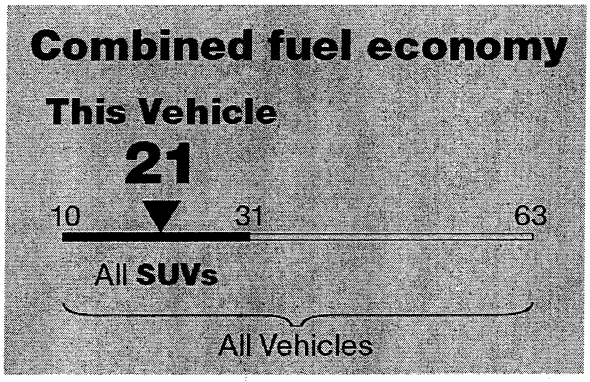
One commenter stated that the within-class graphic did not provide enough context for consumers because many people do not shop within a single class, but instead may be simultaneously considering a variety of types of vehicles (for example, SUVs or minivans). The commenter suggested an alternate version of this graphic containing a bar scale that represents the fuel economy range of all vehicles, with the range of the specific vehicle class embedded in the overall range. We tested this alternative with the focus groups, along with an enhanced graphic, similar to the one proposed in the Alternative 4 label. These alternatives are shown in Figure III–3.

Figure III-3: Fuel economy comparison options tested with focus groups

Option 1: Within-Class Range of Vehicles
Graphical presentation of a particular vehicle's estimated fuel economy compared to that of its class.



Option 2: Added Range of All Vehicles
Graphical presentation of a particular vehicle's estimated fuel economy compared to that of its class and of all fleet vehicles.



The focus groups slightly preferred Option 1 because of its simplicity, many participants noting that they already knew which class of vehicles they would be considering. Others preferring Option 2 mentioned that it could influence some people to reconsider vehicles with higher fuel economy. Although some participants thought the added fuel economy range in Option 2 was useful, many thought it was too much information or were confused by what it represents.

Because public comment and focus group reaction has been positive, we are finalizing a comparable fuel economy graphic similar to Option 1 (Figure III–3). This graphic shows the range of fuel economy for the comparable class of vehicles and indicates where the specific vehicle falls on that range. The focus groups comprehended it easily at a glance, an important consideration given how briefly most viewers look at the labels on dealer lots. We recognize that the added information provided by revealing the fuel economy range of all vehicles may be valuable to some, but because of clarity and ease of comprehension, we are finalizing the simpler within-class graphic. Those desiring more detailed information about comparable fuel economy can find it on the Fuel Economy Guide and at *http://www.fueleconomy.gov*, referenced at the bottom of the label.

D. Estimated Annual Fuel Cost

We proposed to elevate the visibility of the estimated annual fuel cost information by increasing its size and location on the label (Figure III–4, Option 1). Additionally, we proposed to include further information on which the estimated annual fuel costs are determined—specifically the number of miles driven per year and the price of fuel per gallon. (This information is currently optional on the label, but manufacturers typically do not include it). Public commenters and focus group participants responded favorably to these changes.

One commenter suggested that a single cost estimate would not match most drivers' experiences, and that a cost range would be more valuable for those who drove more exclusively under city or highway conditions. To explore this comment, we developed an option that showed three separate fuel cost estimates (Figure III–4, Option 2):

(1) Combined estimate based on a mix of city and highway driving;

(2) City estimate based on all city driving; and

(3) Highway estimate based on all highway driving.

Both options were tested with the focus groups.

Figure III-4: Estimated Annual Fuel Cost Options

Option 1: Proposed fuel cost info
Presentation of Estimated Annual Fuel Cost based on only the combined city/highway driving scenario.

Estimated Annual Fuel Cost

$2,100

based on 15,000 miles
at $2.80 per gallon

Option 2: Added city and highway fuel cost info
Presentation of Estimated Annual Fuel Cost based on combined city/highway driving, city-only driving, and highway-only driving scenarios

Estimated Annual Fuel Cost

Combined: **$2,100**

City $2,333
Highway $1,680

based on 15,000 miles
at $2.80 per gallon

The focus groups had mixed reactions to these options, but slightly preferred Option 1 because it was simpler and provided all of the vital information. Others thought that the combined estimate would be more accurate, since they did not drive exclusively in either city or highway conditions. Alternatively, those that preferred seeing the added city/highway fuel costs did so because they did drive under one condition more often than another; others simply preferred having more information.

We are finalizing Option 1 based on positive response from both public commenters and focus groups. While the option to include separate city and highway annual fuel costs may provide additional useful information for some consumers, others may disregard it altogether because of its complexity. Furthermore, there is enough information provided on the simpler graphic that a person could determine their own customized fuel cost estimate by modifying one or more parameters (*e.g.* mpg, dollars-per-gallon, or miles-per-year).

As explained in further detail in Section III.I, the estimated annual fuel cost is determined using a weighted combination of estimated city and highway fuel economy values. Currently the combined fuel economy is based on a weighting of 55% city mpg and 45% highway mpg. We proposed changing the weighting to 43% city mpg and 57% highway mpg, but as discussed in Section III.I we are not finalizing this as proposed, choosing instead to retain the 55/45 weighting factors.

E. "Your mileage will vary" Statement

We proposed to include a statement on the label stating, "Your actual mileage can vary significantly depending on how you drive and maintain your vehicle and other factors." This statement reinforces to customers that the mpg values are estimates only and that drivers will experience different fuel economy depending on many factors. Most commenters favored some sort of disclaimer statement and provided a number of suggestions. Some proposed that the statement both highlight the inexact nature of the estimate and educate consumers on which factors may lead to improved fuel economy. Others suggested that the statement distinguish between factors that drivers could and could not control. We tested three alternative versions with the focus groups: a slight modification to the proposed version, one having a list of fuel economy tips, and the other simply pointing to a Web site where one could find the tips. These are shown in Figure III–5.

Figure III-5: "Mileage will vary"statement options

Option 1 Proposed "Mileage will vary"statement	**Your actual mileage will vary** depending on how you drive and maintain your vehicle and other factors.
Option 2 "Mileage will vary"statement with details	**Your actual mileage will vary.** For best mileage avoid high speeds and rapid acceleration, keep tires properly inflated and reduce air conditioning.
Option 3 "Mileage will vary"statement with web link and no details	**Your actual mileage will vary.** For tips on improving your fuel economy see www.fueleconomy.gov.

The focus group reaction was divided uniformly between the three options provided. Some liked seeing the more-detailed tips, while others preferred the Web link, since the list of tips was incomplete. Some thought that fewer details coupled with a Web link would be appropriate.

All factors that impact fuel economy cannot be listed on the fuel economy label because they are too numerous. Our proposed statement was designed to capture two of the biggest categories that drivers can control: Driving style and vehicle maintenance, with a blanket ''and other factors'' clause added. ''How you drive'' covers such factors such as speed, acceleration, use of air conditioning, braking, and driving predominantly in either city or highway conditions. ''How you maintain your vehicle'' covers factors like tire pressure, oil changes, tune-ups, and other maintenance. Both of these categories include factors that the driver can control in most cases.

The focus groups generally thought that the ''other factors'' clause was unnecessary. To increase the likelihood that consumers will read and understand the message that fuel economy will vary, we believe that a simpler statement is preferable. We considered adding the Web address to the statement in order to reflect the desire within the focus groups for access to more detailed information. However, in designing the final label format, we realized that it would be redundant because it is located directly above the identical Web site that is provided at the bottom right border of the label. Therefore, we are finalizing a statement that states, ''Your actual mileage will vary depending on how you drive and maintain your vehicle,'' to be located near the Web address at the bottom of the label.

F. Environmental Information Statement

Historically, EPA has rated fuel economy and emissions from 0–10 on the Green Vehicle Guide Web site (*www.epa.gov/greenvehicles/*). We sought comment on allowing companies to voluntarily include EPA air pollution and/or greenhouse gas ratings on the fuel economy label. While auto manufacturers supported alerting consumers to these issues, they did not favor adding emissions ratings to the label, because they may dilute the fuel economy information. Another comment from the auto industry was that the emissions factors and weights associated with the ratings presented in the Green Vehicle Guide are subjective and debatable. Thus, they recommended that we continue to present environmental ratings on the web, where there is ample space for elaboration.

One environmental group did not support rating a vehicle's greenhouse gas emissions from 0–10 because the scale was ''too coarse,'' but recommended that we instead educate consumers on how their vehicle choice impacts the environment. Two different environmental groups favored mandating both greenhouse gas and smog scores on the label. One of these groups disagreed with the auto manufacturers, stating that there was ample space on the label to present the scores without interfering with fuel economy information. The other group further suggested that we compare these scores numerically and graphically to all vehicles, as in the NPRM, and that we include an official EPA ''Seal of Approval'' to the most environmentally benign vehicles. Because some comments suggested further improvements to our method for calculating these scores, and because a clear preference for how to present this information did not emerge from the comments, we are not finalizing provisions for including this information on the label at this time. We remain open to suggestions for a voluntary environmental labeling program that could be implemented in the future.

To further consider those comments suggesting that we instead educate consumers on the relation of fuel economy and environmental and societal issues, we tested the following ''environmental statement'' with the focus groups: ''Buying a vehicle with better fuel economy helps protect the environment and reduces dependence on oil.'' Focus groups were strongly divided on this statement. Some asserted that it was ''preachy'' and ''stating the obvious,'' while others argued that it was consistent with EPA's mission and, even if obvious, addressed a concern felt by most of the population.

We are finalizing a label design that does not incorporate an environmental statement. While we agree that it is important to make a connection between a vehicle's fuel efficiency and the environment, we agree with focus group comments that most consumers already recognize this relationship. Additionally, since most of the new label space is utilized by statutorily-required information, a practical concern was that we would not be able to add this statement without creating a ''fine print'' look. However, both the Fuel Economy Guide and the *www.fueleconomy.gov* Web site (referenced on the label) include details

about the impact of fuel economy on the environment, for consumers wishing to explore these issues further.

G. Government Logos and Web Site Link

We proposed to include prominent EPA and DOE logos on the label and a prominent reference to ''EPA'' on the label title. These changes reflect earlier market research indicating that people were unaware of the fuel economy estimates' origin, and that knowing the government was the source of this information added to its credibility. Since public commenters and focus groups responded favorably to this proposal, the final label design includes the government logos at the bottom and ''EPA Fuel Economy Estimates'' in the title.

We also proposed to require placement of the jointly-sponsored EPA–DOE Web site *www.fueleconomy.gov* on the label. Since commenters and focus group members reacted positively to adding a web link, we are finalizing this requirement.

H. Temporary Transitional Statement

We asked commenters if the label should include transitional language indicating that the estimates are based on new methods. Such a statement could help customers understand why the fuel economy estimates are lower, especially when 2007 models having current fuel economy estimates are on dealer lots with 2008 models having new estimates. Commenters generally responded positively. Automakers suggested a brief statement, while another commenter suggested slightly longer wording. We tested the following transitional statement with the focus groups: ''These estimates reflect new EPA methods beginning with 2008 models.'' The meaning of this sentence was generally clear to the groups. A few participants wondered what the ''new EPA methods'' were, but determined after some discussion that the Web site provided on the label may give further explanation. We are finalizing this transitional statement for inclusion on the final fuel economy label.

We asked the groups how long this statement should be retained, and responses varied widely, from one year to the duration of an average consumer's vehicle purchase cycle. We believe that the transitional statement should be used while both the old and the new label formats appear simultaneously on vehicles on dealer lots. When all vehicles on the lot have labels with the new format (estimates based on new methods), there will be less potential for confusion. By the time 2010 models can be offered for sale (as early as January 2, 2009), all new vehicles on dealer lots will have the new label format and the transitional statement will no longer be necessary. Therefore, we are requiring the transition statement on the labels of all 2008 and 2009 model year vehicles.

I. Combined Fuel Economy Basis

For calculating the combined fuel economy displayed on the label (and also factored into the estimated annual fuel cost calculation), we proposed a weighting of 43% city and 57% highway. Currently this value is based on a 55% city/45% highway weighting. The 43/57 weighting was based on the new 5-cycle method and reflects average miles driven (not time spent) at speeds below and above 45 mph respectively, based on existing data for on-road driving patterns. This analysis is detailed in the Technical Support Document. We received comments that the 43/57 split was not intuitive to most drivers and that consumers may think more in terms of the percent of time they spend driving in city or highway conditions, rather than in percent of *distance* traveled. Some commenters suggested a simple 50/50 split, which is more intuitive to car buyers; others suggested retaining the 55/45 split since it is closer to the intuitive 50/50 split.

The basis for the 43/57 city-highway weighting as used to assess 5-cycle fuel economy fleetwide is discussed in the Technical Support Document. The issue for the label is how best to convey the fuel economy information most relevant to consumers and which city/highway weighting supports that purpose.

We agree with the comments that a 43/57 split based on distance is not intuitive to consumers. We considered the suggested 50/50 split, since likely most consumers think of ''combined'' fuel economy as an equal mix of city and highway driving. The 55/45 split was used historically to determine combined fuel economy since it is consistent with the statutory requirements for determining fuel economy for CAFE standards and the Gas Guzzler tax.[47] Thus, since it will remain the required weighting for the Gas Guzzler tax that appears on the label for applicable vehicles, it is most consistent to continue using the 55/45 split for combined fuel economy as well. We do not want to cause consumer confusion by using different city/highway weightings to calculate different numbers appearing on the label. Therefore, we are finalizing that a 55/45 weighting be used to calculate the combined fuel economy displayed on the label and used to calculate the estimated annual fuel costs. This decision does not impact the underlying city/highway split used analytically to determine fleetwide composite 5-cycle fuel economy, as discussed in the Technical Support Document.

J. Labeling Requirements for Dual Fueled Vehicles

Flexible-fueled vehicles (FFVs) (also called dual-fueled or bi-fueled vehicles) are vehicles that can operate either on gasoline or diesel fuel, or on an alternative fuel such as ethanol or methanol. Currently, for FFVs, manufacturers may voluntarily include the fuel economy estimates (and estimated annual fuel costs) for the alternative fuel on the label. This is part of the EPCA statute which requires that for dual fueled vehicles, the label must:

''(A) indicate the fuel economy of the automobile when operated on gasoline or diesel fuel;

(B) clearly identify the automobile as a dual fueled automobile;

(C) clearly identify the fuels on which the automobile may be operated; and

(D) contain a statement informing the consumer that the additional information required by subsection (c)(2) of this section is published and distributed by the Secretary of Energy.''[48]

The current labeling requirements for dual-fueled vehicles are consistent with these EPCA requirements. We did not propose changes to these requirements, and we did not seek comment on the topic. However, EPA received a late public comment from several environmental and consumer groups urging EPA to require manufacturers to include for FFVs the fuel economy and estimated annual fuel costs of both gasoline and E85 (mixture of 85% ethanol and 15% gasoline).

Historically, the EPA did not require fuel economy on the label for ethanol FFVs, because a vast majority of these vehicles operated on gasoline only, since ethanol was not widely available, and many owners were unaware they were driving an FFV. However, in recent months there has been a sharp increase in national interest in alternatives to fossil-based fuels, flexible-fueled vehicles, and ethanol in particular. With increased awareness and availability of these vehicles, the late comment suggested that the label be required to not only display separate gasoline and E85 fuel economy and annual cost estimates, but also to provide EPA smog and greenhouse gas

[47] See 49 U.S.C. 32904(c) and 26 U.S.C. 4064(c)(1).

[48] See, 49 U.S.C. 32908(c)(3).

scores and the ratio of ethanol to gasoline (which is not always 85:15) on the label. These additions would help alert customers that although the fuel economy of dual fuel models may be lower than gasoline-only models, they are still reducing environmental impact by using alcohol fuel.

Since we did not request comments on this topic, we are not finalizing requirements today that differ from the current regulations. However, we agree that it is important to provide consumers with complete fuel economy information on alternatively fueled vehicles, particularly in light of the rising sale of flex-fueled vehicles and a developing E85 fuel infrastructure. We agree that it is important for consumers to understand that fuel economy on E85 is typically about 20% to 30% lower than on gasoline, due to the lower energy density of E85.[49] Consumers can view the gasoline and E85 estimates of all FFVs in the Fuel Economy Guide and on the *www.fueleconomy.gov* Web site. We reiterate that manufacturers may voluntarily include the E85 (or other alternative fuel) mpg and estimated annual fuel costs on the label today, and we strongly encourage them to do so. The final label design includes a placeholder for such information.

We are not finalizing a requirement today, because we believe the issue (for manufacturers to display E85 fuel economy information on the label in addition to gasoline) deserves a more carefully considered approach. The label design we are finalizing was developed based on extensive public comments and focus group input. None of the options considered included E85 fuel economy information. Before requiring the inclusion of E85 fuel economy for FFVs, there are many questions we would consider for the design and placement of this information, such as: (1) How to clearly present E85 mpg relative to gasoline; (2) how to educate consumers that E85 helps reduce greenhouse gases and reduce oil consumption; (3) how to best convey estimated annual fuel costs of E85 (particularly given the volatility of E85 prices across the country), and (4) how to graphically depict comparable class fuel economy for E85 in addition to gasoline. In the next year, EPA will evaluate its legal authority to require manufacturers to include E85 fuel economy on the label. If we determine that we have statutory authority, we would then plan to work with interested stakeholders to assess how best to present E85 fuel economy information on the label. We welcome the input of stakeholders in this process, and we look forward to suggestions on how to best convey both the fuel economy and environmental benefit information on E85 relative to gasoline.

K. Addition of Final Regulatory Specifications for Label Content and Design

We proposed ''placeholder'' regulatory text that specifies the label content and design, knowing that the final label design would depend on the outcome of both the public comments and the focus group research. The final regulations contain the details for the format and content of the label.

IV. Testing Provisions

A. Testing Requirements for Vehicles Currently Exempt From Certain Emission Tests

Certain vehicles are currently exempt from some of the emission tests that we are including in the 5-cycle method.[50] These vehicles include diesel vehicles and alternative-fueled vehicles. In order to update the fuel economy methods for these vehicles, we proposed additional provisions and are finalizing them in this rulemaking.

1. Diesel Vehicles

Diesel fuel vehicles are not currently subject to Cold FTP emission standards and thus do not have a 20 °Fahrenheit (F) FTP (i.e., Cold FTP) fuel economy result to use in the 5-cycle formulae. Therefore, we proposed that beginning with the 2008 model year for certification diesel vehicles, a Cold FTP be performed for the purpose of collecting fuel economy data.

Accordingly, we also proposed and requested comments on winter-grade diesel fuel specifications for use during the Cold FTP test. Specifically, we proposed the use of a #1–D (winter-grade) diesel fuel as specified in ASTM D975–04c ''Standard Specification for Diesel Fuel Oils,''[51] and that complies with 40 CFR Part 80,[52] where the level of kerosene added shall not exceed 20 percent. We further proposed the use of a manufacturer-specified diesel fuel, with EPA approval, in lieu of a conventional diesel fuel under the alternate test procedure provisions in 40 CFR 86.113–94, where the level of kerosene added shall not exceed 20 percent. Since we did not receive any comments regarding the winter-grade diesel fuel specification, we are finalizing these provisions as proposed.

However, we did receive comments regarding requiring the Cold FTP for diesel vehicles. The auto industry cited the potential for major laboratory retrofitting, which required additional lead time, and suggested that EPA not require diesels to perform the Cold FTP until the 2011 model year. They further suggested that Cold FTP testing for diesels be optional in the 2008–2010 model years.

We have evaluated the comments regarding additional lead time for laboratory retrofitting to perform the Cold FTP test for diesel vehicles and believe they have merit. To accommodate Cold FTP testing of diesel vehicles, manufacturers may need to add a heated flame ionization detection (FID) system, including heated probes, lines and filters. Some manufacturers may need to further modify their facilities for site specific designs and configurations, such as additional insulation to prevent water condensation in the sampling system or modifying the length of the exhaust collection hoses.

As a result, we are changing the provisions for requiring Cold FTP diesel testing from the proposal, as follows. First, we are providing additional lead time by extending the requirement for Cold FTP diesel testing from the 2008 model year to the 2011 model year. This will allow manufacturers additional lead time to address any facility modifications. Second, we will not require the measurement of particulate matter (PM) during the Cold FTP diesel test, since PM is not part of the fuel economy carbon balance calculation, and thus has no impact on fuel economy. Third, for manufacturers voluntarily using the 5-cycle method during the 2008–2010 model years, fuel economy over the Cold FTP may be reported based on carbon monoxide (CO) and carbon dioxide (CO_2) measurements only, excluding the hydrocarbon (HC). Based on limited existing data showing that HC makes up a negligible fraction of the total cold fuel economy results (less than 0.1%), the

[49] Based on fuel economies of gasoline and E85 reported in the Model Year 2006 Fuel Economy Guide, p. 18.

[50] See the applicable regulations at 40 CFR 86.1810(i)(4) and 40 CFR 86.1811–04(g).

[51] ASTM International Specification D975–04C ''Standard Specification for Diesel Oil Fuels'' (November 1, 2005) describes the seven grades of diesel fuel oils suitable for various types of diesel engines. This specification is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of subcommittee D02.E0 on Burner, Diesel, Non-Aviation Gas Turbine, and Marine Fuels.

[52] 40 CFR Part 80—Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engines and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements: Final Rule and Regulation of Fuels and Fuel Additives: Fuel Quality Regulations for Highway Diesel Fuel Sold in 1993 and Later Calendar Years.

measure of HC will not be required during the 2008–2010 model years. This interim provision is another way to address manufacturers' concern about lead time for diesel cold testing facility upgrades, as measuring HC at cold temperatures requires the use of a heated FID, which many manufacturers do not have in existing cold facilities. In the 2011 model year and beyond, manufacturers will be required to conduct and report the results from the Cold FTP diesel testing, including the CO, CO_2, and HC measurements.

2. Alternative-Fueled Vehicles

There are two types of alternative-fueled vehicles: (1) Flexible-fuel vehicles (FFVs; also known as dual-fueled, bi-fueled, or multi-fueled vehicles) that can operate on gasoline or diesel and/or some alternative fuel (*e.g.*, ethanol or methanol), and (2) dedicated alternative fueled vehicles that operate only on the alternative fuel (*e.g.*, such as compressed natural gas (CNG) vehicles).

FFVs are subject to the SFTP (which includes the US06 and SC03 tests) and Cold CO emission standards and test requirements, but only when operating on gasoline. Thus, we proposed that the fuel economy label values of FFVs when operating on gasoline be determined using the same mpg-based or 5-cycle approaches applicable to gasoline vehicles and thus additional testing for US06, SC03 and Cold FTP while operating on the alternative fuel would not be required. Although the fuel economy values when operating on an alternative fuel are not required to be reported on the label, manufacturers may voluntarily include these values on the label and they are also reported in the annual Fuel Economy Guide. In addition, the mpg-based and 5-cycle approaches only use fuel economy values measured in terms of miles per gallon of gasoline or diesel fuel. Thus, we proposed an approach to specify how manufacturers of FFVs must determine and report the fuel economy label values when the vehicle is operated on an alternative fuel. We proposed that the city and highway fuel economy label values must reflect the same adjustment factors relative to FTP and HFET fuel economy, respectively, developed using the applicable mpg-based or 5-cycle approach for gasoline. Specifically, the city and highway fuel economy values when the FFV is operated on gasoline would be used to calculate the mpg-based or 5-cycle approach (whichever applicable). Then, the city and highway fuel economy values calculated from the mpg-based or 5-cycle approach would be divided by the city and highway fuel economy during FFV gasoline operation to determine a ratio. This ratio would then be applied to the city and highway fuel economy values when the FFV is operated on an alternative fuel. This would allow the manufacturer to determine a mpg-based or 5-cycle, alternative fuel equivalent value for the purpose of voluntary labeling and Fuel Economy Guide reporting purposes.

For example, assume that the measured FTP and HFET fuel economy is 24 and 32 mpg, respectively, for an FFV operating on gasoline, and 18 mpg and 26 mpg, respectively, for a FFV operating on the alternative fuel. Using the measured gasoline values and the mpg-based approach,[53] we can calculate the city and highway fuel economy, as shown below:

$$\text{FE gasoline}_{\text{mpg, city}} = \frac{1}{0.0033563 + \frac{1.17895}{24\text{ mpg}}} = 19\text{ mpg}$$

$$\text{FE gasoline}_{\text{mpg, highway}} = \frac{1}{0.0013934 + \frac{1.34619}{32\text{ mpg}}} = 23\text{ mpg}$$

The resulting city and highway label values for the FFV when operating on gasoline are 19 mpg and 23 mpg, respectively. We divide these values (19 and 23 mpg) by the measured city and highway fuel economy values, 24 and 32 mpg, during FFV gasoline operation to determine the ratios.

$$\text{ratio}_{\text{city}} = \frac{19\text{ mpg}}{24\text{ mpg}} = 0.826$$

$$\text{ratio}_{\text{highway}} = \frac{23\text{ mpg}}{32\text{ mpg}} = 0.719$$

For this example, the ratios would be 0.826 (*e.g.*, 19 mpg divided by 24 mpg) for the city ratio and 0.719 (23 mpg divided by 32 mpg) for the highway ratio. To calculate the mpg-based city and highway fuel economy values for an FFV operating on alternative fuel (for voluntary inclusion on the label or in the Fuel Economy Guide,) multiply the measured values (18 mpg and 26 mpg) by their respective ratios.

$$\text{FE altfuel}_{\text{city}} = \text{FTP altfuel} \times \frac{\text{FE gasoline}_{\text{mpg, city}}}{\text{FTP gasoline}} = 18\text{ mpg} \times 0.826 = 15\text{ mpg}$$

$$\text{FE altfuel}_{\text{highway}} = \text{HFET altfuel} \times \frac{\text{FE gasoline}_{\text{mpg, highway}}}{\text{HFET gasoline}} = 26\text{ mpg} \times 0.719 = 19\text{ mpg}$$

The estimates reported on the label and in the Fuel economy guide would be 15 mpg (*e.g.*, 18 mpg times 0.826, the city ratio from gasoline operation) for the city fuel economy and 19 mpg (*e.g.*, 26 mpg times 0.719, the highway ratio from gasoline operation) for the highway fuel economy. This can also be done using the 5-cycle approach, as applicable.

We did not receive any comments on the proposed label methods for FFVs

[53] Section II contains a derivation of these equations. This method for determining the fuel economy label values for FFVs can be used when the city and highway values are determined by either the mpg-based method or the 5-cycle method, whichever is applicable. In this example we demonstrate the use of the mpg-based method.

and, as such, we are finalizing the provisions as stated in the proposal.

Manufacturers of FFVs may optionally use the 5-cycle approach at their discretion for reporting fuel economy when operating on the alternative fuel. If this option is used, the manufacturer would be required to conduct all applicable 5-cycle test procedures on the alternative fuel and use both the 5-cycle city and highway calculation methods to determine fuel economy label. In addition, for Cold FTP testing under the 5-cycle approach, the use of a manufacturer-specified alternative fuel, with EPA approval, will be used under the alternate test procedure provisions in 40 CFR 86.113–94. As stated above, manufacturers will report these values in the annual Fuel Economy Guide and may voluntarily include these values on the label.

Dedicated alternative-fueled vehicles are also exempt from the SFTP and Cold FTP emission standards. As a result, these vehicles will not have the SFTP and Cold FTP fuel economy data needed to determine 5-cycle fuel economy values. We proposed that manufacturers of dedicated alternative-fueled vehicles be able to use the mpg-based approach in the 2011 model year and beyond, as well as during the 2008–2010 model years, in order to avoid conducting additional tests for fuel economy reasons only. Further, since the mpg-based approach uses fuel economy values measured in terms of miles per gallon of gasoline or diesel fuel, the fuel economy of dedicated alternative fuel vehicles must be expressed in terms of its gasoline equivalent prior to using the mpg-based formula. Currently, all dedicated alternative-fueled vehicles express fuel economy values in terms of a gasoline equivalent.[54] For this case, we proposed that the fuel economy values for a dedicated alternative vehicle expressed in gasoline equivalents are directly determined using the mpg-based approach.

We did not receive any comments on the proposed provisions for dedicated alternative-fueled vehicles and, as such, we are finalizing the provisions as stated above.

Finally, we proposed that manufacturers of dedicated alternative-fueled vehicles may optionally use the 5-cycle approach at their discretion. If this option is used, the manufacturer would be required to conduct all applicable 5-cycle test procedures on the alternative fuel, and then convert all the alternative fuel values into gasoline equivalents prior to use in the 5-cycle formulae for city and highway label values. Because dedicated alternative fuel vehicles are not subject to the Cold FTP test procedures today, there is no cold test fuel specification for alternative fuel (e.g., CNG or E85). Thus, if a manufacturer wishes to do 5-cycle testing, it would need to request EPA approval of the cold test fuel under the special test procedure provisions in 40 CFR 86.113–94.

We did not receive any comments on the proposed provisions for dedicated alternative-fueled vehicles to optionally use the 5-cycle approach and, as such, we are finalizing the provisions as stated in the proposal.

B. Modifications to Existing Test Procedures

To ensure that the 5–cycle method is more reflective of real-world operating conditions, there are a few procedural changes that need to be made to certain existing emission tests procedures. First, we proposed procedural changes in the US06 tests, as described below. Second, we sought comment on the issue of requiring manufacturers to run the heater and/or defroster during the cold FTP test. Third, we proposed to codify the existing practice of requiring four-phase FTP measurements for gasoline-electric hybrid vehicles.

1. Splitting the US06 Test Into City and Highway Segments

The US06 driving schedule contains elements of both city and highway driving, yet the exhaust sample is collected in only one sample, or ''bag.'' In order to more accurately reflect the city portion of the driving schedule into the city fuel economy estimate, and the highway portion of the driving schedule into the highway fuel economy estimate, we proposed a revised test protocol that would require collecting the exhaust sample into two bags. This has the benefit of more accurately capturing how a vehicle's fuel economy would be impacted over the various types of driving reflected in the driving schedule.

We undertook a test program to determine the technical feasibility of splitting the US06 exhaust sample in two bags, and whether it would impact emissions results for compliance purposes. We evaluated the effects of conducting a US06 split-phase (i.e., two bag) emissions test versus the current US06 single-phase (one bag) emission test on ten vehicles at EPA's National Vehicle and Fuel Emissions Laboratory (NVFEL) in Ann Arbor. Based on this evaluation, the US06 split-phase sampling methodology was shown to be feasible for fuel economy purposes and required only initial software reprogramming for the revised sampling periods and minimal hardware changes to enable the emissions analyzers to perform US06 split-phase emission testing. In addition, creating a US06 split-phase sampling period did not result in any significant difference in criteria pollutant emissions results. The full report on this US06 split phase evaluation program is available in the docket.[55]

We received comments from the auto industry that the costs of collecting US06 exhaust emissions into two bags are substantial, but they did not provide any cost data to substantiate this claim. Further, the auto industry claimed that there will be decreased accuracy and increased variability if the US06 test is split into two phases, yet they did not provide additional data or analysis to support this claim. Finally, the auto industry claimed that significant software changes and lead time would be required to implement the two-phase bag software for diesel vehicles due to necessary one-phase PM sample collection systems for diesels, integrated real-time total hydrocarbon (THC) data collection for fuel economy calculations, and the alignment with methane (CH_4) bag measurements for compliance with the emission standard. The auto industry recommended that we allow the use of alternative methods of determining the US06 city and highway fuel economy in lieu of conducting a two-bag US06 test. One suggested method was to use second-by-second data over a one-bag US06 test, either from modal bench analyzers or via On-Board Diagnostic (OBD) data stream information, to determine the city portion and highway portion and develop a two-bag US06 fuel economy calculation. Finally, it was suggested that we allow some flexibility for future methods that may be developed to measure or derive the city and highway US06 fuel economies.

While we continue to believe the two-bag US06 measurement proposed is a valid approach that will not lead to significant differences in emission results, we also believe that the alternative approaches suggested by the auto industry could yield technically valid results and thus have merit. As a result of the comments, we have revised the proposal and are finalizing the requirements below for the two-bag US06 measurement.

For the 2008 through 2010 model years, those manufacturers choosing to

[54] See § 600.113–93.

[55] Mitcham, A. & Fernandez, A., ''Feasibility of Revising the US06 Test Cycle into a Split Phase Sampling Test Procedure'' U.S. EPA, Office of Transportation & Air Quality, 2005.

use the 5-cycle approach must either conduct the two-bag US06 test or determine two-bag results from a one-bag test using an alternative method (as discussed below). For the 2011 model year and beyond, for all certified test groups, the two-bag US06 must be conducted or data supplied in two-bag US06 format.

To determine US06 two-bag fuel economy, manufacturers may use alternate test methods in lieu of conducting an actual two-bag US06. Such alternate test methods include: (1) Conducting a one-bag US06 and using emissions analyzer modal data to determine the appropriate ratio of city and highway operation; or (2) conducting a one-bag US06 and using OBD fuel rate (e.g., grams of fuel per second) data to determine the appropriate ratio of city and highway operation over the one-bag US06. Additionally, the manufacturers may use other methods based on good engineering judgment, with EPA review and approval, as long as these methods achieve equivalent or better, technically valid results based on manufacturer submitted data. For the case of conducting a one-bag US06 and using the emissions analyzer modal or OBD fuel rate data, the ratio of city and highway operation over the one-bag US06 is applied to the CO, CO_2 and HC results in order to determine the city and highway US06 fuel economy values, constituting a ''virtual'' two-bag US06. However, this option only applies for determining the city and highway US06 fuel economy and, thus, is not applicable for determining US06 emissions. The requirements for conducting a two-bag US06 and the options for alternately measuring or deriving the two-bag US06 outlined above are applicable to both gasoline and diesel vehicles.

2. Heater/Defroster Usage During the Cold FTP

The current Cold FTP conducted at 20 °F includes the option to use the heater and/or defroster.[56] While we understand that some manufacturers today are using the heater and/or the defroster during the Cold FTP, it is not mandatory and therefore subject to inconsistent usage across manufacturers and vehicle lines. We expect that, in the real-world, it would be highly unusual for drivers not to use the heater/defroster when the temperature is cold, including at 20 °F experienced during the Cold FTP. In order to more closely reflect real world operation, and to ensure a level playing field across manufacturers and vehicle lines when performing this test, we sought comment on requiring manufacturers to operate the heater and/or defroster during the Cold FTP.

As discussed in the NPRM, we conducted a test program through the Southwest Research Institute (SwRI) that measured the impacts of heater and defroster operation on fuel economy for three vehicles during a 20 °F Cold FTP. We compared the fuel economy results with heater/defroster operational to the results of the heater/defroster non-operational on each vehicle. The Cold FTP fuel economy with the heater/defroster on was significantly lower than that with the heater/defroster off, ranging from –6.0 percent (~1 mile per gallon lower on a non-hybrid vehicle) to –17.9 percent (~8 miles per gallon lower on a hybrid vehicle). We did not observe a significant impact on CO or other measured emissions as a result of the use of the heater/defroster on the Cold FTP. The results of this test program indicated that different vehicles were impacted more than others, indicating that it is important to capture the impact on fuel economy of heater and defroster use during cold conditions. The full report of this test program is contained in the docket.[57]

The auto industry commented that the heater/defroster requirement should be deferred until we have a better understanding of real-world operation of heater/defroster systems. Some manufacturers suggested that there is a far smaller impact on fuel economy due to defroster/heater operation than EPA estimates in the proposal based on the SwRI test program, but they provided no data to support this claim.

Several state and environmental organizations supported the requirement to use the heater/defroster on the Cold FTP test and recommended that we develop a standardized methodology based on realistic usage patterns. One commenter also cited the level playing field aspect, noting that manufacturers who choose to use more realistic test conditions may be penalized relative to those who do not.

We believe, as we stated in the proposal, that it is important to reflect the heater/defroster operation in our fuel economy test procedures since heater/defroster operation can have an additional impact on fuel economy,[58] these accessories are used in the real-world at cold temperatures including 20 °F, and it is necessary to maintain a level playing field across manufacturers to prevent gaming of the test procedure.

We support the need for the heater/defroster test procedure to reflect real world operation. However, we believe that a standardized test protocol must be implemented as soon as possible so that this real-world impact is taken into account in the new fuel economy test methods. There are many approaches for how the heater and defroster usage could be incorporated into the Cold FTP test procedures, including specifying appropriate fan speed settings, timing of turning on the heater/defroster during the test, and accounting for various vehicle climate control designs. Therefore, we sought comment on the methods for how heater/defroster usage could be specified in the cold FTP procedure.

Specifically, we discussed a concept that started the test with the airflow directed to the windshield for optimal defrosting, the airflow source set to outside air (not recirculation), and the air temperature set to high. Approximately 2 minutes into the test, the fan speed could be turned to maximum and left there for the duration of the test. This would mimic typical driver behavior in that we expect many drivers would not turn the fan to maximum until the engine is producing some level of heat, which most vehicles will do within a couple minutes of driving. The second concept involved the automatic climate control systems set to achieve an inside air temperature of 72°F, and the fan speed, if independently selectable, would be operated as described above. The third concept related to vehicles with multiple zones (either driver and passenger, or front and rear) and required operating the controls for all zones as described above. Finally, since some climate control systems might not be compatible with these instructions, we proposed to allow a manufacturer to request the use of special test procedures, under 40 CFR 86.1840–01, subject to EPA approval.

We received comments from the auto industry that the test protocol for running the heater/defroster should mimic as closely as possible how drivers typically operate the heater/defroster system in the real-world. Specifically, they commented that a driver would not keep the fan speed at

[56] See 40 CFR 86.230–94(f).

[57] Southwest Research Institute (SwRI), ''VOC/PM Cold Temperature Characterization and Interior Climate Control Emissions/Fuel Economy Impact; Final Report Volume II.'' Prepared for U.S. EPA under contract 68–C–05–018, SwRI Project No. 03.11382.04.

[58] Southwest Research Institute (SwRI), ''VOC/PM Cold Temperature Chracterization and Interior Climate Control Emissions/Fuel Economy Impact: Final Report Volume II.'' Prepared for U.S. EPA under contract 68–C–05–018, SwRI Project No. 03.11382.04.

maximum for 43 minutes, the effective length of the test, and that many electronic systems automatically bring the fan speed down as the vehicle warms up, and that some vehicles can not simultaneously be in defrost mode and have the blower off. They also commented on the potential impact of this operation on the stringency of existing and proposed emission standards (e.g., proposed Mobile Source Air Toxics cold hydrocarbon standards).[59]

We are finalizing mandatory heater/defroster operation during the Cold FTP, but with some changes to the test protocol to more closely reflect real world operation. Further, we are addressing issues of lead time with respect to applicable model years for mandatory heater/defroster operation during the Cold FTP.

We are revising the applicable model years for implementation of mandatory heater/defroster operation during the Cold FTP. For the 2008 through 2010 model years, only those manufacturers choosing to optionally use the 5-cycle approach are required to operate the heater/defroster during the Cold FTP. This will allow manufacturers time to fully assess any impacts related to the EPA's Mobile Source Air Toxic (MSAT) cold hydrocarbon proposed standards,[60] which would also be determined based on the Cold FTP test. Again, we reiterate that our heater/defroster testing, run under a worst-case protocol, did not indicate an impact on emissions. However, we understand that some manufacturers desire additional lead time for conducting their own analyses to confirm these results. For the 2011 model year and beyond when the 5-cycle approach becomes effective, manufacturers are required to operate the heater/defroster during the Cold FTP.

The test protocol we are finalizing has been revised from that outlined in the proposal as follows. At the start of the test, manually controlled climate control systems will have the airflow will be directed to the windshield for optimal defrosting, the airflow source set to outside air (not recirculation), the fan speed set to off or ''low'' and the air temperature set to the hottest setting. At the second idle of the test (approximately two minutes into the test, allowing the engine to accumulate some heat) the fan speed will be set to maximum. At the sixth idle of the test, at approximately 505 seconds into the test (corresponds with the end of bag 1 and the start of bag 2 of the Cold FTP), the fan speed setting will be reduced to the lowest possible setting to maintain air flow, and the temperature setting will remain at the hottest setting. These settings will be held for the remainder of the test, including the final bag following the 10 minute soak period. For automatic climate control systems, the manufacturer can manually override the system and use the provisions specified for manual systems, or the system selector will be set to heater or defroster mode and the temperature will be set to 72°F for the duration of the test. All other aspects of heater/defroster operation and climate control settings during the Cold FTP discussed in the proposal will be finalized unchanged. For vehicles with multiple zone climate control systems (e.g., front and rear temperature/fan controls and/or separate driver/passenger temperature/fan controls), the same fan and temperature settings should be set and maintained for all the zones for both manual and automatic interior climate control systems, if feasible. If these settings are not feasible, manufacturers may request and use alternate settings, with prior agency approval, only for vehicles with multiple zone climate control systems. If a manufacturer does request alternate settings for multiple zone systems, at a minimum, the settings for the front passenger zone of the multiple zone system must follow the protocols set forth above.

The regulations specify that the manufacturer must use good engineering judgment and consider potential engine control changes that may be directly impacted by the temperature setting on the manually controlled systems (e.g. has direct input to, or can directly affect, the engine control logic). For example, when the heater or defroster is engaged a system may employ such strategies as disabling of engine-off idling features, disabling of cylinder deactivation, or different engine idling speed. Also, at the 20°F ambient temperature of the Cold FTP, it is highly unlikely that vehicles will experience any use of the air conditioning compressor during defroster operation and any fuel economy differences between heater and defroster operation would be related to engine control changes (e.g., engine off logic, idle speed changes, spark advance changes).

We recognize that there may be unique climate control systems that are not addressed through these protocols. To address such systems, manufacturers can request in writing EPA approval of alternative heater/defroster test protocols/procedures.

3. Hybrid Electric Vehicle Testing Provisions

The FTP consists of two parts referred to as the ''cold start'' and the ''hot start'' portion of the test. The ''cold start'' portion is performed following an eight to twelve hour soak at a stable temperature of 72°F that stabilizes the vehicle and brings the engine coolant temperature to a ''cold'' condition. The ''hot start'' portion is performed following prescribed driving sufficient to bring the vehicle (and engine coolant) up to full operating temperature, and then a ten minute soak that stabilizes the vehicle. The cold start and hot start are divided into two periods, or ''phases'': A ''transient'' phase and a ''stabilized'' phase (i.e., the vehicle is warmed up), which constitute what is known as the Urban Dynamometer Driving Schedule (UDDS). The emissions for each of the FTP phases are collected in ''bags,'' terminology that results from the sample bags in which the exhaust samples are collected. The full four phases of the FTP are conducted in the following order: Cold start transient phase (bag 1), cold start stabilized phase (bag 2), hot start transient phase (bag 3), and hot stabilized phase (bag 4).

For conventional vehicles, the stabilized phase of the hot start test (bag 4) is assumed to be identical to the stabilized phase of the cold start test (bag 2). Thus, the hot stabilized phase (bag 4) is typically not performed for conventional vehicles and is accounted for in the emission and fuel economy results mathematically by including the cold stabilized phase (bag 2) results twice in the calculation. However, since hybrid-electric vehicles have dual energy sources that can be operated in synergistic modes, the gasoline or diesel engine is supplemented by the electric motor and may not be at peak, optimized operating temperatures during the entire FTP. Based on this, the EPA and manufacturers recognized that the assumption regarding the equivalence of the cold and hot stabilized phases, and counting the cold stabilized phase twice in the calculation, may not be valid for hybrid vehicles. Consequently, we currently require hybrid-electric vehicles to conduct all four phases of the FTP.

For hybrid-electric vehicles, the emissions collection process for the FTP can be performed in two different ways: (1) ''4-bag procedure—the emissions are collected in an individual bag (e.g., bag 1, bag 2, bag 3, and bag 4) for each phase and analyzed, a total composite emissions number is calculated based on the emissions in all the bags, and the

[59] See 60 FR 15804, ''Control of Hazardous Air Pollutants From Mobile Sources'' (March 29, 2006).

[60] Ibid.

emissions numbers for each of the bags and the composite emissions are reported; or (2) the emissions from the cold start transient phase and cold start stabilized phase are collected in bag 1 and analyzed, the emissions from the hot start transient phase and hot start stabilized phase emissions are collected in bag 2 and analyzed, a composite number is calculated based on the emissions in both bags, and the emissions for both bag 1 and bag 2, and composite emissions are reported. The first collection method, a 4-bag FTP, and the second collection method, a 2-bag FTP, are similar in that the emissions are collected over the full four-phases of the FTP. However, the two methods differ in that for the 2-bag FTP, the bags are combined as follows: bag 1 is a combination of bag 1 and bag 2 of the 4-bag FTP, and bag 2 is a combination of bag 3 and bag 4 of the 4-bag FTP.

Therefore, for the purposes of this rulemaking in relation to hybrid-electric vehicles, we are concerned about two distinct things: (1) The number of phases (e.g., four phases for hybrid-electric vehicles versus three phases for conventional vehicles, as described above) required to be conducted during the FTP and (2) the number of bags (e.g. two bags versus 4 bags, as described above) that the emissions are collected in over the FTP, in particular, for hybrid-electric vehicles, which we want to require the full four phases for the FTP.

We currently require hybrid-electric vehicles to perform the complete set of four phases of the FTP and referenced the existing, special test procedure provisions in the regulations (40 CFR 86.1840–01) as the basis for this. Rather than continue using the special test procedure provisions, we proposed to develop explicit regulatory language to require full-four phase testing of hybrid-electric vehicles. Additionally, the 5-cycle formula for hybrid-electric vehicles requires the four phases of the FTP as inputs for these vehicles. Therefore, we also proposed to develop explicit regulatory language that requires hybrid-electric vehicles to conduct all four phases of the FTP for both emissions and fuel economy testing. Finally, we proposed to require that the emissions from the full four phases of the FTP be collected in individual bags (i.e., four bags; one bag for each phase) for all tests using the FTP, including the cold temperature FTP, for those vehicles defined as hybrid-electric vehicles. We also requested comment on the proposal, and on whether use of the phrase ''hybrid electric vehicle'' is sufficient to describe and identify vehicles for which the four-bag FTP would be required.

We received the following comments regarding requiring the hybrid electric vehicle test procedures. First, the auto industry commented that 40 CFR 86.1811–04(n) of our regulations, which aligns with California, already requires the full four phases of the FTP for hybrid-electric vehicles for emissions testing, and therefore suggested we should retain section 86.1811–04(n) as-is without further codifying language requiring the full four phase FTP. Second, the comments suggested that we also define the four-phase, two-bag FTP and four-phase, four-bag FTP in part 600 of our regulations so that it is only applicable to fuel economy measurement, not for emissions measurement, which is contained in part 86 of our regulations. Third, the comments supported our proposal to extend the full four-phase FTP testing for hybrid vehicles to the Cold FTP. Finally, the comments cited that requiring four bags would force facility modifications with significant costs and lead time issues and identified the benefits of the four-phase, two-bag approach, including improved accuracy and alignment with California. To address this, the comments recommended that we add 5-cycle fuel economy equations for both two-bag and four-bag testing with appropriate bag fuel consumption weighting by theoretical distance traveled to ensure consistent label adjustments between two- and four-bag data. Finally, we did not receive any comments on whether the use of the phrase ''hybrid electric vehicle'' is sufficient to describe and identify vehicles for which the four-bag FTP would be required.

As a result of these comments, we have revised the proposal and are finalizing the requirements for hybrid electric vehicle test procedures as follows. First, for requiring the full, four-phase FTP testing for emissions, we agree that 40 CFR 86.1811–04(n) does properly reference the California procedures which require the full four phase FTP. In addition, part 600 refers back to procedures in part 86, including 40 CFR 86.1811–04(n) which references the California procedure for four-phase FTP testing. Therefore, it is not necessary to develop further language to require the full four phase FTP.

Second, we proposed to extend the requirement for full, four phase FTP testing of hybrid vehicles to the Cold FTP. Upon further analysis of this provision, we are not finalizing this requirement. As discussed in Chapter III of the Final Technical Support Document, vehicles may not be fully warmed up during bag 2 of the Cold FTP. Thus, fuel economy over a bag 4 of the Cold FTP would likely be higher than that over bag 2. Thus, vehicles tested over a 4-bag Cold FTP would likely have higher fuel economy per the 5-cycle formulae than those tested over a three bag test. This would result in inconsistent fuel economy estimates for conventional and hybrid vehicles. Therefore, we will continue the current practice of only requiring a three-bag Cold FTP for both conventional and hybrid vehicles.

Third, we understand that some manufacturers may require some new software and additional test equipment to implement a four-phase, 4-bag test. In addition, since our test procedures are aligned with California requiring full four phase FTP testing for hybrid-electric vehicles, this essentially is an issue of how to divide and analyze the emissions results. While we are finalizing a requirement for four-phase FTP results, manufacturers may choose to collect the sample either in four bags or two bags, as discussed above. Accordingly, we are finalizing today an option for a 5-cycle formula that allows for four-phase, 2-bag FTP inputs for hybrid-electric vehicles. Our analysis of this option in the Technical Support Document shows that there is no significant difference in fuel economy results from using a 2-bag versus 4-bag equation.

Finally, since we did not receive any comments on whether the use of the phrase ''hybrid electric vehicle'' is sufficient to describe and identify vehicles for which the four-bag FTP would be required, we believe this terminology is sufficient and will use ''hybrid electric vehicle'' in reference to the four-phase, four-bag FTP.

V. Projected Cost Impacts

The majority of the costs of this rule are due to an increase in the manufacturer test burden. While manufacturers conduct tests today for emissions compliance and fuel economy reporting, they test a more limited set of vehicles than will be necessary for the fuel economy labeling calculations in model years 2011 and beyond. There are also startup costs to implement the new fuel economy reporting requirements beginning during the transition period from model year 2008 through 2010.

The final rule requires calculation of fuel economy values based on the 5-cycle formulae beginning with model year 2011 for some vehicle test groups. As discussed in detail elsewhere in this preamble, for model years 2008 through 2010, manufacturers may use the mpg-based calculation for the five-cycle fuel

economy values or they may conduct voluntary testing. For model years 2011 and beyond, if the five-cycle city and highway fuel economy values for an emission data vehicle group are below 96 percent and 95 percent of the mpg-based regression line, respectively, then all the vehicle configurations represented by the emission data vehicle (e.g., all vehicles within the vehicle test group) would use the 5-cycle approach. Vehicles within a test group falling below the city fuel economy band would be required to conduct US06, SC03, and Cold FTP tests; those falling below the 5 percent tolerance band for highway fuel economy values but not below the city tolerance band would be required to conduct US06 tests (the effects of cold temperature and air conditioning would be modeled). In addition, we expect that some of these vehicles falling below the tolerance band may be eligible to estimate fuel economy for a given test through the application of analytically derived fuel economy values. Some data are currently available for vehicles that have conducted all 5 tests; based on these data, EPA has estimated the number of vehicles for which additional testing would be required because they fall below the 4 and 5 percent tolerance bands, as discussed further in Section II.

EPA received no comments on the overall methodology of its cost analysis or the general cost assumptions used in that analysis. However, we received comments on a number of specific proposal issues having cost implications, including changes to various test procedures. These issues are specified in Section IV and the Response to Comments document. The impacts of the resolution of these issues on the final cost analysis are summarized here and are discussed in more detail in the Technical Support Document.

As in the cost study for the proposed rule, we are presenting low and high estimates of the economic impact for two time frames: (1) Model years 2008 to 2010, and (2) model year 2011 and thereafter. The low and high estimates of testing burden scenarios provide boundaries on the potential testing costs and informational startup costs.

A. Incorporation of New Test Cycles Into Fuel Economy Label Calculations

1. Testing Burden for 2008 Through 2010 Model Years

We are finalizing as proposed our estimate that no additional tests will be required during model year (MY) 2008 through MY 2010. Manufacturers may simply apply the mpg-based adjustments to the same FTP and HFET test results that they otherwise would conduct for the fuel economy labeling program today (see Section II). While manufacturers have the option of conducting and reporting full 5-cycle test results, such tests are not required by this final rule, and we have not included this testing in our cost estimates. Manufacturers that voluntarily choose to conduct full 5-cycle testing would incur some additional testing costs, which we have not included in our cost estimates, since we do not have any means of predicting which manufacturers would choose this option, or for which vehicle models, or the amount of additional testing that would be performed.

2. Testing Burden for 2011 and Later Model Years

To derive low and high estimates for the number of additional tests required for our proposal, we used EPA data on the number of FTP/HFET, US06, SC03, and Cold FTP tests. Based on MY 2004 data[61], 1,250 fuel economy vehicles were tested with the FTP and highway fuel economy tests.[62] Data show that 330 SFTP (US06 and SC03) tests were conducted and 220 Cold FTP tests. Consequently, if all fuel economy vehicles were required to undergo full 5-cycle tests, approximately 920 additional SFTP tests and 1,030 Cold FTP tests would be required. EPA estimated, based on an analysis of our 423 vehicle dataset, that 8 percent of the test groups will fall outside a band approximately less than or equal to 96 percent of the regression for the city test and 23 percent outside a band approximately less than or equal to 95 percent of the highway regression. Taking the 2004 numbers above as a baseline, 92 percent of the additional SC03 and Cold FTP tests otherwise required would be avoided for city fuel economy; 77 percent of the additional US06 tests would be avoided. Thus, for example, the initial estimate of increased testing burden for SC03 would be 8 percent of the difference between 1250 and 330. The low and high estimates under these assumptions are generated by differing estimates of the effect of another feature that will be available for MY 2011 and after—and expanded use of ADFE as an alternative to conducting vehicle tests. The low and high burden estimates assumes that 20 percent and 0 percent of the additional tests would thereby be avoided, respectively.[63] Based on this analysis in our proposal, we estimated that potential increases in yearly testing could range as follows: 169–212 additional US06 tests, 59–74 additional SC03 tests, and 66–82 additional Cold FTP tests.

This approach is retained in the final cost analysis, with one adjustment. The percent falling outside the tolerance band for the city test and for the highway test should only count the vehicles that are below the tolerance band in both cases, that is, only those vehicles with fuel economy lower than 4 and 5 percent below the regression lines, respectively. With this correction, 4 percent of the test groups would trigger additional testing as falling below the city fuel economy regression tolerance and 13 percent below the highway regression tolerance. With the ADFE assumptions unchanged, the corrected additional test estimates range as follows: 96–120 additional US06 tests; 29–37 additional SC03 tests, and 33–41 Cold FTP tests.

Based on manufacturer comments, we have further revised the estimated test burden as a result of the four issues discussed in the following sections.

a. Fuel Economy Labeling for Medium-Duty Passenger Vehicles

As discussed in Section I, MDPVs will be included in the labeling program beginning with model year 2011. This change is based on NHTSA's expansion of the CAFE program to include MDPVs beginning the same model year. As discussed in Section I, we are finalizing fuel economy test methods for MDPVs that will not require additional testing beyond that which the CAFE program will require beginning in model year 2011 (i.e., the FTP and HFET tests). Therefore, we are projecting no additional costs in this final rule to extend labeling to MDPVs.

b. Cold FTP Diesel Testing

EPA proposed to require Cold FTP testing for light-duty diesel vehicles beginning with the 2008 model year. As discussed in Section IV, Cold FTP diesel testing is now optional until model year 2011, except for those manufacturers that voluntarily choose to do 5-cycle testing. Auto manufacturers commented that the proposed cost analysis neglected to account for Cold FTP diesel testing costs during MY 2008–MY 2010. The test burdens, including capital

[61] Model year 2004 certification data was the latest complete model year of data available at the time of the proposal. The certification data for model year 2005 is not significantly different.

[62] The figure is approximate because the city FTP test may be used and recorded primarily as a fuel economy test, an emissions test, or both.

[63] Based on EPA's current guidance to auto manufacturers on the use of ADFE, up to 20% of FTP/HFET tests are allowed to be calculated through ADFEs.

costs, were addressed in the proposal in terms of the number of tests estimated for MY 2011 and after. The preamble noted that eight city/highway test pairs were conducted for the five light-duty diesel vehicles certified in MY 2006.

Estimating the number of light-duty diesel vehicles certified in MY 2011 and beyond is difficult at this point, but several manufacturers have announced plans to expand or introduce diesel products in this time frame. As a result, for the final rule cost analysis we have doubled the number of certified light-duty diesel test groups in MY 2011 from five to ten. Accordingly, we have increased the estimated Cold FTP test volume from our proposed range of 66–82 tests and the corrected range of 33–41 tests to a range of 41–49 tests for the final rule. For the final rule, both low and high estimates for testing costs increase approximately $20,000 per year reflecting the increased number of tests under the unchanged testing cost assumptions of the proposal (Cold FTP facility upgrades are considered separately below). Additionally, the additional testing requirement is reflected in an increase in the corrected total capital costs (unamortized) for Cold FTP facilities of $770,000–$1,373,000 to a $957,000–$1,640,000 (unamortized).

In addition, commenters raised a number of technical issues regarding laboratory configurations and the difficulty of establishing cold test facility retrofits to accommodate diesel testing without a transition period. Extending the beginning of diesel cold testing requirement to 2011 is intended to address some of these concerns, particularly the lead time needed to implement laboratory modifications. To more fully account for the cost of these laboratory upgrades, we have revised the estimate by increasing capital costs by $55,000 for each of ten manufacturers to account for these upgrades.

c. Two-Bag US06 Measurements

The proposal included the costs of the requirement for two-bag US06 measurements as startup costs involving information system programming and validation tests, but not new facility costs. We are retaining these estimates for the final rule.

As discussed in Section IV, we received comments on the costs of collecting US06 exhaust emissions in two bags, particularly in view of software changes and the lead time needed to implement two-bag software. In response, EPA will accept alternative methods of calculating two-bag data. These alternatives are available for those manufacturers choosing to use the 5-cycle approach in the 2008 through 2010 model years, as well as manufacturers required to perform 5-cycle testing in model years 2011 and beyond. Our evaluation indicated that the new provisions provide ample lead time to be implemented. Therefore, accommodating two-bag US06 measurements would not significantly impact the cost analysis presented in our proposal.

d. Four-Phase FTP for Gasoline-Electric Hybrid Vehicles

The proposal included no additional costs for the four-phase FTP requirement for hybrid-electric vehicles. As discussed in Section IV, we received comments on costs of the proposed four-phase FTP in terms of lead time and installation of new hardware, software, and test equipment. In response to these comments, four-phase FTP testing will be required, but may be conducted as either a 2-bag or 4-bag measurement as suggested by the auto industry, as discussed in Section IV. Consequently, we foresee no additional cost impacts.

3. Cost Analysis of the Testing Burden

a. Capital Costs

The proposal estimated a capital cost of $4 million for a facility able to perform 750 US06 tests a year, $9 million for an environmental facility able to conduct 300 to 428 SC03 tests per year, and $10 million for an environmental facility able to conduct 300 to 428 Cold FTP tests per year. These costs were applied on a per-test basis to the increased tests required by the proposal, amortized at 7% and annualized over ten years. The resulting capital cost was $524,000 to $866,000 per year. Correcting the estimated number of new tests, applying the same facility costs to the increased estimate for Cold diesel testing, and adding the facility upgrades for Cold diesel, as discussed above, this capital cost has been adjusted to a low/high range of $375,000 to $560,000.

b. Labor and Operations and Maintenance (O&M) Costs

The proposal included costs of $1,860 to $2,441 for running each of the tests, allocated between labor and O&M based on prior Information Collection Requests. Adjusting for the corrected and additional testing as discussed above, we have changed our cost estimates from a proposed range of $606,000–$757,000 to a range of $343,000–$424,000 for the final rule.

c. Startup Costs

Startup costs are treated like capital costs, annualized over ten years and discounted at 7% beginning with model year 2008. The proposal included $3,472,000 in total information system costs, including reprogramming to report the new data, label design changes, plus $28,000 to $196,000 for information systems for the US06 split phase sample system. Finally, $195,000 to $651,000 was provided for validation testing of the US06 split phase sampling. Discounted and annualized, this came to $526,000 to $615,000 per year, industry-wide.

For the final rule, we have increased our range of estimated startup costs to $663,000–$752,000 to account for the additional information systems needed to manage the increased complexity of the fuel economy labeling reporting system. The auto industry commented that existing database management systems would need to be modified to accommodate the changes in fuel economy labeling calculations. EPA proposed to apply the mpg-line label calculations (i.e., ''derived 5-cycle'') at the vehicle test level, meaning the FTP or HFET results from a test vehicle would undergo the derived 5-cycle calculations to determine a fuel economy label value. The final rule requires applying the derived 5-cycle equation at the model-type rather than test level; however, this approach is not available for the vehicle-specific 5-cycle label calculation option and MY 2011 requirements. Therefore, the cost analysis has been updated to account for this increased information system burden.

Manufacturers will incur a one-time cost to upgrade their fuel economy data and reporting systems to account for the new fuel economy calculation procedures. Based on a projection of EPA's information development contract costs, we have increased the industry information startup costs (unamortized) by $933,450. This increases the annualized and discounted startup costs to a low/high range of $659,000 to $748,000 for the industry as a whole.

B. Revised Label Format and New Information Included

This cost item was included in the startup information portion of the cost analysis in the proposal. No adjustments have been made in the final analysis.

C. Reporting of Fuel Economy Data for SC03, US06, and Cold FTP Tests

As proposed, we do not expect capital or operating costs to increase due to

submission of additional information associated with additional tests. However, we do expect additional startup costs for information system programming. The startup burden has been modified as discussed above.

D. Impact on Confirmatory Testing

As proposed, the final rule does not include an increase in the number of vehicles targeted for confirmatory testing. We are not revising our proposed estimation of manufacturer confirmatory testing under the criteria of failed or high emission levels, unexpectedly high fuel economy, fuel economy leader within class, and fuel economy near the Gas Guzzler tax threshold.

E. Fees

The proposed rule did not include an increase in the fees to cover any increase in costs of issuing certificates of conformity under the new label rule. Instead, EPA will monitor its compliance testing and associated costs and, if necessary, in the future adjust the fees to include any new costs. We have retained this approach in the final rule.

F. Summary of Final Cost Estimate

As discussed above and summarized in the table below, aggregate annual costs for MY 2008 through MY 2010 are estimated to range from $663,000–$752,000, compared with the proposed range of $526,000–$615,000. For MY 2011 and beyond, aggregated annual costs are estimated to range from $1,377,000–$1,732,000 compared with the proposed range of $1,655,000–$2,238,000.

TABLE 5–1—AGGREGATE ANNUAL COSTS TO INDUSTRY

Cost Element	MY 2008 through MY 2010		MY 2011 and after	
	Minimum	Maximum	Minimum	Maximum
Test Volume (Labor, O&M)	$0	$0	$343,000	$424,000
Facilities (Capital, Annualized)	0	0	375,000	560,000
Startup (Capital, Annualized)	663,000	752,000	659,000	748,000
Total	663,000	752,000	1,381,000	1,732,000

VI. Implementation and Other Provisions

A. Revisions to Classes of Comparable Vehicles

The EPCA requires that the label include the range of fuel economy of comparable vehicles of all manufacturers.[64] EPA's comparable class structure provides a basis for comparing a vehicle's fuel economy to that of other vehicles in its class. We proposed to add separate classes for SUVs and minivans, which were previously included in the Special Purpose Vehicle category. We also proposed to modify the definition of ''small pickup trucks'' by increasing the weight limit from 4,500 pounds GVWR to 6,000 pounds GVWR. All comments on these proposals were favorable. Auto manufacturers suggested minor clarifications to the definition of minivan in order to distinguish it further from SUVs. We agree with these suggestions and are finalizing changes accordingly.

So-called ''crossover'' vehicles are those that meet the definition of more than one vehicle class, and thus are difficult to categorize. EPA currently uses discretion to assign these vehicles to a class on a case-by-case basis. For example, we attempt to determine which class assignment makes sense from a consumer perspective (e.g., is it more likely to be considered by consumers looking for a minivan or for an SUV) and what marketing segment is being targeted by the manufacturer. We did not propose to change how we are addressing the recent proliferation of ''crossover'' vehicles, but we requested comments on whether we should create a separate ''crossover'' class. Some public comments supported the creation of this class, but did not suggest how to define it. Auto companies were opposed to it, citing the difficulties in creating a meaningful class definition. Lacking such a definition that would clearly distinguish between a ''crossover'' vehicle and other vehicle classes, we are not creating a separate class for crossover vehicles. It should also be noted that the EPA-defined vehicle classes are used only to provide consumer information about fuel economy and serve no other regulatory purpose.

In portraying the range of fuel economy for comparable vehicles on the label, several commenters noted that the comparable class structure does not adequately provide consumers with meaningful fuel economy comparisons, and that class distinctions have been blurring in recent years. Commenters noted that many consumers shop across classes. These commenters did not suggest any specific revisions to the class structure to address these concerns; rather, their suggestions relate to the presentation of the comparable class information on the label, which is addressed in Section III. Additionally, manufacturers expressed concern that the wide fuel economy ranges of some classes are not necessarily representative of vehicles that consumers would normally compare (the example they cite is the midsize class, which contains the Toyota Prius and the Rolls Royce Phantom). Auto manufactures further noted that the highest sales vehicles are typically near the midpoint of the range, and that vehicles at either end of the range (low and high fuel economy) are typically vehicles with low sales volume or ''niche'' vehicles. They suggest that consumers usually shop within subsets of the defined vehicle classes, and not across the entire class. To address these concerns, manufacturers recommended against using a graphical representation of the comparable class fuel economy, and that EPA should continue to use the text that is used today. However, they did not suggest any specific changes to the class structure to address these concerns.

We believe that with the changes we are finalizing today, the comparable class structure generally represents the distinctions between vehicle types offered in the fleet today. Absent suggestions during the public comment period for new comparable vehicle classifications, we are finalizing the comparable class structure largely as proposed, with minor changes as discussed above. We welcome interested parties to continue working with EPA in the future on how to ensure that the comparable classes are kept current with the dynamic vehicle fleet. If it becomes necessary in the future to further modify the comparable class

[64] See 49 U.S.C. 32908(b)(1)(C).

structure, EPA would do so through a rulemaking.

B. Fuel Economy Ranges for Comparable Fuel Economy Graphic

Along with the label's new graphic of comparable fuel economy (Figure III.3), we proposed both how EPA would inform manufacturers of the within-class fuel economy ranges for the label, and how they are to present this information on the label if range data is not available in time for printing (which can occur for models introduced early in the year). For example, between August and September of each year, EPA typically issues guidance to the manufacturers specifying the fuel economy ranges for the comparable classes to be used on labels. Since we did not know the final design of the comparable fuel economy element at the time of the proposal, we suggested regulatory text nearly identical to the existing language, which requires the term ''N/A'' (for ''Not Applicable'') to replace actual range values when data is not yet available. However, since we are finalizing a graphical presentation of comparable fuel economy instead of regulatory text, it is necessary to use a different method to illustrate this information when the range is not yet available. Without the upper and lower range bounds, it is impossible to indicate where the vehicle's actual combined fuel economy falls on the range bar. Therefore, in cases when range data for the current model year is not available in time for printing the label, manufacturers must use the ranges of the previous model year. The vehicle's combined fuel economy will appear on the range bar relative to where it falls within the previous model year's range.

Model year 2008 vehicles introduced to the public before EPA can determine the 2008 fuel economy ranges must be considered further, because the previous model year range data is based on the 2007 methods for determining fuel economy, and is thus not comparable to the new data. Therefore, until EPA issues guidance on model year 2008 comparable class ranges, manufacturers must include the 2007 range data adjusted to account for the new methods. Upon issuance of this rule, we will provide these ''2007-adjusted'' ranges to manufacturers via guidance letter as soon as possible.

C. Temporary Option To Add ''Old Method'' City and Highway Estimates on Early Introduction Model Year Vehicle Labels

As discussed previously, all model year 2008 vehicles are required to calculate the city and highway fuel economy label estimates using the new methods being finalized today. Some manufacturers indicated that they may introduce model year 2008 vehicles as early as January 2, 2007. Consumers will then be comparing vehicles having fuel economy estimates based on the new methods to a large volume of model year 2007 vehicles having estimates based on the old methods. To address this, we are finalizing a temporary option allowing manufacturers to add additional information in fine print to model year 2008 vehicle labels indicating what the fuel economy estimates would have been using the old method. In other words, all model year 2008 vehicles are still required to estimate the city and highway fuel economy estimates using the new methods, but manufacturers may optionally add—in fine print only—information indicating what the estimates would have been under the previous methods. This option is available only until June 1, 2007, when a more significant number of 2008 models should be available for sale, and, thus, there will be few model year 2007 vehicles on dealer lots with which to compare. This option is available for labels with either the old or new design.[65]

D. Consideration of Fuel Consumption vs. Fuel Economy as a Metric

EPCA defines fuel economy as ''* * * the average number of miles traveled by an automobile for each gallon of gasoline (or equivalent amount of other fuel) used, as determined by the Administrator* * *''[66] Thus, EPA's fuel economy labeling program has historically expressed fuel economy in miles per gallon (mpg). We requested comments on how a gallons-per-mile fuel consumption metric could be used and presented publicly, such as in the Fuel Economy Guide. A few manufacturers suggested that it may be more meaningful to express fuel efficiency in terms of consumption (gallons per 100 miles) than in terms of economy (miles per gallon), because consumption directly measures the amount of fuel used, a metric related to cost that consumers may consider when filling up.

This final rule maintains the requirement that the label must express the estimates in terms of fuel economy, instead of fuel consumption. Since historically we have expressed fuel efficiency in miles per gallon, it is a metric that Americans understand. Our concern is that without a long-term, comprehensive public awareness campaign, any changes to the metric could confuse the public. Some commenters mentioned their interest in pursuing research and public education on the fuel consumption metric, and we look forward to learning more in the future from those stakeholders exploring the issue.

However, the labels currently provide an easy way to compare the fuel consumption of different vehicles. The estimated annual fuel cost information on the label is based on the fuel consumption metric: it is the dollar equivalent of the number of gallons consumed over 15,000 miles. Thus we believe that including the estimated annual fuel cost on the label is a valuable metric for consumers, because it relates directly to fuel consumption. We are also locating the estimated annual fuel cost information more prominently on the new label to raise public awareness.

E. Web-Based Driver-Specific Fuel Economy Calculator

In the proposed rule, we suggested implementing a web calculator in which consumers could input their own customized information in order to estimate more accurately their expected in-use fuel economy. User-specific information could include such factors as number of miles driven, mix of city and highway driving, air conditioner usage, average speed driven, ambient temperature, per gallon price of fuel, and others. We received several positive comments that a web calculator would be a useful tool, and could provide users with valuable insight on the effects of these factors on their fuel economy. Another commenter urged EPA to ensure that the tool would provide accurate results. We plan to consider further how to best design and implement a calculator tool, and we may seek additional input from interested stakeholders.

F. Fuel Basis for Estimated Annual Fuel Costs

To determine the estimated annual fuel cost, we currently require that manufactures use the same fuels that they require or recommend to customers. In the proposal we did not intend to change this, but we inadvertently omitted the text, ''or recommended,'' from the parenthetical statement in the regulatory text at 600.307–08(a)(3)(iv), regarding the fuel type used to determine the estimated annual fuel cost on the label. Therefore, we are adding the words, ''or

[65] As discussed in Section III, the new fuel economy label design becomes mandatory on September 1, 2007, before which manufacturers may optionally use it.

[66] See 49 U.S.C. 32901(a)(10).

recommended,'' to the regulations, which means that manufactures must use the fuel that they require or recommend to customers as a basis for the estimated annual fuel cost.

G. Electronic Distribution of Dealer-Supplied Fuel Economy Booklet

We proposed adding language to the regulations that allows dealers to fulfill their requirement to provide customers with copies of the Fuel Economy Guide booklet by using an on-site computer.[67] This method has been used on a trial basis in recent years. One commenter opposed this idea, citing that people are disinclined to use computers, and that the success of this method has been neither studied nor proven. However, the National Auto Dealer Association commented that this proposal should be finalized, because it is a more efficient, effective way of providing customers with this information. We agree that there are people who are disinclined to use computers, but we expect dealers who opt to provide the guide electronically to also provide assistance as needed to customers who want to access and/or print portions of the Fuel Economy Guide using the dealership's computer. Regulations that provide dealers with the option to provide the Fuel Economy Guide in this way do not relieve dealerships of the responsibility to make the Guide ''available to prospective buyers.'' [68] We are finalizing this requirement as proposed.

VII. Relevant Statutes and Regulations

A. Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 (EPCA) established two primary fuel economy requirements: (1) Fuel economy information, designed for public use, in the form of fuel economy labels posted on window stickers of all new motor vehicles, and the publication of an annual booklet of fuel economy information to be made available free to the public by car dealers; and (2) calculation of a manufacturer's average fuel economy and compliance with a standard (later, this compliance program became known as the Corporate Average Fuel Economy (CAFE) program).[69] The responsibilities for these requirements were split between EPA, DOT and the Department of Energy (DOE). EPA is responsible for establishing the test methods and calculation procedures for determining the fuel economy estimates to be posted on the window stickers and in the annual booklet (the Fuel Economy Guide), and for determining a manufacturer's corporate average fuel economy.[70] DOT is responsible for administering the CAFE compliance program, including establishing standards for non-passenger automobiles and determining if manufacturers are complying with the applicable CAFE standards, and assessing any penalties as needed.[71] DOE is responsible for publishing and distributing the annual fuel economy information booklet.[72]

EPA published regulations implementing portions of the EPCA statute in 1976. These regulations are codified at 40 CFR part 600. The provisions in this regulation, effective with the 1977 model year, established test methods and procedures to calculate fuel economy values for labeling and CAFE purposes that used the Federal Test Procedure (FTP or ''city'' test) and the Highway Fuel Economy Test (HFET or ''highway'' test) data as the basis for the calculations. At that time, the fundamental process for determining fuel economy was the same for labeling as for CAFE, except that the CAFE calculations combined the city and highway fuel economy into a single number.[73]

Under EPCA, EPA's fuel economy labeling regulations require manufacturers to label each ''automobile'' they produce. EPCA defines ''automobile'' in 49 U.S.C. 32901(a)(3) as:

> * * * a 4-wheeled vehicle * * * rated at—
>
> (A) Not more than 6,000 pounds gross vehicle weight; or
>
> (B) More than 6,000, but less than 10,000 pounds gross vehicle weight, if the Secretary decides by regulation that—
>
> (i) An average fuel economy standard * * * for the vehicle is feasible; and
>
> (ii) An average fuel economy * * * for the vehicle will result in significant energy conservation or the vehicle is substantially used for the same purposes as a vehicle rated at not more than 6,000 pounds gross vehicle weight.

Further, section 32902 authorizes DOT to set CAFE standards for ''automobiles,'' and section 32908 authorizes EPA to set labeling requirements for ''automobiles.'' Specifically, section 32908 states that, for the purpose of section 32908, '' 'automobile' includes an automobile rated at not more than 8,500 pounds gross vehicle weight regardless of whether [DOT] has applied this chapter to the automobile under section 32901(a)(3)(B).'' The effect of this is to essentially expand EPA's labeling authority to vehicles between 6,000 and 8,500 pounds GVWR, without the need for any finding by DOT to bring such vehicles into the definition of automobile under section 32901(a)(3)(B). Therefore, based on the definition of ''automobile'' in EPCA, EPA's labeling regulations are required to cover (1) all vehicles below 8,500 lbs GVWR, and (2) those vehicles between 8,500 and 10,000 lbs GVWR that DOT has determined by regulation should be subject to CAFE standards under EPCA. EPA has no authority under EPCA to require fuel economy labeling for vehicles above 10,000 lbs GVWR, or for vehicles between 8,500 and 10,000 lbs GVWR where DOT has not made the requisite regulatory determination to apply the CAFE standards. Those vehicles do not meet the definition of ''automobile,'' and EPA's authority to require fuel economy labeling is limited to ''automobiles.''

The Department of Transportation, through NHTSA, has recently determined that certain vehicles between 8,500 and 10,000 GVWR will be considered automobiles and subject to CAFE standards starting with model year 2011 (see 71 FR 17565 (April 6, 2006)). Based on this determination EPA is amending its labeling regulations in this final rule to include these vehicles. See the discussion regarding the adoption of fuel economy labeling regulations for medium-duty passenger vehicles in Section I.C.2.

EPCA requires manufacturers of automobiles to attach a fuel economy label to a prominent place on each automobile manufactured in a model year and also requires the dealers to maintain the label on the automobile.[74] EPCA specifies minimum requirements for the information to be included on the fuel economy label.[75] This final rule retains these items, as required:

a. The fuel economy of the automobile.

b. The estimated annual fuel cost of operating the automobile.

c. The range of fuel economy of comparable automobiles of all manufacturers.

d. A statement that a booklet is available from the dealer to assist in making a comparison of fuel economy of other automobiles manufactured by all manufacturers in that model year.

e. The amount of the automobile fuel efficiency tax imposed on the sale of the automobile under section 4064 of the Internal Revenue Code of 1986 (26 U.S.C. 4064).

[67] See 49 U.S.C. 32908(c)(3).

[68] See 49 U.S.C. 32908 (c)(3).

[69] See Pub. L. 94–163.

[70] See 49 U.S.C. 32904, 32908.

[71] See 49 U.S.C. 32904.

[72] See 49 U.S.C. 32908(c)(3).

[73] See 41 FR 38685 (Sept. 10, 1976).

[74] See 49 U.S.C. 32908(b)(1).

[75] See 49 U.S.C. 32908(b)(2)(A) through (F).

f. Other information required or authorized by the Administrator that is related to the information required [within items a. through d.].

EPCA also defines ''fuel economy'' as the average number of miles traveled by an automobile for each gallon of gasoline (or equivalent amount of other fuel) used, as determined by EPA.[76] Thus, this final rule retains the requirement to report fuel economy as miles-per-gallon.

EPCA also requires EPA to prepare a fuel economy booklet containing information that is ''simple and readily understandable.'' [77] This booklet is more commonly known as the annual ''Fuel Economy Guide.'' EPCA further instructs DOE to publish and distribute the booklet. EPA is required to ''prescribe regulations requiring dealers to make the booklet available to prospective buyers.'' [78] This final rule makes minor changes to these regulations by allowing manufacturers and dealers to make the Fuel Economy Guide available electronically to customers as an option.

B. Energy Policy Act of 2005

Section 774 of the Energy Policy Act of 2005 directs EPA to ''update or revise the adjustment factors in sections 600.209 85 and 600.209 95, of the Code of Federal Regulations, CFR Part 600 (1995) Fuel Economy Regulations for 1977 and Later Model Year Automobiles to take into consideration higher speed limits, faster acceleration rates, variations in temperature, use of air conditioning, shorter city test cycle lengths, current reference fuels, and the use of other fuel depleting features.'' [79]

In this final rule, the 5-cycle approach revises the test methods and procedures for calculating fuel economy, including updating and revising the adjustment factors, by establishing a new method to calculate fuel economy estimates that uses fuel economy results from additional test procedures combined with a changed adjustment factor. The mpg-based approach uses the same test methods as the current fuel economy program (i.e., the FTP and HFET tests), but changes the adjustment factors applied to those test results. These options satisfy EPA and the EPAct provisions as follows.

First, the 5-cycle method directly includes the effects of higher speed limits, faster acceleration rates, variations in temperature, and use of air conditioning by including fuel economy measured during tests that incorporate these features. The mpg-based approach also takes these factors into consideration, but less directly, as it incorporates the effects of these factors by basing the adjustment factor on an analysis of data developed from the 5-cycle method. Under the new regulations, the mpg-based approach is an interim option to establish an appropriate period of lead time for manufacturers. We also allow its continued use only where the average effects reflected under the mpg-based adjustments (of higher speed/acceleration, air conditioning, and cold temperature) on a specific vehicle configuration is representative of those measured under actual 5-cycle testing.

Second, we interpret the statute's reference to ''shorter city test cycle lengths'' to mean shorter than the current FTP cycle used to determine city fuel economy. We have addressed that concern by including updated factors for ''cold starts'' and ''hot starts'' (where the engine is not warmed up or has been parked for a brief amount of time and then restarted) in the equation for determining city fuel economy. This simulates shorter city test cycle lengths where a vehicle's engine is more frequently shut down and restarted than in the current FTP test. Also, the US06 and SC03 test cycles are physically shorter in length than the FTP (the FTP is about 11 miles in length, whereas the US06 is about 8 miles, and the SC03 is about 3.6 miles.)

Third, we interpret the statutory reference to ''current reference fuels'' to mean the laboratory fuels used to perform the fuel economy tests, and that the underlying concern of Congress was that the high-quality lab fuels would give higher fuel economy than the typical commercial fuel used by consumers. The quality of the laboratory test fuel is specified in EPA regulations for emission compliance. The test gasoline fuel is roughly equivalent to premium, high-octane fuel available at the pump. The impact of the higher-octane test fuel on fuel economy is less significant but there are other real-world fuel differences that can have a noticeable impact, as discussed in Section II. For instance, ethanol has a lower energy content than gasoline, and when blended with gasoline, with all other things being equal, will slightly lower fuel efficiency. Other seasonal variations in fuel composition (e.g., oxygenates in winter fuel) may also cause a slight reduction in fuel economy. EPA is proposing an adjustment factor to account for fuel differences and other fuel-depleting features as described further in Section II.

C. Other Statutes and Regulations

1. Automobile Disclosure Act

The Automobile Information Disclosure Act (AIDA) [80] requires the affixing of a retail price sticker to the windshield or side window of new automobiles indicating the Manufacturer's Suggested Retail Price, that is, the ''sticker price.'' Additional information, such as a list of any optional equipment offered or transportation charges, is also required.The Act prohibits the sticker from being removed or altered prior to sale to a consumer.

Under EPCA, manufacturers and importers of new automobiles are required to affix a label to such vehicles with an EPA label containing fuel economy information.[81] Normally, the price sticker label and EPA label are combined as one large label. Failure to maintain the EPA label on the vehicle is considered a violation of AIDA.

2. Internal Revenue Code

EPCA requires ''Gas Guzzler'' tax information to be included on the fuel economy label, under 26 U.S.C. 4064(c)(1). This code contains the provisions governing the administration of the Gas Guzzler Tax. It contains the table of applicable taxes and defines which vehicles are subject to the taxes. The IRS code specifies that the fuel economy to be used to assess the amount of tax will be the combined city and highway fuel economy as determined by using the procedures in place in 1975, or procedures that give comparable results (similar to EPCA's requirements for determining CAFE for passenger automobiles). This final rule does not impact these provisions.

3. Clean Air Act

EPCA states that fuel economy tests shall to the extent practicable be carried out with the emissions tests required under Section 206 of the Clean Air Act § 32904(c). This final rule incorporates three additional emissions tests, required under the Clean Air Act regulations, for fuel economy testing, as discussed in detail in Section II. We are also making several changes to existing emissions tests. These changes are being finalized under the authority of Section 206 of the Clean Air Act, which permits the Administrator to define, and to

[76] See 49 U.S.C. 32901(a)(10).

[77] See 49 U.S.C. 32908(c).

[78] Id.

[79] See Pub. L. 109–58.

[80] More commonly known as the Monroney Act (Senator Mike Monroney was the chief sponsor of the Act) or Price Sticker Act. See 15 U.S.C. 1231–1233.

[81] See 49 U.S.C. 32908(b)(2).

revise from time to time, the test procedures used to determine compliance with applicable emission standards.

4. Additional Provisions in the Energy Policy Act of 2005 and Transportation Equity Act of 2005

This action is expected to have no impact on the federal income tax credits for consumers who purchase new hybrid, diesel, dedicated alternative fuel, or fuel cell vehicles that meet certain eligibility requirements beginning on January 1, 2006 that the Internal Revenue Service (IRS) has established under Section 1341 of the Energy Policy Act of 2005.[82] IRS uses ''unadjusted'' laboratory FTP (city) fuel economy test values to determine tax credit eligibility for light-duty vehicles. Accordingly, the changes being finalized today for ''adjusted'' fuel economy values will have no impact on the tax credit program.

Similarly, this action is expected to have no impact on the ''High Occupancy Vehicle (HOV) Facilities'' regulations EPA is establishing under Section 1121 of the Transportation Equity Act of 2005. EPA is in the process of developing proposed regulations to identify low emission and energy-efficient vehicles for the purpose of assisting states administering high-occupancy vehicle facility transportation plans. EPA anticipates that the fuel economy values used to identify these vehicles will be the ''unadjusted'' FTP-based fuel economy test values. Accordingly, the changes in this final rule are anticipated to have no impact on the HOV facilities program.

5. Federal Trade Commission Guide Concerning Fuel Economy Advertising for New Vehicles

In the mid-1970's when EPCA was passed, the Federal Trade Commission (FTC) ''took note of the dramatic increase in the number of fuel economy claims then being made and of the proliferation of test procedures then being used as the basis for such claims.'' [83] They responded by promulgating regulations in 16 CFR part 259 entitled ''Guide Concerning Fuel Economy Advertising for New Vehicles'' (''Fuel Guide''). The Fuel Guide, adopted in 1975 and subsequently revised twice,[84] provides guidance to automobile manufacturers to prevent deceptive advertising and to facilitate the use of fuel economy information in advertising. The Fuel Guide advises vehicle manufacturers and dealers how to disclose the established fuel economy of a vehicle, as determined by the Environmental Protection Agency's rules pursuant to the Automobile Information Disclosure Act (15 U.S.C. 2996), in advertisements that make representations regarding the fuel economy of a new vehicle. The disclosure is tied to the claim made in the advertisement. If both city and highway fuel economy claims are made, both city and highway EPA figures should be disclosed. A claim regarding either city or highway fuel economy should be accompanied by the corresponding EPA figure. A general fuel economy claim would trigger disclosure of the EPA city figure, although the advertiser would be free to state the highway figure as well. The authority for the Fuel Guide is tied to the Federal Trade Commission Act (15 U.S.C. 41–58) which, briefly stated, makes it illegal for one to engage in ''unfair methods of competition in or affecting commerce and unfair or deceptive acts or practices in or affecting commerce.''

VIII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order (EO) 12866 (58 FR 51735, October 4, 1993), this action is a ''significant regulatory action.'' Pursuant to the terms of Executive Order 12866, OMB has notified EPA that it considers this a ''significant regulatory action'' within the meaning of the Executive Order. Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under EO 12866 and any changes made in response to OMB recommendations have been documented in the docket for this action.

In addition, EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis is contained in the Technical Support Document. A copy of the analysis is available in the docket for this action and the analysis is summarized in Section VI of this document.

B. Paperwork Reduction Act

The information collection requirements in this rule have been submitted for approval to OMB under the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* The information collection requirements are not enforceable until OMB approves them.

The information being collected is used by EPA to calculate the fuel economy estimates that appear on new automobile and light truck (and, starting with model year 2011, medium-duty passenger vehicle) sticker labels. EPA currently collects this information annually as part of its vehicle certification and fuel economy program, and will continue to do so. This final rule changes some of the content of the information submitted. Responses to this information collection are mandatory to obtain the benefit of vehicle certification under Title II of the Clean Air Act (42 U.S.C. 7521 *et seq.*) and as required under Title III of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 2001 *et seq.*). Information submitted by manufacturers is held as confidential until the specific vehicle to which it pertains is available for purchase. After vehicles are available for purchase, most information associated with the manufacturer's application is available to the public. Under section 208 of the Clean Air Act (42 U.S.C. 7542(c)), all information, other than trade secret processes or methods, must be publicly available. Proprietary information is granted confidentiality in accordance with the Freedom of Information Act, EPA regulations at 40 CFR part 2, and class determinations issued by EPA's Office of General Counsel.

The projected increased cost within the three-year horizon of the pending information collection request is $747,830 in one-time startup costs, after being annualized and discounted at 7%. No increase in other capital costs, or in operations and maintenance or labor costs, are anticipated during this period. The estimated number of likely respondent manufacturers is 35. Responses are submitted annually by engine family, with the number of responses per respondent varying widely depending on the number of engine families being certified. Under the current information authorization, an average of 8.4 responses a year are approved for each of 35 respondents requiring 549.2 hours per response and 56.6 hours of recordkeeping at a total cost of $46,427 per response for an industry total of 178,109 hours and $14.2 million annually, including capital, operations and maintenance, and labor costs. This rule will increase this burden by 0 hours and $747,830 per year during the next three years (high estimate) for an industry total of $14.9 million annually.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a

[82] See Pub. L. 109–58.

[83] See 40 FR 42003 (Sept. 10, 1975).

[84] See 43 FR 55747 (Nov. 29, 1978); and 60 FR 56230 (Nov. 8, 1995).

Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9. When this ICR is approved by OMB, the Agency will publish a technical amendment to 40 CFR part 9 in the **Federal Register** to display the OMB control number for the approved information collection requirements contained in this final rule.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this final rule on small entities, a small entity is defined as: (1) A small business as defined by the Small Business Administration (SBA) by category of business using North America Industrial Classification System (NAICS) and codified at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. A small business that manufactures automobiles has a NAICS code of 336111. Based on Small Business Administration size standards, a small business for this NAICS code is defined as a manufacturer having less than 1000 employees. Out of a total of approximately 80 automotive manufacturers subject to this final rule, EPA estimates that approximately 10 of these could be classified as small entities based on SBA size standards. Unlike large manufacturers with complex and diverse product lines, we expect that the small entities (generally these are vehicle importers and vehicle converters) will be able use the results of tests they are already conducting for emissions compliance to satisfy the proposed fuel economy labeling requirements. Therefore, we expect that these small entities will face minimal additional burden due to the new fuel economy labeling requirements.

Independent Commercial Importers (ICIs) have averaged about 50 imported engine families per year for the last three model years. There are approximately 10 ICIs subject to this final rule. If we assume that the ICIs and other small entities account for five percent of the vehicle models for which fuel economy labels are needed (a proportion that is certainly an overestimate, but useful for placing an upper bound on the estimated cost impacts for small entities), then these entities must generate about 65 different fuel economy labels. Using the total estimated costs from Section V of this preamble, the average annual cost per labeled vehicle configuration is about $1,280–1,760, and the total annual cost for 20 small entities can be estimated to be $85,000–114,000. The total average annual cost for an individual importer or small manufacturer can therefore be estimated to be a maximum of $4,250–5,700. We have recently collected data on the currently operating small entities in the ICI and vehicle conversion categories; this data indicates that the average annual revenue for these companies is approximately $4.8 million. Therefore, the projected cost increase is a maximum of 0.12 percent of the average revenue for small importers or manufacturers. Because of the limited range of vehicle configurations typically offered by these small entities, we believe that the maximum cost for these entities will be even lower than the low end of the ranges shown above. Our methodology for estimating costs in Section V assumes that manufacturers have diverse product lines, and thus ultimately will need to perform some level of additional testing in 2011 and later model years. Using costs based on such an assumption will tend to overestimate costs for ICIs and vehicle converters, who typically produce or import a single model or configuration.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for federal agencies to assess the effects of their regulatory actions on state, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''federal mandates'' that may result in expenditures to state, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives, and to adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation of why that alternative was not adopted.

Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

This rule contains no federal mandates for state, local, or tribal governments as defined by the provisions of Title II of the UMRA. The rule imposes no enforceable duties on any of these governmental entities. Nothing in the rule would significantly or uniquely affect small governments.

We have determined that this rule does not contain a federal mandate that may result in expenditures of more than $100 million to the private sector in any single year. We believe that this rule represents the least costly, most cost effective approach to achieve the goals

of the final rule. The costs are discussed in Section V and in the Technical Support Document. Thus, this final rule is not subject to the requirements of sections 202 and 205 of the UMRA.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

This final rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Thus, Executive Order 13132 does not apply to this rule.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 6, 2000), requires EPA to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.''

This final rule does not have tribal implications as specified in Executive Order 13175. This rule will be implemented at the Federal level and impose compliance costs only on motor vehicle manufacturers. Tribal governments will be affected only to the extent they purchase and use motor vehicles. Thus, Executive Order 13175 does not apply to this rule.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

Executive Order 13045: ''Protection of Children From Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency. EPA interprets Executive Order 13045 as applying only to those regulatory actions that are based on health or safety risks, such that the analysis required under section 5–501 of the Order has the potential to influence the regulation. This final rule is not subject to Executive Order 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355 (May 22, 2001)) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. The regulations do not require manufacturers to improve or otherwise change the fuel economy of their vehicles. The purpose of this regulation is to provide consumers with better information on which to base their vehicle purchasing decisions. Therefore, we have concluded that this rule is not likely to have any adverse energy effects.

I. National Technology Transfer Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Public Law 104–113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This rulemaking does not involve technical standards. Therefore, EPA is not considering the use of any voluntary consensus standards.

J. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2). This rule will be effective on January 26, 2007.

IX. Statutory Provisions and Legal Authority

Statutory authority for the fuel economy labeling program can be found in 42 U.S.C. 7401–7671q, 49 U.S.C. 32901–32917, and Pub. L. 109–58.

List of Subjects

40 CFR Part 86

Administrative practice and procedure, Confidential business information, Incorporation by reference, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements.

40 CFR Part 600

Administrative practice and procedure, Electric power, Fuel economy, Incorporation by reference, Labeling, Reporting and recordkeeping requirements.

Dated: December 11, 2006.

Stephen L. Johnson,

Administrator.

■ For the reasons set forth in the preamble, parts 86 and 600 of title 40, Chapter I of the Code of Federal Regulations is amended as follows:

PART 86—CONTROL OF EMISSIONS FROM NEW AND IN-USE HIGHWAY VEHICLES AND ENGINES

■ 1. The authority citation for part 86 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

■ 2. The table of references in § 86.1(b)(1) is amended by revising the entry for ''ASTM D 975–04c Standard Specification for Diesel Fuel Oils'' to read as follows:

§ 86.1 Reference materials.

* * * * *

(b) * * *

(1) * * *

Document No. and name	40 CFR part 86 reference
* * * * *	
ASTM D 975–04c Standard Specification for Diesel Fuel Oils.	86.1910, 86.213–11.

Subpart B—[Amended]

■ 3. A new § 86.158–08 is added to read as follows:

§ 86.158–08 Supplemental Federal Test Procedures; overview.

The procedures described in §§ 86.158–08, 86.159–08, 86.160–00, and 86.162–00 discuss the aggressive driving (US06) and air conditioning (SC03) elements of the Supplemental Federal Test Procedures (SFTP). These test procedures consist of two separable test elements: A sequence of vehicle operation that tests exhaust emissions with a driving schedule (US06) that tests exhaust emissions under high speeds and accelerations (aggressive driving); and a sequence of vehicle operation that tests exhaust emissions with a driving schedule (SC03) which includes the impacts of actual air conditioning operation. These test procedures (and the associated standards set forth in subpart S of this part) are applicable to light-duty vehicles and light-duty trucks.

(a) Vehicles are tested for the exhaust emissions of THC, CO, NO_X, CH_4, and CO_2. For diesel-cycle vehicles, THC is sampled and analyzed continuously according to the provisions of § 86.110.

(b) Each test procedure follows the vehicle preconditioning specified in § 86.132–00.

(c) *US06 Test Cycle.* The test procedure for emissions on the US06 driving schedule (see § 86.159–08) is designed to determine gaseous exhaust emissions from light-duty vehicles and light-duty trucks while simulating high speed and acceleration on a chassis dynamometer (aggressive driving). The full test consists of preconditioning the engine to a hot stabilized condition, as specified in § 86.132–00, and an engine idle period of 1 to 2 minutes, after which the vehicle is accelerated into the US06 cycle. A proportional part of the diluted exhaust is collected continuously for subsequent analysis, using a constant volume (variable dilution) sampler or critical flow venturi sampler. Optionally, as specified in § 86.159–08 and in part 600 of this chapter, a proportional part of the diluted exhaust may be collected continuously in two bag samples, one representing US06 City driving and the other representing US06 Highway driving. If two bag samples are collected, for petroleum-fueled diesel-cycle vehicles for which THC is sampled and analyzed continuously according to the provisions of § 86.110, the analytical system shall be configured to calculate THC for the US06 City phase and the US06 Highway phase as described in § 86.159–08.

(d) *SC03 Test Cycle.* The test procedure for determining exhaust emissions with the air conditioner operating (see § 86.160–00) is designed to determine gaseous exhaust emissions from light-duty vehicles and light-duty trucks while simulating an urban trip during ambient conditions of 95 °F, 100 grains of water/pound of dry air (approximately 40 percent relative humidity), and a solar heat load intensity of 850 W/m^2. The full test consists of vehicle preconditioning (see § 86.132–00 paragraphs (o)(1) and (2)), an engine key-off 10 minute soak, an engine start, and operation over the SC03 cycle. A proportional part of the diluted exhaust is collected continuously during the engine start and the SC03 driving cycle for subsequent analysis, using a constant volume (variable dilution) sampler or critical flow venturi sampler.

(e) The emission results from the aggressive driving test (§ 86.159–08), air conditioning test (§ 86.160–00), and FTP test (§ 86.130–00 (a) through (d) and (f)) (conducted on a large single roll or equivalent dynamometer) are analyzed according to the calculation methodology in § 86.164–08 and compared to the applicable SFTP emission standards in subpart S of this part.

(f) These test procedures may be run in any sequence that maintains the applicable preconditioning elements specified in § 86.132–00.

■ 4. A new § 86.159–08 is added to read as follows:

§ 86.159–08 Exhaust emission test procedures for US06 emissions.

(a) *Overview.* The dynamometer operation consists of a single, 600 second test on the US06 driving schedule, as described in appendix I, paragraph (g), of this part. The vehicle is preconditioned in accordance with § 86.132–00, to bring it to a warmed-up stabilized condition. This preconditioning is followed by a 1 to 2 minute idle period that proceeds directly into the US06 driving schedule during which continuous proportional samples of gaseous emissions are collected for analysis. US06 emissions may optionally be collected in two bag samples representing US06 City and US06 Highway emissions, as provided for in this section and in part 600 of this chapter. Emissions from seconds 0–130 and seconds 495–596 are collected in one bag to represent US06 City emissions, and emissions from seconds 130–495 are collected in a second bag to represent US06 Highway emissions. If engine stalling should occur during cycle operation, follow the provisions of § 86.136–90 (engine starting and restarting). For gasoline-fueled Otto-cycle vehicles, the composite samples collected in bags are analyzed for THC, CO, CO_2, CH_4, and NO_X. For petroleum-fueled diesel-cycle vehicles, THC is sampled and analyzed continuously according to the provisions of § 86.110. Parallel bag samples of dilution air are analyzed for THC, CO, CO_2, CH_4, and NO_X.

(b) *Dynamometer activities.* (1) All official US06 tests shall be run on a large single roll electric dynamometer, or an approved equivalent dynamometer configuration, that satisfies the requirements of § 86.108–00.

(2) Position (vehicle can be driven) the test vehicle on the dynamometer and restrain.

(3) Required US06 schedule test dynamometer inertia weight class selections are determined by the test vehicles test weight basis and corresponding equivalent weight as listed in the tabular information of § 86.129–94(a) and discussed in § 86.129–00 (e) and (f).

(4) Set the dynamometer test inertia weight and roadload horsepower requirements for the test vehicle according to § 86.129–00 (e) and (f). The dynamometer's horsepower adjustment settings shall be set to match the force imposed during dynamometer operation with actual road load force at all speeds.

(5) The vehicle speed as measured from the dynamometer rolls shall be used. A speed vs. time recording, as evidence of dynamometer test validity, shall be supplied on request of the Administrator.

(6) The drive wheel tires may be inflated up to a gauge pressure of 45 psi (310 kPa), or the manufacturer's recommended pressure if higher than 45 psi, in order to prevent tire damage. The drive wheel tire pressure shall be reported with the test results.

(7) The driving distance, as measured by counting the number of dynamometer roll or shaft revolutions, shall be determined for the test.

(8) Four-wheel drive and all-wheel drive vehicles may be tested either in a four-wheel drive or a two-wheel drive mode of operation. In order to test in the two-wheel drive mode, four-wheel drive and all-wheel drive vehicles may have one set of drive wheels disengaged; four-wheel and all-wheel drive vehicles which can be shifted to a two-wheel mode by the driver may be tested in a two-wheel drive mode of operation.

(9) During dynamometer operation, a fixed speed cooling fan with a maximum discharge velocity of 15,000 cfm will be positioned so as to direct cooling air to the vehicle in an appropriate manner with the engine compartment cover open. In the case of vehicles with front engine compartments, the fan shall be positioned within 24 inches (61 centimeters) of the vehicle. In the case of vehicles with rear engine compartments (or if special designs make the above impractical), the cooling fan(s) shall be placed in a position to provide sufficient air to maintain vehicle cooling. The Administrator may approve modified cooling configurations or additional cooling if necessary to satisfactorily perform the test. In approving requests for additional or modified cooling, the Administrator will consider such items as actual road cooling data and whether such additional cooling is needed to provide a representative test.

(c) The flow capacity of the CVS shall be large enough to virtually eliminate water condensation in the system.

(d) Practice runs over the prescribed driving schedule may be performed at test point, provided an emission sample is not taken, for the purpose of finding the appropriate throttle action to maintain the proper speed-time relationship, or to permit sampling system adjustment.

(e) Perform the test bench sampling sequence outlined in § 86.140–94 prior to or in conjunction with each series of exhaust emission measurements.

(f) *Test activities.* (1) The US06 consists of a single test which is directly preceded by a vehicle preconditioning in accordance with § 86.132–00. Following the vehicle preconditioning, the vehicle is idled for not less than one minute and not more than two minutes. The equivalent dynamometer mileage of the test is 8.0 miles (1.29 km).

(2) The following steps shall be taken for each test:

(i) Immediately after completion of the preconditioning, idle the vehicle. The idle period is not to be less than one minute or greater than two minutes.

(ii) With the sample selector valves in the ''standby'' position, connect evacuated sample collection bags to the dilute exhaust and dilution air sample collection systems.

(iii) Start the CVS (if not already on), the sample pumps, the temperature recorder, the vehicle cooling fan, and the heated THC analysis recorder (diesel-cycle only). The heat exchanger of the constant volume sampler, if used, petroleum-fueled diesel-cycle THC analyzer continuous sample line should be preheated to their respective operating temperatures before the test begins.

(iv) Adjust the sample flow rates to the desired flow rate and set the gas flow measuring devices to zero.

(A) For gaseous bag samples (except THC samples), the minimum flow rate is 0.17 cfm (0.08 liters/sec).

(B) For THC samples, the minimum FID (or HFID in the case of diesel-cycle vehicles) flow rate is 0.066 cfm (0.031 liters/sec).

(C) CFV sample flow rate is fixed by the venturi design.

(v) Attach the exhaust tube to the vehicle tailpipe(s).

(vi) Start the gas flow measuring device, position the sample selector valves to direct the sample flow into the exhaust sample bag, the dilution air sample bag, turn on the petroleum-fueled diesel-cycle THC analyzer system integrator, mark the recorder chart, and record both gas meter or flow measurement instrument readings, (if applicable).

(vii) Place vehicle in gear after starting the gas flow measuring device, but prior to the first acceleration. Begin the first acceleration 5 seconds after starting the measuring device.

(viii) Operate the vehicle according to the US06 driving schedule, as described in appendix I, paragraph (g), of this part. Manual transmission vehicles shall be shifted according to the manufacturer recommended shift schedule, subject to review and approval by the Administrator. For further guidance on transmissions see § 86.128–00.

(ix) Paragraphs (f)(2)(ix)(A) and (B) of this section apply to vehicles for which the manufacturer is collecting US06 City and US06 Highway emissions for subsequent analysis according to the provisions of part 600 of this chapter. Vehicles for which emissions are being collected in a single continuous sample for subsequent analysis must be tested according to paragraph (x) of this section, and this paragraph (f)(2)(ix) will not apply.

(A) At two seconds after the end of the deceleration which is scheduled to occur at 128 seconds (*i.e.*, at 130 seconds), simultaneously switch the sample flows from the ''US06 City'' bags and samples to the ''US06 Highway'' bags and samples, switch gas flow measuring device No. 1 (and the petroleum-fueled diesel hydrocarbon integrator No. 1 and mark the petroleum-fueled diesel hydrocarbon recorder chart if applicable) to ''standby'' mode, and start gas flow measuring device No. 2 (and the petroleum-fueled diesel hydrocarbon integrator No. 2 if applicable). Before the acceleration which is scheduled to occur at 136 seconds, record the measured roll or shaft revolutions.

(B) At two seconds after the end of the deceleration which is scheduled to occur at 493 seconds (i.e., at 495 seconds), simultaneously switch the sample flows from the ''US06 Highway'' bags and samples to the ''US06 City'' bags and samples, switch off gas flow measuring device No. 2 (and the petroleum-fueled diesel hydrocarbon integrator No. 2 and mark the petroleum-fueled diesel hydrocarbon recorder chart if applicable), and start gas flow measuring device No. 1 (and the petroleum-fueled diesel hydrocarbon integrator No. 1 if applicable). Before the acceleration which is scheduled to occur at 500 seconds, record the measured roll or shaft revolutions and the No. 2 gas meter reading or flow measurement instrument. As soon as possible transfer the ''US06 Highway'' exhaust and dilution air bag samples to the analytical system and process the samples according to § 86.140–94 obtaining a stabilized reading of the bag exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test.

(x) Turn the engine off 2 seconds after the end of the last deceleration (i.e., engine off at 596 seconds).

(xi) Five seconds after the engine stops running, simultaneously turn off gas flow measuring device No. 1 (and the petroleum-fueled diesel hydrocarbon integrator No. 1 and mark the petroleum-fueled diesel hydrocarbon recorder chart if applicable) and position the sample selector valves to the ''standby'' position. Record the measured roll or shaft revolutions and the No. 1 gas meter reading or flow measurement instrument.

(xii) As soon as possible, transfer the exhaust and dilution air bag samples (or the US06 City exhaust and dilution air bag samples, if applicable) to the analytical system and process the samples according to § 86.140–94 obtaining a stabilized reading of the bag exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test.

(xiii) Immediately after the end of the sample period, turn off the cooling fan, close the engine compartment cover, disconnect the exhaust tube from the vehicle tailpipe(s), and drive the vehicle from dynamometer.

(xiv) The CVS or CFV may be turned off, if desired.

■ 5. A new § 86.164–08 is added to read as follows:

§ 86.164–08 Supplemental Federal Test Procedure calculations.

(a) The provisions of § 86.144–94 (b) and (c) are applicable to this section except that the NO_X humidity correction factor of § 86.144–94(c)(7)(iv) must be modified when adjusting SC03 environmental test cell NO_X results to 100 grains of water according to paragraph (d) of this section. These provisions provide the procedures for calculating mass emission results of each regulated exhaust pollutant for the test schedules of FTP, US06, and SC03.

(b) The provisions of § 86.144–94(a) are applicable to this section. These provisions provide the procedures for determining the weighted mass emissions for the FTP test schedule (Y_{wm}).

(c)(1) When the test vehicle is equipped with air conditioning, the final reported test results for the SFTP composite (NMHC+NO_X) and optional composite CO standards shall be computed by the following formulas.

(i) $Y_{WSFTP} = 0.35(Y_{FTP}) + 0.37(Y_{SC03}) + 0.28(Y_{US06})$

Where:

(A) Y_{WSFTP} = Mass emissions per mile for a particular pollutant weighted in terms of the contributions from the FTP, SC03, and US06 schedules. Values of Y_{WSFTP} are obtained for each of the exhaust emissions of NMHC, NO_X and CO.

(B) Y_{FTP} = Weighted mass emissions per mile (Y_{WM}) based on the measured driving distance of the FTP test schedule.

(C) Y_{SC03} = Calculated mass emissions per mile based on the measured driving distance of the SC03 test schedule.

(D)(*1*) Y_{US06} = Calculated mass emissions per mile based on the measured driving distance of the US06 test schedule; or,

(*2*) In the case of a 2-phase US06 test run according to the provisions of § 86.159–08(f)(2)(ix) and part 600 of this chapter:

Y_{US06} = Calculated mass emissions per mile, using the summed mass emissions of the ''US06 City'' phase (sampled during seconds 1–130 and seconds 495–596 of the US06 driving schedule) and the ''US06 Highway'' phase (sampled during seconds 130–495 of the US06 driving schedule), based on the measured driving distance of the US06 test schedule.

(ii) Composite (NMHC+NO_X) = Y_{WSFTP}(NMHC) + Y_{WSFTP}(NO_X)

Where:

(A) Y_{WSFTP}(NMHC) = results of paragraph (c)(1)(i) of this section for NMHC.

(B) Y_{WSFTP}(NO_X) = results of paragraph (c)(1)(i) of this section for NO_X.

(2) When the test vehicle is not equipped with air conditioning, the final reported test results for the SFTP composite (NMHC+NO_X) and optional composite CO standards shall be computed by the following formulas.

(i) $Y_{WSFTP} = 0.72(Y_{FTP})+0.28(Y_{US06})$

Where:

(A) Y_{WSFTP} = Mass emissions per mile for a particular pollutant weighted in terms of the contributions from the FTP and US06 schedules. Values of Y_{WSFTP} are obtained for each of the exhaust emissions of NMHC, NO_X and CO.

(B) Y_{FTP} = Weighted mass emissions per mile (Ywm) based on the measured driving distance of the FTP test schedule.

(C)(*1*) Y_{US06} = Calculated mass emissions per mile based on the measured driving distance of the US06 test schedule; or,

(*2*) In the case of a 2-phase US06 test run according to the provisions of § 86.159–08(f)(2)(ix) and part 600 of this chapter:

Y_{US06} = Calculated mass emissions per mile, using the summed mass emissions of the ''US06 City'' phase (sampled during seconds 1–130 and seconds 495–596 of the US06 driving schedule) and the ''US06 Highway'' phase (sampled during seconds 130–495 of the US06 driving schedule), based on the measured driving distance of the US06 test schedule.

(ii) Composite (NMHC+NO_X) = Y_{WSFTP}(NMHC) + Y_{WSFTP}(NO_X)

Where:

(A) Y_{WSFTP}(NMHC) = results of paragraph (c)(2)(i) of this section for NMHC.

(B) Y_{WSFTP}(NO_X) = results of paragraph (c)(2)(i) of this section for NO_X.

(d) The NO_X humidity correction factor for adjusting NO_X test results to the environmental test cell air conditioning ambient condition of 100 grains of water/pound of dry air is:

K_H (100) = 0.8825/[1–0.0047(H–75)]

Where:

H = measured test humidity in grains of water/pound of dry air.

Subpart C—[Amended]

■ 6. A new § 86.201–11 is added to read as follows:

§ 86.201–11 General applicability.

(a) This subpart describes procedures for determining the cold temperature carbon monoxide (CO) emissions from 1994 and later model year new gasoline-fueled light-duty vehicles and light-duty trucks, and for emissions sampling for determining fuel economy according to part 600 of this chapter for 2011 and later model year new gasoline-fueled and diesel-fueled light-duty vehicles and light-duty trucks.

(b) All of the provisions of this subpart are applicable to testing conducted at a nominal temperature of 20 °F (−7 °C).

(c) The provisions that are specifically applicable to testing at temperatures between 25 °F (−4 °C) and 68 °F (20 °C) are specified in § 86.246–94 of this subpart.

■ 7. A new § 86.205–11 is added to read as follows:

§ 86.205–11 Introduction; structure of this subpart.

(a) This subpart describes the equipment required and the procedures to follow in order to perform gaseous exhaust emission tests on gasoline-fueled and petroleum-fueled diesel cycle (where applicable under part 600 of this chapter) light-duty vehicles and light-duty trucks. Subpart A of this part sets forth testing requirements and test intervals necessary to comply with EPA certification procedures.

(b) A section reference without a model year suffix refers to the section applicable for the appropriate model years.

(c) Three topics are addressed in this subpart. Sections 86.206 through 86.215 set forth specifications and equipment requirements; §§ 86.216 through 86.226 discuss calibration methods and frequency; test procedures and data requirements are listed (in approximate order of performance) in §§ 86.227 through 86.245.

■ 8. A new § 86.206–11 is added to read as follows:

§ 86.206–11 Equipment required; overview.

This subpart contains procedures for exhaust emission tests on gasoline-fueled and petroleum-fueled diesel cycle (where applicable under part 600 of this chapter) light-duty vehicles and light-duty trucks. Equipment required and specifications are as follows:

(a) *Exhaust emission tests.* Exhaust from gasoline-fueled and petroleum-fueled diesel cycle (where applicable under part 600 of this chapter) vehicles is tested for gaseous emissions using the Constant Volume Sampler (CVS) concept (§ 86.209). Equipment necessary and specifications appear in §§ 86.208 through 86.214.

(b) *Fuel, analytical gas, and driving schedule specifications.* Fuel specifications for exhaust emission testing for gasoline-fueled and petroleum-fueled diesel cycle vehicles are specified in § 86.213. Analytical gases are specified in § 86.214. The EPA Urban Dynamometer Driving Schedule

(UDDS) for use in gasoline-fueled emission tests is specified in § 86.115 and Appendix I to this part.

■ 9. A new § 86.210–08 is added to read as follows:

§ 86.210–08 Exhaust gas sampling system; Diesel-cycle vehicles not requiring particulate emissions measurements.

(a) *General applicability.* The exhaust gas sampling system requirements of § 86.109–4 (which apply to Otto-cycle vehicles), also apply to diesel vehicles that are not required to undergo particulate measurement as allowed under § 600.111–08(e) of this chapter, except that heated flame ionization detector (HFID), probe, sample lines and filters are required as described below.

(1) Petroleum-fueled diesel-cycle vehicles require a heated flame ionization detector (HFID) (375 °±20 °F (191 °±11 °C)) sample for total hydrocarbon (THC) analysis. The HFID sample must be taken directly from the diluted exhaust stream through a heated probe and continuously integrated measurement of diluted THC is required. Unless compensation for varying mass flow is made, a constant mass flow system must be used to ensure a proportional THC measurement.

(2) For natural gas-fueled and liquefied petroleum gas-fueled diesel vehicles either a heated flame ionization detector (HFID) [375°±20 °F (191°±11 °C)] or a non-heated flame ionization detector may be used for hydrocarbon analysis.

(3) Other sampling systems may be used if shown to yield equivalent or superior results and if approved in advance by the Administrator.

(b) *Component description.* The components necessary for petroleum-fueled diesel vehicle exhaust sampling shall meet the following requirements:

(1) The PDP system shall conform to all of the requirements listed for the exhaust gas PDP-CVS (§ 86.109–94(a)(3)).

(2) The CFV-CVS sample system shall conform to all of the requirements listed for the exhaust gas EFC sample system (§ 86.109–94(a)(5)).

(3) The THC probe (when the THC probe is required) shall be:

(i) Installed at a point where the dilution air and exhaust are well mixed.

(ii) Heated and insulated over the entire length to maintain a 375 °±20 °F (191 °±11 °C) wall temperature.

(iii) 0.19 in. (0.48 cm) minimum inside diameter.

(4) It is intended that the THC probe be free from cold spots (i.e., free from spots where the probe wall temperature is less than 355 °F). This will be determined by a temperature sensor located on a section of the probe wall outside of the walls of the sampling system. The temperature sensor shall be insulated from any heating elements on the probe. The sensor shall have an accuracy and precision of ±2 °F (1.1 °C).

(5) The dilute exhaust gas flowing in the THC sample system shall be:

(i) At 375 °F±10 °F (191 °C±6 °C) immediately before the heated filter. This will be determined by a temperature sensor located immediately upstream of the filter. The sensor shall have an accuracy and precision of ±2 °F (1.1 °C).

(ii) At 375 °F±10 °F (191 °C ±6 °C) immediately before the HFID. This will be determined by a temperature sensor located at the exit of the heated sample line. The sensor shall have an accuracy and precision of ±2 °F (1.1 °C).

(6) It is intended that the dilute exhaust gas flowing in the THC sample system be between 365 °F and 385 °F (185 °C and 197 °C).

(7) The requirements for the continuous HC measurement system are as follows:

(i) The system must use an ''overflow'' zero and span system. In this type of system, excess zero or span gas spills out of the probe when zero and span checks of the analyzer are made. The ''overflow'' system may also be used to calibrate the HC analyzer per § 86.1321(b), although this is not required.

(ii) No other analyzers may draw a sample from the continuous HC sample probe, line or system, unless a common sample pump is used for all analyzers and the sample line system design reflects good engineering practice.

(iii) The overflow gas flow rates into the sample line shall be at least 105% of the sample system flow rate.

(iv) The overflow gases shall enter the heated sample line as close as practicable to the outside surface of the CVS duct or dilution tunnel.

■ 10. Section 86.211–94 is revised to read as follows:

§ 86.211–94 Exhaust gas analytical system.

The provisions of § 86.111–94 apply to this subpart, except that the NO_X analyzer is optional. The exhaust gas analytical system must contain components necessary to determine hydrocarbons, carbon monoxide, carbon dioxide, methane, and formaldehyde. The exhaust gas analytical system is not required to contain components necessary for determining oxides of nitrogen.

■ 11. A new § 86.213–11 is added to read as follows:

§ 86.213–11 Fuel specifications.

(a) *Gasoline-fueled light-duty vehicles and light-duty trucks.* Gasoline having the following specifications will be used by the Administrator except that the Administrator will not use gasoline having a sulfur specification higher than 0.0045 weight percent. Gasoline having the specifications set forth in the table in this section, or substantially equivalent specifications approved by the Administrator, may be used by the manufacturer except that the octane specification does not apply. In lieu of using gasoline having these specifications, the manufacturer may, for certification testing, use gasoline having the specifications specified in § 86.113–04 provided the cold CO emissions are not decreased. Documentation showing that cold CO emissions are not decreased must be maintained by the manufacturer and must be made available to the Administrator upon request. The table listing the cold CO fuel specifications described in the text in this section follows:

TABLE—COLD CO FUEL SPECIFICATIONS

Item	ASTM test	Cold CO low octane value or range	Cold CO high octane [1] value or range
(RON+MON)/2, min	D 2699	87.8±.3	92.3±0.5.
Sensitivity, min	D 2699	7.5	7.5.
Distillation range:			
IBP, deg.F	D 86	76–96	76–96.
10% point, deg.F	D 86	98–118	105–125.
50% point, deg.F	D 86	179–214	195–225.
90% point, deg.F	D 86	316–346	316–346.

TABLE—COLD CO FUEL SPECIFICATIONS—Continued

Item	ASTM test	Cold CO low octane value or range	Cold CO high octane [1] value or range
EP, max, deg.F	D 86	413	413.
Sulfur, wt. %	D 3120	0.0015–0.008	0.0015–0.008.
Phosphorous, g/U.S gal, max	D 3231	0.005	0.005.
Lead, g/gal, max		0.01	0.01.
RVP, psi	D 4953	11.5±.3	11.5±.3.
Hydrocarbon composition	D 1319.		
Olefins, vol. pct		12.5±5.0	10.0±5.0.
Aromatics, vol. pct		26.4±4.0	32.0±4.0.
Saturates		Remainder	Remainder.

[1] Gasoline having these specifications may be used for vehicles which are designed for the use of high-octane premium fuel.

(b) *Petroleum-fueled diesel-cycle light-duty vehicles and light-duty trucks.* Diesel test fuel used for cold temperature FTP testing under part 600 of this chapter must be a winter-grade diesel fuel as specified in ASTM D975–04c ''Standard Specification for Diesel Fuel Oils.'' (incorporated by reference, see § 86.1) Such test fuel must also comply with the requirements of part 80 of this chapter. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* The Administrator may approve the use of a different diesel test fuel, provided that the level of kerosene added shall not exceed 20 percent.

■ 12. A new § 86.230–11 is added to read as follows:

§ 86.230–11 Test sequence: general requirements.

(a) *Sequence steps.* Figure C94–1 of § 86.230–94 shows the steps encountered as the test vehicle undergoes the procedures subsequently described, to determine conformity with the standards set forth.

(b) *Driving schedule.* The Urban Dynamometer Driving Schedule (UDDS) test procedure (see § 86.115 and appendix I to this part) is used for vehicle preconditioning and testing.

(c) *Ambient temperature level.* (1) Ambient temperature levels encountered by the test vehicle shall average 20 ° ±5 °F (−7 °C ±2.8 °C) and shall not be less than 10 °F (−14 °C) nor more than 30 °F (−1 °C) during vehicle preconditioning, except for preconditioning performed in accordance with § 86.232(a)(7), and during all emission testing.

(2) The ambient temperature reported shall be a simple average of the test cell temperatures measured at constant intervals no more than one minute apart. Before the driving cycle may begin, the test cell temperature shall be 20 °F ±3 °F (−7 °C ±1.7 °C) when measured in accordance with paragraph (e)(2) of this section. The temperature may not exceed 25 °F (−4 °C) or fall below 15 °F (−9 °C) for more than three consecutive minutes during the test.

(d) *Vehicle positioning.* The vehicle shall be approximately level during all phases of the test sequence to prevent abnormal fuel distribution.

(e) *Engine compartment cooling.* (1) Fixed speed air cooling of the engine compartment with the compartment cover open shall be utilized during testing that is conducted by the Administrator and, optionally for certification testing, by the manufacturer. If a separate movable fan is used, it shall be squarely positioned within 12 inches (30.5 centimeters) of the front of vehicles with front engine compartments. In the case of vehicles with rear engine compartments (or if special designs make the normal front engine positioning impractical), the cooling fan shall be placed in a position to provide sufficient air to maintain vehicle cooling. The fan capacity shall normally not exceed 5,300 cfm (2.50 cubic meters per second). If, however, the manufacturer showed (as provided in § 86.135–94(b)) that additional cooling is necessary, the fan capacity may be increased or additional fans used if approved in advance by the Administrator. The cooling air temperature shall be measured at the inlet to the fan.

(2) In lieu of using a separate fan, an air handling system that is integral with the test cell may be used provided comparable air movement is obtained. The cooling air temperature shall be measured in the center of a vertical plane that is located approximately 2 feet in front of the vehicle.

(3) The manufacturer may use, for certification testing, alternative engine compartment cooling fans or systems, including those which provide a variable air flow, if the manufacturer has determined that comparable results are obtained.

(f) *Heater and defroster usage.* The vehicle interior climate control system shall be operated with the interior heating system on and the air flow directed to the mode that primarily defrosts the front window during the test. Air conditioning controls shall be set to the ''Off'' position. No supplemental auxiliary heat is permitted during the dynamometer procedure. The heater may be used at any temperature and fan settings during vehicle preconditioning. The manufacturer shall use the vehicle's controls to achieve the operation specified in this paragraph (f). The manufacturer shall use good engineering judgment and take into account engine control changes (e.g., engine-off logic, idle speed operation, spark advance changes) and engine control features that may be directly affected by the fan or temperature settings.

(1) Manually controlled systems. (i) Prior to the first acceleration of the test at T=20 seconds the climate control settings shall be set as follows (these settings may be initiated prior to starting the vehicle if allowed by the vehicle's climate control system):

(A) Temperature: Manually operated systems shall be set to maximum heat. Automatic systems optionally using the provisions of this paragraph (f)(1) shall be set to 72 degrees F or higher.

(B) Fan speed: Full off, or if a full off position is not available, to the lowest available speed.

(C) Airflow direction: Airflow directed to the front window (window defrost mode). Based on good engineering judgment, an alternative vent setting may be used if necessary to achieve the temperature and fan speed settings in this paragraph (f)(1).

(D) Air source: If independently controllable, the airflow source control shall be set to the position which draws outside air.

(ii) At the second idle of the test cycle, which occurs at the first deceleration to zero miles per hour at T=125 seconds, the fan speed shall be set to maximum, and, if not already set in this position, the airflow shall be directed fully to the front window in the window defrost mode. Temperature and air source settings shall remain as set in paragraph (f)(1) of this section. These settings shall be completed by T=130 seconds.

(iii) At the sixth idle of the test cycle, which occurs at the deceleration to zero miles per hour at T=505 seconds, the fan speed shall be set to the lowest setting that maintains air flow. This setting shall be completed by T=510 seconds. Based on good engineering judgment, the manufacturer may use alternative vent and/or higher fan speed settings for the remainder of the test. Temperature and air source settings shall remain as set in paragraph (f)(1)(i) of this section for the remainder of the test.

(2) Automatic systems. Automatic systems may use either the provisions in paragraph (f)(1) of this section or manufacturers may set the temperature at 72 degrees F and the air flow control to the front window defroster mode for the entire duration of the test.

(3) Multiple-zone systems. For vehicles with separate driver and passenger controls, or for vehicles with separate controls for the front seating region and for the passenger region behind the driver, all sets of temperature and fan controls shall be set according to paragraphs (f)(1) through (f)(3) of this section.

(4) Alternative test procedures. The Administrator may approve the use of other settings under § 86.1840–01 if, for example, a vehicle's climate control system is not compatible with the provisions of this section.

■ 13. A new section 86.237–08 is added to read as follows:

§ 86.237–08 Dynamometer test run, gaseous emissions.

(a) The complete dynamometer test consists of a cold start drive of approximately 7.5 miles (12.1 kilometers) and a hot start drive of approximately 3.6 miles (5.8 kilometers).

(b) If the preconditioned vehicle is not already on the dynamometer, it shall be pushed into position.

(c) The vehicle is allowed to stand on the dynamometer during the ten minute time period between the cold and hot start test. The cold start test is divided into two periods. The first period, representing the cold start ''transient'' phase, terminates at the end of the deceleration which is scheduled to occur at 505 seconds of the driving schedule. The second period, representing the ''stabilized'' phase, consists of the remainder of the driving schedule, including engine shutdown. The hot start test is identical to the first part or transient phase of the cold start test. Therefore, the hot start test terminates after the first period (505 seconds) is run.

(d) The dynamometer run consists of two tests, a cold start test, after a minimum 12-hour and a maximum 36-hour soak according to the provisions of § 86.132, and a hot start test following the cold start test by 10 minutes. The vehicle shall be stored prior to the emission test in such a manner that precipitation (e.g., rain or dew) does not occur on the vehicle. The complete dynamometer test consists of a cold start drive of 7.5 miles (12.1 km) and simulates a hot start drive of 7.5 miles (12.1 km). The vehicle is allowed to stand on the dynamometer during the 10 minute time period between the cold and hot start tests. The cold start test is divided into two periods. The first period, representing the cold start ''transient'' phase, terminates at the end of the deceleration which is scheduled to occur at 505 seconds of the driving schedule. The second period, representing the ''stabilized'' phase, consists of the remainder of the driving schedule including engine shutdown. The hot start test, similarly, consists of two periods. The first period, representing the hot start ''transient'' phase, terminates at the same point in driving schedule as the first period of the cold start test. The second period of the hot start test, ''stabilized'' phase, is assumed to be identical to the second period of the cold start test. Therefore, the hot start test terminates after the first period (505 seconds) is run. Measurement of NO_X and particulate matter is not required.

(e) The following steps shall be taken for each test:

(1) Place drive wheels of vehicle on dynamometer without starting engine.

(2) Open the vehicle engine compartment cover and position the cooling fan.

(3) For all vehicles, with the sample selector valves in the ''standby'' position, connect evacuated sample collection bags to the dilute exhaust and dilution air sample collection systems.

(4) For methanol-fueled vehicles, with the sample selector valves in the ''standby'' position, insert fresh sample collection impingers into the methanol sample collection system, fresh impingers or a fresh cartridge into the formaldehyde sample collection system and fresh impingers (or a single cartridge for formaldehyde) into the dilution air sample collection systems for methanol and formaldehyde (background measurements of methanol and formaldehyde may be omitted and concentrations assumed to be zero for calculations in § 86.144).

(5) Start the CVS (if not already on), the sample pumps (except the particulate sample pump, if applicable), the temperature recorder, the vehicle cooling fan, and the heated THC analysis recorder (diesel-cycle only). (The heat exchanger of the constant volume sampler, if used, petroleum-fueled diesel-cycle THC analyzer continuous sample line and filter, methanol-fueled vehicle THC, methanol and formaldehyde sample lines, if applicable, should be preheated to their respective operating temperatures before the test begins).

(6) Adjust the sample flow rates to the desired flow rate and set the gas flow measuring devices to zero.

(i) For gaseous bag samples (except THC samples), the minimum flow rate is 0.17 cfm (0.08 1/sec).

(ii) For THC samples, the minimum FID (or HFID in the case of diesel-cycle and methanol-fueled Otto-cycle vehicles) flow rate is 0.066 cfm (0.031 1/sec).

(iii) For methanol samples, the flow rates shall be set such that the system meets the design criteria of § 86.109 and § 86.110. For samples in which the concentration in the primary impinger exceeds 0.5 mg/l, it is recommended that the mass of methanol collected in the secondary impinger not exceed ten percent of the total mass collected. For samples in which the concentration in the primary impinger does not exceed 0.5 mg/l, analysis of the secondary impingers is not necessary.

(iv) For formaldehyde samples, the flow rates shall be set such that the system meets the design criteria of § 86.109 and § 86.110. For impinger samples in which the concentration of formaldehyde in the primary impinger exceeds 0.1 mg/l, it is recommended

that the mass of formaldehyde collected in the secondary impinger not exceed ten percent of the total mass collected. For samples in which the concentration in the primary impinger does not exceed 0.1 mg/l, analysis of the secondary impingers is not necessary.

(7) Attach the exhaust tube to the vehicle tailpipe(s).

(8) Start the gas flow measuring device, position the sample selector valves to direct the sample flow into the ''transient'' exhaust sample bag, the ''transient'' methanol exhaust sample, the ''transient'' formaldehyde exhaust sample, the ''transient'' dilution air sample bag, the ''transient'' methanol dilution air sample and the ''transient'' formaldehyde dilution air sample (turn on the petroleum-fueled diesel-cycle THC analyzer system integrator, mark the recorder chart and record both gas meter or flow measurement instrument readings, if applicable), turn the key on, and start cranking the engine.

(9) Fifteen seconds after the engine starts, place the transmission in gear.

(10) Twenty seconds after the engine starts, begin the initial vehicle acceleration of the driving schedule.

(11) Operate the vehicle according to the Urban Dynamometer Driving Schedule (§ 86.115).

Note: During particulate testing, if applicable, adjust the flow rate through the particulate sample probe to maintain a constant value within ±5 percent of the set flow rate. Record the average temperature and pressure at the gas meter or flow instrument inlet. If the set flow rate cannot be maintained because of high particulate loading on the filter, the test shall be terminated. The test shall be rerun using a lower flow rate, or larger diameter filter, or both.

(12) At the end of the deceleration which is scheduled to occur at 505 seconds, simultaneously switch the sample flows from the ''transient'' bags and samples to the ''stabilized'' bags and samples, switch off gas flow measuring device No. 1, switch off the No. 1 petroleum-fueled diesel hydrocarbon integrator, mark the petroleum-fueled diesel hydrocarbon recorder chart, start gas flow measuring device No. 2, and start the petroleum-fueled diesel hydrocarbon integrator No. 2. Before the acceleration which is scheduled to occur at 510 seconds, record the measured roll or shaft revolutions and reset the counter or switch to a second counter. As soon as possible transfer the ''transient'' exhaust and dilution air samples to the analytical system and process the samples according to § 86.140 obtaining a stabilized reading of the bag exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample collection phase of the test.

(13) Turn the engine off 2 seconds after the end of the last deceleration (at 1,369 seconds).

(14) Five seconds after the engine stops running, simultaneously turn off gas flow measuring device No. 2 and if applicable, turn off the hydrocarbon integrator No. 2, mark the hydrocarbon recorder chart and position the sample selector valves to the ''standby'' position (and open the valves isolating particulate filter No. 1, if applicable). Record the measured roll or shaft revolutions (both gas meter or flow measurement instrumentation readings), and reset the counter. As soon as possible, transfer the ''stabilized'' exhaust and dilution air samples to the analytical system and process the samples according to § 86.140, obtaining a stabilized reading of the exhaust bag sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample period. (If it is not possible to perform analysis on the methanol and formaldehyde samples within 24 hours, the samples should be stored in a dark cold (4–10 °C) environment until analysis. The samples should be analyzed within fourteen days.)

(15) Immediately after the end of the sample period, turn off the cooling fan and close the engine compartment cover.

(16) Turn off the CVS or disconnect the exhaust tube from the tailpipe(s) of the vehicle.

(17) Repeat the steps in paragraphs (b)(2) through (b)(2) of this section for the hot start test, except only two evacuated sample bags, two methanod sample impringers, and two formaldehyde sample impingers are required. The step in paragraph (b)(9) of this section shall begin between 9 and 11 minutes after the end of the sample period for the cold start test.

(18) At the end of the deceleration which is scheduled to occur at 505 seconds, simultaneously turn off gas flow measuring device No. 1 (and the petroleum-fueled diesel hydrocarbon integrator No. 1, mark the petroleum-fueled diesel hydrocarbon recorder chart) and position the sample selector valve to the ''standby'' position. (Engine shutdown is not part of the hot start test sample period.) Record the measured roll or shaft revolutions (and the No. 1 gas meter reading or flow measurement instrument). (Carefully remove the third pair of particulate sample filters from its holder and place in a clean petri dish and cover, if applicable.)

(19) As soon as possible, transfer the hot start ''transient'' exhaust and dilution air samples to the analytical system and process the samples according to § 86.140, obtaining a stabilized reading of the exhaust bag sample on all analyzers within 20 minutes of the end of the sample collection phase of the test. Obtain methanol and formaldehyde sample analyses, if applicable, within 24 hours of the end of the sample period. (If it is not possible to perform analysis on the methanol and formaldehyde samples, within 24 hours the samples should be stored in a dark cold (4–10 °C) environment until analysis. The samples should be analyzed within fourteen days.)

(20) Disconnect the exhaust tube from the vehicle tailpipe(s) and drive the vehicle from dynamometer.

(21) The CVS or CFV may be turned off, if desired.

(22) Vehicles to be tested for evaporative emissions will proceed according to § 86.138. For all others this completes the test sequence.

■ 14. Section 86.244–94 is revised to read as follows:

§ 86.244–94 Calculations; exhaust emissions.

The provisions of § 86.144–94 apply to this subpart, except that NO_X measurements are optional. Should NO_X measurements be calculated, note that the humidity correction factor is not valid at colder temperatures. Light-duty vehicles and light-duty trucks must calculate and report the weighted mass of each relevant pollutant, i.e., THC, CO, THCE, NMHC, NMHCE, CH4, NO_X, and CO_2 in grams per vehicle mile.

PART 600—FUEL ECONOMY OF VEHICLES

■ 15. The authority citation for part 600 is revised to read as follows:

Authority: 49 U.S.C. 32901—23919q, Pub. L. 109–58.

Subpart A—[Amended]

■ 16. A new § 600.001–08 is added to read as follows:

§ 600.001–08 General applicability.

(a) The provisions of this subpart are applicable to 2008 and later model year automobiles, except medium duty passenger vehicles, manufactured on or after January 26, 2007, and to 2011 and later model year medium-duty

passenger vehicles. All 2008 automobiles manufactured prior to January 26, 2007 may optionally comply with the provisions of this subpart.

(b)(1) Manufacturers that produce only electric vehicles are exempt from the requirements of this subpart, except with regard to the requirements in those sections pertaining specifically to electric vehicles.

(2) Manufacturers with worldwide production (excluding electric vehicle production) of less than 10,000 gasoline-fueled and/or diesel powered passenger automobiles and light trucks may optionally comply with the electric vehicle requirements in this subpart.

■ 17. A new § 600.002–08 is added to read as follows:

§ 600.002–08 Definitions.

3-bag FTP means the Federal Test Procedure specified in part 86 of this chapter, with three sampling portions consisting of the cold-start transient (''Bag 1''), stabilized (''Bag 2''), and hot-start transient phases (''Bag 3'').

4-bag FTP means the 3-bag FTP, with the addition of a sampling portion for the hot-start stabilized phase (''Bag 4'').

5-cycle means the FTP, HFET, US06, SC03 and cold temperature FTP tests as described in Subparts B and C of this part.

Administrator means the Administrator of the Environmental Protection Agency or his authorized representative.

Alcohol means a mixture containing 85 percent or more by volume methanol, ethanol, or other alcohols, in any combination.

Alcohol-fueled automobile means an automobile designed to operate exclusively on alcohol.

Alcohol dual fuel automobile means an automobile:

(1) Which is designed to operate on alcohol and on gasoline or diesel fuel; and

(2) Which provides equal or greater energy efficiency as calculated in accordance with § 600.510(g)(1) while operating on alcohol as it does while operating on gasoline or diesel fuel; and

(3) Which, in the case of passenger automobiles, meets or exceeds the minimum driving range established by the Department of Transportation in 49 CFR part 538.

Automobile has the meaning given by the Department of Transportation at 49 CFR 523.3.

Auxiliary emission control device (AECD) means an element of design as defined in part 86 of this chapter.

Average fuel economy means the unique fuel economy value as computed under § 600.510 for a specific class of automobiles produced by a manufacturer that is subject to average fuel economy standards.

Axle ratio means the number of times the input shaft to the differential (or equivalent) turns for each turn of the drive wheels.

Base level means a unique combination of basic engine, inertia weight class and transmission class.

Base vehicle means the lowest priced version of each body style that makes up a car line.

Basic engine means a unique combination of manufacturer, engine displacement, number of cylinders, fuel system (e.g., type of fuel injection), catalyst usage, and other engine and emission control system characteristics specified by the Administrator. For electric vehicles, basic engine means a unique combination of manufacturer and electric traction motor, motor controller, battery configuration, electrical charging system, energy storage device, and other components as specified by the Administrator.

Battery configuration means the electrochemical type, voltage, capacity (in Watt-hours at the c/3 rate), and physical characteristics of the battery used as the tractive energy device.

Body style means a level of commonality in vehicle construction as defined by number of doors and roof treatment (e.g., sedan, convertible, fastback, hatchback) and number of seats (i.e., front, second, or third seat) requiring seat belts pursuant to National Highway Traffic Safety Administration safety regulations in 49 CFR part 571. Station wagons and light trucks are identified as car lines.

Calibration means the set of specifications, including tolerances, unique to a particular design, version of application of a component, or component assembly capable of functionally describing its operation over its working range.

Car line means a name denoting a group of vehicles within a make or car division which has a degree of commonality in construction (e.g., body, chassis). Car line does not consider any level of decor or opulence and is not generally distinguished by characteristics as roof line, number of doors, seats, or windows, except for station wagons or light-duty trucks. Station wagons and light-duty trucks are considered to be different car lines than passenger cars.

Certification vehicle means a vehicle which is selected under § 86.1828–01 of this chapter and used to determine compliance under § 86.1848–01 of this chapter for issuance of an original certificate of conformity.

City fuel economy means the city fuel economy determined by operating a vehicle (or vehicles) over the driving schedule in the Federal emission test procedure, or determined according to the vehicle-specific 5-cycle or derived 5-cycle procedures.

Cold temperature FTP means the test performed under the provisions of Subpart C of part 86 of this chapter.

Combined fuel economy means:

(1) The fuel economy value determined for a vehicle (or vehicles) by harmonically averaging the city and highway fuel economy values, weighted 0.55 and 0.45 respectively.

(2) For electric vehicles, the term means the equivalent petroleum-based fuel economy value as determined by the calculation procedure promulgated by the Secretary of Energy.

Dealer means a person who resides or is located in the United States, any territory of the United States, or the District of Columbia and who is engaged in the sale or distribution of new automobiles to the ultimate purchaser.

Derived 5-cycle fuel economy means the 5-cycle fuel economy derived from the FTP-based city and HFET-based highway fuel economy by means of the equation provided in § 600.210–08.

Drive system is determined by the number and location of drive axles (e.g., front wheel drive, rear wheel drive, four wheel drive) and any other feature of the drive system if the Administrator determines that such other features may result in a fuel economy difference.

Electrical charging system means a device to convert 60 Hz alternating electric current, as commonly available in residential electric service in the United States, to a proper form for recharging the energy storage device.

Electric traction motor means an electrically powered motor which provides tractive energy to the wheels of a vehicle.

Energy storage device means a rechargeable means of storing tractive energy on board a vehicle such as storage batteries or a flywheel.

Engine code means a unique combination, within an engine-system combination (as defined in part 86 of this chapter), of displacement, fuel injection (or carburetion or other fuel delivery system), calibration, distributor calibration, choke calibration, auxiliary emission control devices, and other engine and emission control system components specified by the Administrator. For electric vehicles, engine code means a unique combination of manufacturer, electric traction motor, motor configuration, motor controller, and energy storage device.

Federal emission test procedure (FTP) refers to the dynamometer driving schedule, dynamometer procedure, and sampling and analytical procedures described in part 86 of this chapter for the respective model year, which are used to derive city fuel economy data.

FTP-based city fuel economy means the fuel economy determined in § 600.113–08 of this part, on the basis of FTP testing.

Fuel means:

(1) Gasoline and diesel fuel for gasoline- or diesel-powered automobiles; or

(2) Electrical energy for electrically powered automobiles; or

(3) Alcohol for alcohol-powered automobiles; or

(4) Natural gas for natural gas-powered automobiles.

Fuel economy means:

(1) The average number of miles traveled by an automobile or group of automobiles per volume of fuel consumed as calculated in this part; or

(2) The equivalent petroleum-based fuel economy for an electrically powered automobile as determined by the Secretary of Energy.

Fuel economy data vehicle means a vehicle used for the purpose of determining fuel economy which is not a certification vehicle.

Gross vehicle weight rating means the manufacturer's gross weight rating for the individual vehicle.

Hatchback means a passenger automobile where the conventional luggage compartment, i.e., trunk, is replaced by a cargo area which is open to the passenger compartment and accessed vertically by a rear door which encompasses the rear window.

Highway fuel economy means the highway fuel economy determined either by operating a vehicle (or vehicles) over the driving schedule in the Federal highway fuel economy test procedure, or determined according to either the vehicle-specific 5-cycle equation or the derived 5-cycle equation for highway fuel economy.

Highway fuel economy test procedure (HFET) refers to the dynamometer driving schedule, dynamometer procedure, and sampling and analytical procedures described in subpart B of this part and which are used to derive highway fuel economy data.

HFET-based fuel economy means the highway fuel economy determined in § 600.113–08 of this part, on the basis of HFET testing.

Inertia weight class means the class, which is a group of test weights, into which a vehicle is grouped based on its loaded vehicle weight in accordance with the provisions of part 86 of this chapter.

Label means a sticker that contains fuel economy information and is affixed to new automobiles in accordance with subpart D of this part.

Light truck means an automobile that is not a passenger automobile, as defined by the Secretary of Transportation at 49 CFR 523.5. This term is interchangeable with ''non-passenger automobile''.

Medium-duty passenger vehicle means a vehicle which would satisfy the criteria for light trucks as defined by the Secretary of Transportation at 49 CFR 523.5 but for its gross vehicle weight rating or its curb weight, which is rated at more than 8,500 lbs GVWR or has a vehicle curb weight of more than 6,000 pounds or has a basic vehicle frontal area in excess of 45 square feet, and which is designed primarily to transport passengers, but does not include a vehicle that:

(1) Is an ''incomplete truck'' as defined in this subpart; or

(2) Has a seating capacity of more than 12 persons; or

(3) Is designed for more than 9 persons in seating rearward of the driver's seat; or

(4) Is equipped with an open cargo area (for example, a pick-up truck box or bed) of 72.0 inches in interior length or more. A covered box not readily accessible from the passenger compartment will be considered an open cargo area for purposes of this definition.

Minivan means a light truck which is designed primarily to carry no more than eight passengers having an integral enclosure fully enclosing the driver, passenger, and load-carrying compartments, with a total interior volume at or below 180 cubic feet, and rear seats readily removed or folded to floor level to facilitate cargo carrying. A minivan typically includes one or more sliding doors and a rear liftgate.

Model year means the manufacturer's annual production period (as determined by the Administrator) which includes January 1 of such calendar year. If a manufacturer has no annual production period, the term ''model year'' means the calendar year.

Model type means a unique combination of car line, basic engine, and transmission class.

Motor controller means an electronic or electro-mechanical device to convert energy stored in an energy storage device into a form suitable to power the traction motor.

Natural gas-fueled automobile means an automobile designed to operate exclusively on natural gas.

Natural gas dual fuel automobile means an automobile:

(1) Which is designed to operate on natural gas and on gasoline or diesel fuel;

(2) Which provides equal or greater energy efficiency as calculated in § 600.510(g)(1) while operating on natural gas as it does while operating on gasoline or diesel fuel; and

(3) Which, in the case of passenger automobiles, meets or exceeds the minimum driving range established by the Department of Transportation in 49 CFR part 538.

Nonpassenger automobile means a light truck.

Passenger automobile means any automobile which the Secretary of Transportation determines is manufactured primarily for use in the transportation of no more than 10 individuals.

Pickup truck means a nonpassenger automobile which has a passenger compartment and an open cargo bed.

Production volume means, for a domestic manufacturer, the number of vehicle units domestically produced in a particular model year but not exported, and for a foreign manufacturer, means the number of vehicle units of a particular model imported into the United States.

Rounded means a number shortened to the specific number of decimal places in accordance with the rounding method specified in ASTM E 29–67 (Reapproved 1973) ''Standard Recommended Practice for Indicating which Places of Figures are to be Considered Significant in Specified Limiting Values.'' This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

SC03 means the test procedure specified in § 86.160–00 of this chapter.

Secretary of Transportation means the Secretary of Transportation or his authorized representative.

Secretary of Energy means the Secretary of Energy or his authorized representative.

Sport utility vehicle (SUV) means a light truck with an extended roof line to increase cargo or passenger capacity, cargo compartment open to the passenger compartment, and one or more rear seats readily removed or folded to facilitate cargo carrying.

Station wagon means a passenger automobile with an extended roof line to increase cargo or passenger capacity, cargo compartment open to the passenger compartment, a tailgate, and one or more rear seats readily removed or folded to facilitate cargo carrying.

Subconfiguration means a unique combination within a vehicle configuration of equivalent test weight, road-load horsepower, and any other operational characteristics or parameters which the Administrator determines may significantly affect fuel economy within a vehicle configuration.

Transmission class means a group of transmissions having the following common features: Basic transmission type (manual, automatic, or semi-automatic); number of forward gears used in fuel economy testing (e.g., manual four-speed, three-speed automatic, two-speed semi-automatic); drive system (e.g., front wheel drive, rear wheel drive; four wheel drive), type of overdrive, if applicable (e.g., final gear ratio less than 1.00, separate overdrive unit); torque converter type, if applicable (e.g., non-lockup, lockup, variable ratio); and other transmission characteristics that may be determined to be significant by the Administrator.

Transmission configuration means the Administrator may further subdivide within a transmission class if the Administrator determines that sufficient fuel economy differences exist. Features such as gear ratios, torque converter multiplication ratio, stall speed, shift calibration, or shift speed may be used to further distinguish characteristics within a transmission class.

Test weight means the weight within an inertia weight class which is used in the dynamometer testing of a vehicle, and which is based on its loaded vehicle weight in accordance with the provisions of part 86 of this chapter.

Ultimate consumer means the first person who purchases an automobile for purposes other than resale or leases an automobile.

US06 means the test procedure as described in § 86.159–08 of this chapter.

US06-City means the combined periods of the US06 test that occur before and after the US06-Highway period.

US06-Highway means the period of the US06 test that begins at the end of the deceleration which is scheduled to occur at 130 seconds of the driving schedule and terminates at the end of the deceleration which is scheduled to occur at 495 seconds of the driving schedule.

Van means any light truck having an integral enclosure fully enclosing the driver compartment and load carrying device, and having no body sections protruding more than 30 inches ahead of the leading edge of the windshield.

Vehicle configuration means a unique combination of basic engine, engine code, inertia weight class, transmission configuration, and axle ratio within a base level.

Vehicle-specific 5-cycle fuel economy means the fuel economy calculated according to the procedures in § 600.114–08.

■ 18. A new § 600.006–08 is added to read as follows:

§ 600.006–08 Data and information requirements for fuel economy vehicles.

(a) For certification vehicles with less than 10,000 miles, the requirements of this section are considered to have been met except as noted in paragraph (c) of this section.

(b)(1) The manufacturer shall submit the following information for each fuel economy data vehicle:

(i) A description of the vehicle, exhaust emission test results, applicable deterioration factors, adjusted exhaust emission levels, and test fuel property values as specified in § 600.113–08.

(ii) A statement of the origin of the vehicle including total mileage accumulation, and modification (if any) form the vehicle configuration in which the mileage was accumulated. (For modifications requiring advance approval by the Administrator, the name of the Administrator's representative approving the modification and date of approval are required.) If the vehicle was previously used for testing for compliance with part 86 of this chapter or previously accepted by the Administrator as a fuel economy data vehicle in a different configuration, the requirements of this paragraph may be satisfied by reference to the vehicle number and previous configuration.

(iii) A statement that the fuel economy data vehicle for which data are submitted:

(A) Has been tested in accordance with applicable test procedures;

(B) Is, to the best of the manufacturer's knowledge, representative of the vehicle configuration listed; and

(C) Is in compliance with applicable exhaust emission standards.

(2) The manufacturer shall retain the following information for each fuel economy data vehicle, and make it available to the Administrator upon request:

(i) A description of all maintenance to engine, emission control system, or fuel system, or fuel system components performed within 2,000 miles prior to fuel economy testing.

(ii) In the case of electric vehicles, a description of all maintenance to electric motor, motor controller, battery configuration, or other components performed within 2,000 miles prior to fuel economy testing.

(iii) A copy of calibrations for engine, fuel system, and emission control devices, showing the calibration of the actual components on the test vehicle as well as the design tolerances.

(iv) In the case of electric vehicles, a copy of calibrations for the electric motor, motor controller, battery configuration, or other components on the test vehicle as well as the design tolerances.

(v) If calibrations for components specified in paragraph (b)(2) (iii) or (iv) of this section were submitted previously as part of the description of another vehicle or configuration, the original submittal may be referenced.

(c) The manufacturer shall submit the following fuel economy data:

(1) For vehicles tested to meet the requirements of part 86 of this chapter (other than those chosen in accordance with §§ 86.1829–01(a) or 86.1845 of this chapter, the FTP, highway, US06, SC03 and cold temperature FTP fuel economy results, as applicable, from all tests on that vehicle, and the test results adjusted in accordance with paragraph (g) of this section.

(2) For each fuel economy data vehicle, all individual test results (excluding results of invalid and zero mile tests) and these test results adjusted in accordance with paragraph (g) of this section.

(3) For diesel vehicles tested to meet the requirements of part 86 of this chapter, data from a cold temperature FTP, performed in accordance with § 600.111–08(e), using the fuel specified in § 600.107–08(c).

(4) For all vehicles tested in paragraph (c)(1) through (3) of this section, the individual fuel economy results measured on a per-phase basis, that is, the individual phase results for all sample phases of the FTP, cold temperature FTP and US06 tests.

(d) The manufacturer shall submit an indication of the intended purpose of the data (e.g., data required by the general labeling program or voluntarily submitted for specific labeling).

(e) In lieu of submitting actual data from a test vehicle, a manufacturer may

provide fuel economy values derived from an analytical expression, e.g., regression analysis. In order for fuel economy values derived from analytical methods to be accepted, the expression (form and coefficients) must have been approved by the Administrator.

(f) If, in conducting tests required or authorized by this part, the manufacturer utilizes procedures, equipment, or facilities not described in the Application for Certification required in § 86.1844–01 of this chapter, the manufacturer shall submit to the Administrator a description of such procedures, equipment, and facilities.

(g)(1) The manufacturer shall adjust all test data used for fuel economy label calculations in subpart D and average fuel economy calculations in subpart F for the classes of automobiles within the categories identified in paragraphs of § 600.510(a)(1) through (4). The test data shall be adjusted in accordance with paragraph (g)(3) or (4) of this section as applicable.

(2) [Reserved]

(3) The manufacturer shall adjust all test data generated by vehicles with engine-drive system combinations with more than 6,200 miles by using the following equation:

$$FE_{4,000mi} = FE_T[0.979 + 5.25\times10^{-6}(mi)]^{-1}$$

Where:

$FE_{4,000mi}$ = Fuel economy data adjusted to 4,000-mile test point rounded to the nearest 0.1 mpg.

FE_T = Tested fuel economy value rounded to the nearest 0.1 mpg.

mi = System miles accumulated at the start of the test rounded to the nearest whole mile.

(4) For vehicles with 6,200 miles or less accumulated, the manufacturer is not required to adjust the data.

■ 19. A new § 600.007–08 is added to read as follows:

§ 600.007–08 Vehicle acceptability.

(a) All certification vehicles and other vehicles tested to meet the requirements of part 86 of this chapter (other than those chosen per § 86.1829–01(a) of this chapter), are considered to have met the requirements of this section.

(b) Any vehicle not meeting the provisions of paragraph (a) of this section must be judged acceptable by the Administrator under this section in order for the test results to be reviewed for use in subpart C or F of this part. The Administrator will judge the acceptability of a fuel economy data vehicle on the basis of the information supplied by the manufacturer under § 600.006(b). The criteria to be met are:

(1) A fuel economy data vehicle may have accumulated not more than 10,000 miles. A vehicle will be considered to have met this requirement if the engine and drivetrain have accumulated 10,000 or fewer miles. The components installed for a fuel economy test are not required to be the ones with which the mileage was accumulated, e.g., axles, transmission types, and tire sizes may be changed. The Administrator will determine if vehicle/engine component changes are acceptable.

(2) A vehicle may be tested in different vehicle configurations by change of vehicle components, as specified in paragraph (b)(1) of this section, or by testing in different inertia weight classes. Also, a single vehicle may be tested under different test conditions, i.e., test weight and/or road load horsepower, to generate fuel economy data representing various situations within a vehicle configuration. For purposes of this part, data generated by a single vehicle tested in various test conditions will be treated as if the data were generated by the testing of multiple vehicles.

(3) The mileage on a fuel economy data vehicle must be, to the extent possible, accumulated according to § 86.1831 of this chapter.

(4) Each fuel economy data vehicle must meet the same exhaust emission standards as certification vehicles of the respective engine-system combination during the test in which the city fuel economy test results are generated. The deterioration factors established for the respective engine-system combination per § 86.1841–01 of this chapter as applicable will be used.

(5) The calibration information submitted under § 600.006(b) must be representative of the vehicle configuration for which the fuel economy data were submitted.

(6) Any vehicle tested for fuel economy purposes must be representative of a vehicle which the manufacturer intends to produce under the provisions of a certificate of conformity.

(7) For vehicles imported under § 85.1509 or § 85.1511(b)(2), (b)(4), (c)(2), (c)(4) of this chapter, or (e)(2) (when applicable) only the following requirements must be met:

(i) For vehicles imported under § 85.1509 of this chapter, a highway fuel economy value must be generated contemporaneously with the emission tests used for purposes of demonstrating compliance with § 85.1509 of this chapter. No modifications or adjustments should be made to the vehicles between the highway fuel economy, FTP, US06, SC03 and Cold temperature FTP tests.

(ii) For vehicles imported under § 85.1509 or § 85.1511(b)(2), (b)(4), (c)(2), or (c)(4) of this chapter (when applicable) with over 10,000 miles, the equation in § 600.006–08(g)(3) shall be used as though only 10,000 miles had been accumulated.

(iii) Any required fuel economy testing must take place after any safety modifications are completed for each vehicle as required by regulations of the Department of Transportation.

(iv) Every vehicle imported under § 85.1509 or § 85.1511(b)(2), (b)(4), (c)(2), or (c)(4) of this chapter (when applicable) must be considered a separate type for the purposes of calculating a fuel economy label for a manufacturer's average fuel economy.

(c) If, based on review of the information submitted under § 600.006(b), the Administrator determines that a fuel economy data vehicle meets the requirements of this section, the fuel economy data vehicle will be judged to be acceptable and fuel economy data from that fuel economy data vehicle will be reviewed pursuant to § 600.008.

(d) If, based on the review of the information submitted under § 600.006(b), the Administrator determines that a fuel economy data vehicle does not meet the requirements of this section, the Administrator will reject that fuel economy data vehicle and inform the manufacturer of the rejection in writing.

(e) If, based on a review of the emission data for a fuel economy data vehicle, submitted under § 600.006(b), or emission data generated by a vehicle tested under § 600.008(e), the Administrator finds an indication of non-compliance with section 202 of the Clean Air Act, 42 U.S.C. 1857 et seq. of the regulation thereunder, he may take such investigative actions as are appropriate to determine to what extent emission non-compliance actually exists.

(1) The Administrator may, under the provisions of § 86.1830–01 of this chapter, request the manufacturer to submit production vehicles of the configuration(s) specified by the Administrator for testing to determine to what extent emission noncompliance of a production vehicle configuration or of a group of production vehicle configurations may actually exist.

(2) If the Administrator determines, as a result of his investigation, that substantial emission non-compliance is exhibited by a production vehicle configuration or group of production vehicle configurations, he may proceed with respect to the vehicle configuration(s) as provided under

§ 600.206(b)(2) or § 600.207(c)(1), as applicable of the Clean Air Act, 42 U.S.C. 1857 *et seq.*

(f) All vehicles used to generate fuel economy data, and for which emission standards apply, must be covered by a certificate of conformity under part 86 of this chapter before:

(1) The data may be used in the calculation of any approved general or specific label value, or

(2) The data will be used in any calculations under subpart F, except that vehicles imported under §§ 85.1509 and 85.1511 of this chapter need not be covered by a certificate of conformity.

■ 20. A new § 600.008–08 is added to read as follows:

§ 600.008–08 Review of fuel economy data, testing by the Administrator.

(a) *Testing by the Administrator.* (1) The Administrator may require that any one or more of the test vehicles be submitted to the Agency, at such place or places as the Agency may designate, for the purposes of conducting fuel economy tests. The Administrator may specify that such testing be conducted at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. The tests to be performed may comprise the FTP, highway fuel economy test, US06, SC03, or Cold temperature FTP or any combination of those tests. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(2) Retesting and official data determination. For any vehicles selected for confirmatory testing under the provisions of paragraph (a)(1) of this section, the Administrator will follow this procedure:

(i) The manufacturer's data (or harmonically averaged data if more than one test was conducted) will be compared with the results of the Administrator's test.

(ii) If, in the Administrator's judgment, the comparison in paragraph (a)(2)(i) of this section indicates a disparity in the data, the Administrator will repeat the test or tests as applicable.

(A) The manufacturer's average test results and the results of the Administrator's first test will be compared with the results of the Administrator's second test as in paragraph (a)(2)(i) of this section.

(B) If, in the Administrator's judgment, both comparisons in paragraph (a)(2)(i)(A) of this section, indicate a disparity in the data, the Administrator will repeat the applicable test or tests until:

(*1*) In the Administrator's judgment no disparity in the data is indicated by comparison of two tests by the Administrator or by comparison of the manufacturer's average test results and a test by the Administrator; or

(*2*) Four tests of a single test type are conducted by the Administrator in which a disparity in the data is indicated when compared as in paragraph (a)(2)(ii) of this section.

(iii) If there is, in the Administrator's judgment, no disparity indicated by comparison of manufacturer's average test results with a test by the Administrator, the test values generated by the Administrator will be used to represent the vehicle.

(iv) If there is, in the Administrator's judgment, no disparity indicated by comparison of two tests by the Administrator, the harmonic averages of the fuel economy results from those tests will be used to represent the vehicle.

(v) If the situation in paragraph (a)(2)(ii)(B)(*2*) of this section occurs, the Administrator will notify the manufacturer, in writing, that the Administrator rejects that fuel economy data vehicle.

(b) *Manufacturer-conducted confirmatory testing.* (1) If the Administrator determines not to conduct a confirmatory test under the provisions of paragraph (a) of this section, manufacturers will conduct a confirmatory test at their facility after submitting the original test data to the Administrator whenever any of the following conditions exist:

(i) The vehicle configuration has previously failed an emission standard;

(ii) The test exhibits high emission levels determined by exceeding a percentage of the standards specified by the Administrator for that model year;

(iii) The fuel economy value of the FTP or HFET test is higher than expected based on procedures approved by the Administrator;

(iv) The fuel economy for the FTP or HFET test is close to a Gas Guzzler Tax threshold value based on tolerances established by the Administrator; or

(v) The fuel economy value for the FTP or highway is a potential fuel economy leader for a class of vehicles based on cut points provided by the Administrator.

(2) If the Administrator selects the vehicle for confirmatory testing based on the manufacturer's original test results, the testing shall be conducted as ordered by the Administrator. In this case, the manufacturer-conducted confirmatory testing specified under paragraph (b)(1) of this section would not be required.

(3) The manufacturer shall conduct a retest of the FTP or highway test if the difference between the fuel economy of the confirmatory test and the original manufacturer's test equals or exceeds three percent (or such lower percentage to be applied consistently to all manufacturer-conducted confirmatory testing as requested by the manufacturer and approved by the Administrator).

(i) The manufacturer may, in lieu of conducting a retest, accept the lower of the original and confirmatory test fuel economy results for use in subpart C or F of this part.

(ii) The manufacturer shall conduct a second retest of the FTP or highway test if the fuel economy difference between the second confirmatory test and the original manufacturer test equals or exceeds three percent (or such lower percentage as requested by the manufacturer and approved by the Administrator) and the fuel economy difference between the second confirmatory test and the first confirmatory test equals or exceeds three percent (or such lower percentage as requested by the manufacturer and approved by the Administrator). The manufacturer may, in lieu of conducting a second retest, accept the lowest of the original test, the first confirmatory test, and the second confirmatory test fuel economy results for use in subpart C or F of this part.

(4) The Administrator may request the manufacturer to conduct a retest of the US06, SC03 or Cold Temperature FTP on the basis of fuel economy that is higher than expected as specified in criteria provided by the Administrator. Such retests shall not be required before the 2011 model year.

(c) *Review of fuel economy data.* (1) Fuel economy data must be judged reasonable and representative by the Administrator in order for the test results to be used for the purposes of subpart C or F of this part. In making this determination, the Administrator will, when possible, compare the results of a test vehicle to those of other similar test vehicles.

(2) If testing was conducted by the Administrator under the provisions of paragraph (a) of this section, the data from this testing, together with all other fuel economy data submitted for that vehicle under § 600.006(c) or (e) will be evaluated by the Administrator for reasonableness and representativeness per paragraph (c)(1) of this section.

(i) The fuel economy data which are determined to best meet the criteria of paragraph (c)(1) of this section will be

accepted for use in subpart C or F of this part.

(ii) City, HFET, US06, SC03 and Cold temperature FTP test data will be considered separately.

(iii) If more than one test was conducted, the Administrator may select an individual test result or the harmonic average of selected test results to satisfy the requirements of paragraph (c)(2)(i) of this section.

(3) If confirmatory testing was conducted by the manufacturer under the provisions of paragraph (b) of this section, the data from this testing will be evaluated by the Administrator for reasonableness and representativeness per paragraph (c)(1) of this section.

(i) The fuel economy data which are determined to best meet the criteria of paragraph (c)(1) of this section will be accepted for use in subpart C or F of this part.

(ii) City, HFET, US06, SC03 and Cold temperature FTP test data will be considered separately.

(iii) If more than one test was conducted, the Administrator may select an individual test result or the harmonic average of selected test results to satisfy the requirements of paragraph (c)(2)(i) of this section.

(4) If no confirmatory testing was conducted by either the Administrator or the manufacturer under the provisions of paragraph (a) and (b) of this section, respectively, then the data submitted under the provisions of § 600.006(c) or (e) shall be accepted for use in subpart C or F of this part.

(i) City, HFET, US06, SC03 and Cold temperature FTP test data will be considered separately.

(ii) If more than one test was conducted, the harmonic average of the test results shall be accepted for use in subpart C or F of this part.

(d) If, based on a review of the fuel economy data generated by testing under paragraph (a) of this section, the Administrator determines that an unacceptable level of correlation exists between fuel economy data generated by a manufacturer and fuel economy data generated by the Administrator, he/she may reject all fuel economy data submitted by the manufacturer until the cause of the discrepancy is determined and the validity of the data is established by the manufacturer.

(e)(1) If, based on the results of an inspection conducted under § 600.005(b) or any other information, the Administrator has reason to believe that the manufacturer has not followed proper testing procedures or that the testing equipment is faulty or improperly calibrated, or if records do not exist that will enable him to make a finding of proper testing, the Administrator may notify the manufacturer in writing of his finding and require the manufacturer to:

(i) Submit the test vehicle(s) upon which the data are based or additional test vehicle(s) at a place he may designate for the purpose of fuel economy testing.

(ii) Conduct such additional fuel economy testing as may be required to demonstrate that prior fuel economy test data are reasonable and representative.

(2) Previous acceptance by the Administrator of any fuel economy test data submitted by the manufacturer shall not limit the Administrator's right to require additional testing under paragraph (e)(1) of this section.

(3) If, based on tests required under paragraph (e)(1) of this section, the Administrator determines that any fuel economy data submitted by the manufacturer and used to calculate the manufacturer's fuel economy average was unrepresentative, the Administrator may recalculate the manufacturer's fuel economy average based on fuel economy data that he/she deems representative.

(4) A manufacturer may request a hearing as provided in § 600.009 if the Administrator decides to recalculate the manufacturer's average pursuant to determinations made relative to this section.

■ 21. A new § 600.010–08 is added to read as follows:

§ 600.010–08 Vehicle test requirements and minimum data requirements.

(a) Unless otherwise exempted from specific emission compliance requirements, for each certification vehicle defined in this part, and for each vehicle tested according to the emission test procedures in part 86 of this chapter for addition of a model after certification or approval of a running change (§§ 86.079–32, 86.079–33 and 86.082–34 or 86.1842–01 of this chapter, as applicable):

(1) The manufacturer shall generate FTP fuel economy data by testing according to the applicable procedures.

(2) The manufacturer shall generate highway fuel economy data by:

(i) Testing according to applicable procedures, or

(ii) Using an analytical technique, as described in § 600.006(e).

(3) The manufacturer shall generate US06 fuel economy data by testing according to the applicable procedures. Alternate fueled vehicles or dual fueled vehicles operating on alternate fuel may optionally generate this data using the alternate fuel.

(4) The manufacturer shall generate SC03 fuel economy data by testing according to the applicable procedures. Alternate fueled vehicles or dual fueled vehicles operating on alternate fuel may optionally generate this data using the alternate fuel.

(5) The manufacturer shall generate cold temperature FTP fuel economy data by testing according to the applicable procedures. Alternate fueled vehicles or dual fueled vehicles operating on alternate fuel may optionally generate this data using the alternate fuel.

(6) The data generated in paragraphs (a)(1) through (5) of this section, shall be submitted to the Administrator in combination with other data for the vehicle required to be submitted in part 86 of this chapter.

(b) For each fuel economy data vehicle:

(1) The manufacturer shall generate FTP and HFET fuel economy data by:

(i) Testing according to applicable procedures, or

(ii) Use of an analytical technique as described in § 600.006(e), in addition to testing (e.g., city fuel economy data by testing, highway fuel economy data by analytical technique).

(2) The data generated shall be submitted to the Administrator according to the procedures in § 600.006.

(c) Minimum data requirements for labeling. (1) In order to establish fuel economy label values under § 600.306–08, the manufacturer shall use only test data accepted in accordance with § 600.008–08 meeting the minimum coverage of:

(i) Data required for emission certification under §§ 86.001–24, 86.079–32, 86.079–33, 86.082–34, 86.1828–01 and 86.1842–01 of this chapter, as applicable,

(ii) (A) FTP and HFET data from the highest projected model year sales subconfiguration within the highest projected model year sales configuration for each base level, and

(B) If required under § 600.115–08, for 2011 and later model year vehicles, US06, SC03 and cold temperature FTP data from the highest projected model year sales subconfiguration within the highest projected model year sales configuration for each base level. Manufacturers may optionally generate this data for any 2008 through 2010 model years, and, 2011 and later model year vehicles, if not otherwise required.

(iii) For additional model types established under § 600.208(a)(2) or § 600.209(a)(2), FTP and HFET data, and if required under § 600.115–08, US06, SC03 and Cold temperature FTP data

from each subconfiguration included within the model type.

(2) For the purpose of recalculating fuel economy label values as required under § 600.314(b), the manufacturer shall submit data required under § 600.507.

(d) Minimum data requirements for the manufacturer's average fuel economy. For the purpose of calculating the manufacturer's average fuel economy under § 600.510, the manufacturer shall submit data representing at least 90 percent of the manufacturer's actual model year production, by configuration, for each category identified for calculation under § 600.510(a).

■ 22. The table of references in § 600.011–93(b)(1) is revised to read as follows:

§ 600.011–93 Reference materials.

* * * * *

(b) * * *

Document number and name	40 CFR part 600 reference
ASTM E 29–67 (Reapproved 1973) Standard Recommended Practice for Indicating Which Places of Figures Are To Be Considered Significant in Specified Limiting Values.	600.002–93, 600.002–08.
ASTM D 1298–85 (Reapproved 1990) Standard Practice for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method.	600.113–93, 600.510–93, 600.113–08, 600.510– 08.
ASTM D 3343–90 Standard Test Method for Estimation of Hydrogen Content of Aviation Fuels	600.113–93, 600.113–08.
ASTM D 3338–92 Standard Test Method for Estimation of Net Heat of Combustion of Aviation Fuels.	600.113–93, 600.113–08.
ASTM D 240–92 Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter.	600.113–93, 600.510–93, 600.113–08, 600.510–08.
ASTM D975–04c "Standard Specification for Diesel Fuel Oils"	600.107–08.
ASTM D 1945–91 Standard Test Method for Analysis of Natural Gas By Gas Chromatography.	600.113–93, 600.113–08.

Subpart B—[Amended]

■ 23. A new § 600.101–08 is added to read as follows:

§ 600.101–08 General applicability.

(a) The provisions of this subpart are applicable to 2008 and later model year automobiles, except medium duty passenger vehicles, manufactured on or after January 26, 2007, and to 2011 and later model year medium-duty passenger vehicles. All 2008 automobiles manufactured prior to January 26, 2007 may optionally comply with the provisions of this subpart.

■ 24. A new § 600.106–08 is added to read as follows:

§ 600.106–08 Equipment requirements.

The requirements for test equipment to be used for all fuel economy testing are given in Subparts B and C of part 86 of this chapter.

■ 25. A new § 600.107–08 is added to read as follows:

§ 600.107–08 Fuel specifications.

(a) The test fuel specifications for gasoline, diesel, methanol, and methanol-petroleum fuel mixtures are given in § 86.113 of this chapter, except for cold temperature FTP fuel requirements for diesel and alternative fuel vehicles, which are given in paragraph (b) of this section.

(b)(1) Diesel test fuel used for cold temperature FTP testing must comprise a winter-grade diesel fuel as specified in ASTM D975–04c "Standard Specification for Diesel Fuel Oils" and that complies with part 80 of this chapter. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* Alternatively, EPA may approve the use of a different diesel fuel, provided that the level of kerosene added shall not exceed 20 percent.

(2) The manufacturer may request EPA approval of the use of an alternative fuel for cold temperature FTP testing.

■ 26. A new § 600.109–08 is added to read as follows:

§ 600.109–08 EPA driving cycles.

(a) The FTP driving cycle is prescribed in § 86.115 of this chapter.

(b) The highway fuel economy driving cycle is specified in this paragraph.

(1) The Highway Fuel Economy Driving Schedule is set forth in Appendix I of this part. The driving schedule is defined by a smooth trace drawn through the specified speed versus time relationships.

(2) The speed tolerance at any given time on the dynamometer driving schedule specified in Appendix I of this part, or as printed on a driver's aid chart approved by the Administrator, when conducted to meet the requirements of paragraph (b) of § 600.111 is defined by upper and lower limits. The upper limit is 2 mph higher than the highest point on trace within 1 second of the given time. The lower limit is 2 mph lower than the lowest point on the trace within 1 second of the given time. Speed variations greater than the tolerances (such as may occur during gear changes) are acceptable provided they occur for less than 2 seconds on any occasion. Speeds lower than those prescribed are acceptable provided the vehicle is operated at maximum available power during such occurrences.

(3) A graphic representation of the range of acceptable speed tolerances is found in § 86.115(c) of this chapter.

(c) The US06 driving cycle is set forth in Appendix I of part 86 of this chapter.

(d) The SC03 driving cycle is set forth in Appendix I of part 86 of this chapter.

■ 27. A new § 600.110–08 is added to read as follows:

§ 600.110–08 Equipment calibration.

The equipment used for fuel economy testing must be calibrated according to the provisions of §§ 86.116 and 86.216 of this chapter.

■ 28. A new § 600.111–08 is added to read as follows:

§ 600.111–08 Test procedures.

(a) *FTP testing procedures.* The test procedures to be followed for conducting the FTP test are those prescribed in §§ 86.127 through 86.138 of this chapter, as applicable, except as provided for in paragraph (b)(5) of this section. (The evaporative loss portion of the test procedure may be omitted

unless specifically required by the Administrator.)

(b) *Highway fuel economy testing procedures.* (1) The Highway Fuel Economy Dynamometer Procedure (HFET) consists of preconditioning highway driving sequence and a measured highway driving sequence.

(2) The HFET is designated to simulate non-metropolitan driving with an average speed of 48.6 mph and a maximum speed of 60 mph. The cycle is 10.2 miles long with 0.2 stop per mile and consists of warmed-up vehicle operation on a chassis dynamometer through a specified driving cycle. A proportional part of the diluted exhaust emission is collected continuously for subsequent analysis of hydrocarbons, carbon monoxide, carbon dioxide using a constant volume (variable dilution) sampler. Diesel dilute exhaust is continuously analyzed for hydrocarbons using a heated sample line and analyzer. Methanol and formaldehyde samples are collected and individually analyzed for methanol-fueled vehicles (measurement of methanol and formaldehyde may be omitted for 1993 through 1994 model year methanol-fueled vehicles provided a HFID calibrated on methanol is used for measuring HC plus methanol).

(3) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle must be functioning during all procedures in this subpart. The Administrator may authorize maintenance to correct component malfunction or failure.

(4) *Transmission.* The provisions of § 86.128 of this chapter apply for vehicle transmission operation during highway fuel economy testing under this subpart.

(5) *Road load power and test weight determination.* § 86.129 of this chapter applies for determination of road load power and test weight for highway fuel economy testing. The test weight for the testing of a certification vehicle will be that test weight specified by the Administrator under the provisions of part 86 of this chapter. The test weight for a fuel economy data vehicle will be that test weight specified by the Administrator from the test weights covered by that vehicle configuration. The Administrator will base his selection of a test weight on the relative projected sales volumes of the various test weights within the vehicle configuration.

(6) *Vehicle preconditioning.* The HFET is designed to be performed immediately following the Federal Emission Test Procedure, §§ 86.127 through 86.138 of this chapter. When conditions allow, the tests should be scheduled in this sequence. In the event the tests cannot be scheduled within three hours of the Federal Emission Test Procedure (including one hour hot soak evaporative loss test, if applicable) the vehicle should be preconditioned as in paragraph (b)(6) (i) or (ii) of this section, as applicable.

(i) If the vehicle has experienced more than three hours of soak (68 °F–86 °F) since the completion of the Federal Emission Test Procedure, or has experienced periods of storage outdoors, or in environments where soak temperature is not controlled to 68 °F–86 °F, the vehicle must be preconditioned by operation on a dynamometer through one cycle of the EPA Urban Dynamometer Driving Schedule, § 86.115 of this chapter.

(ii) In unusual circumstances where additional preconditioning is desired by the manufacturer, the provisions of § 86.132(a)(3) of this chapter apply.

(7) *Highway fuel economy dynamometer procedure.* (i) The dynamometer procedure consists of two cycles of the Highway Fuel Economy Driving Schedule (§ 600.109(b)) separated by 15 seconds of idle. The first cycle of the Highway Fuel Economy Driving Schedule is driven to precondition the test vehicle and the second is driven for the fuel economy measurement.

(ii) The provisions of § 86.135 (b), (c), (e), (f), (g), (h) and (i) Dynamometer procedure of this chapter, apply for highway fuel economy testing.

(iii) Only one exhaust sample and one background sample are collected and analyzed for hydrocarbons (except diesel hydrocarbons which are analyzed continuously), carbon monoxide, and carbon dioxide. Methanol and formaldehyde samples (exhaust and dilution air) are collected and analyzed for methanol-fueled vehicles (measurement of methanol and formaldehyde may be omitted for 1993 through 1994 model year methanol-fueled vehicles provided a HFID calibrated on methanol is used for measuring HC plus methanol).

(iv) The fuel economy measurement cycle of the test includes two seconds of idle indexed at the beginning of the second cycle and two seconds of idle indexed at the end of the second cycle.

(8) Engine starting and restarting. (i) If the engine is not running at the initiation of the highway fuel economy test (preconditioning cycle), the start-up procedure must be according to the manufacturer's recommended procedures.

(ii) False starts and stalls during the preconditioning cycle must be treated as in § 86.136(d) and (e). If the vehicle stalls during the measurement cycle of the highway fuel economy test, the test is voided, corrective action may be taken according to § 86.1834–01 as applicable, and the vehicle may be rescheduled for test. The person taking the corrective action shall report the action so that the test records for the vehicle contain a record of the action.

(9) *Dynamometer test run.* The following steps must be taken for each test:

(i) Place the drive wheels of the vehicle on the dynamometer. The vehicle may be driven onto the dynamometer.

(ii) Open the vehicle engine compartment cover and position the cooling fan(s) required. Manufacturers may request the use of additional cooling fans for additional engine compartment or under-vehicle cooling and for controlling high tire or brake temperatures during dynamometer operation.

(iii) Preparation of the CVS must be performed before the measurement highway driving cycle.

(iv) Equipment preparation. The provisions of § 86.137(b)(3) through (6) of this chapter apply for highway fuel economy test except that only one exhaust sample collection bag and one dilution air sample collection bag need be connected to the sample collection systems.

(v) Operate the vehicle over one Highway Fuel Economy Driving Schedule cycle according to the dynamometer driving schedule specified in § 600.109(b).

(vi) When the vehicle reaches zero speed at the end of the preconditioning cycle, the driver has 17 seconds to prepare for the emission measurement cycle of the test.

(vii) Operate the vehicle over one Highway Fuel Economy Driving Schedule cycle according to the dynamometer driving schedule specified in § 600.109(b) while sampling the exhaust gas.

(viii) Sampling must begin two seconds before beginning the first acceleration of the fuel economy measurement cycle and must end two seconds after the end of the deceleration to zero. At the end of the deceleration to zero speed, the roll or shaft revolutions must be recorded.

(10) For alcohol-based dual fuel automobiles, the procedures of § 600.111(a) and (b) shall be performed for each of the fuels on which the vehicle is designed to operate.

(c) *US06 Testing procedures*. The test procedures to be followed for conducting the US06 test are those prescribed in § 86.159 of this chapter, as applicable.

(d) *SC03 testing procedures*. The test procedures to be followed for conducting the SC03 test are prescribed in §§ 86.160 through 161 of this chapter, as applicable.

(e) *Cold temperature FTP procedures*. The test procedures to be followed for conducting the cold temperature FTP test are generally prescribed in subpart C of part 86 of this chapter, as applicable. For the purpose of fuel economy labeling, diesel vehicles are subject to cold temperature FTP testing, but are not required to measure particulate matter, as described in § 86.210–08 of this chapter.

■ 29. A new § 600.112–08 is added to read as follows:

§ 600.112–08 Exhaust sample analysis.

The exhaust sample analysis must be performed according to § 86.140, or § 86.240 of this chapter, as applicable.

■ 30. A new § 600.113–08 is added to read as follows:

§ 600.113–08 Fuel economy calculations for FTP, HFET, US06, SC03 and cold temperature FTP tests.

The Administrator will use the calculation procedure set forth in this paragraph for all official EPA testing of vehicles fueled with gasoline, diesel, alcohol-based or natural gas fuel. The calculations of the weighted fuel economy values require input of the weighted grams/mile values for total hydrocarbons (HC), carbon monoxide (CO), and carbon dioxide (CO_2); and, additionally for methanol-fueled automobiles, methanol (CH_3OH) and formaldehyde (HCHO); and additionally for natural gas-fueled vehicles non-methane hydrocarbons (NMHC) and methane (CH_4) for the FTP, HFET, US06, SC03 and cold temperature FTP tests. Additionally, the specific gravity, carbon weight fraction and net heating value of the test fuel must be determined. The FTP, HFET, US06, SC03 and cold temperature FTP fuel economy values shall be calculated as specified in this section. An example appears in Appendix II of this part.

(a) Calculate the FTP fuel economy.

(1) Calculate the weighted grams/mile values for the FTP test for HC, CO and CO_2; and, additionally for methanol-fueled automobiles, CH_3OH and HCHO; and additionally for natural gas-fueled automobiles NMHC and CH_4 as specified in § 86.144 of this chapter. Measure and record the test fuel's properties as specified in paragraph (f) of this section.

(2) Calculate separately the grams/mile values for the cold transient phase, stabilized phase and hot transient phase of the FTP test. For vehicles with more than one source of propulsion energy, one of which is a rechargeable energy storage system, or vehicles with special features that the Administrator determines may have a rechargeable energy source, whose charge can vary during the test, calculate separately the grams/mile values for the cold transient phase, stabilized phase, hot transient phase and hot stabilized phase of the FTP test.

(b) Calculate the HFET fuel economy.

(1) Calculate the mass values for the highway fuel economy test for HC, CO and CO_2, and where applicable CH_3OH, HCHO, NMHC and CH_4 as specified in § 86.144(b) of this chapter. Measure and record the test fuel's properties as specified in paragraph (f) of this section.

(2) Calculate the grams/mile values for the highway fuel economy test for HC, CO and CO_2, and where applicable CH_3OH, HCHO, NMHC and CH_4 by dividing the mass values obtained in paragraph (b)(1) of this section, by the actual distance traveled, measured in miles, as specified in § 86.135(h) of this chapter.

(c) Calculate the cold temperature FTP fuel economy.

(1) Calculate the weighted grams/mile values for the cold temperature FTP test for HC, CO and CO_2; and, additionally for methanol-fueled automobiles, CH_3OH and HCHO; and additionally for natural gas-fueled automobiles NMHC and CH_4 as specified in § 86.244 of this chapter. For 2008 through 2010 diesel-fueled vehicles, HC measurement is optional.

(2) Calculate separately the grams/mile values for the cold transient phase, stabilized phase and hot transient phase of the cold temperature FTP test in § 86.244 of this chapter.

(3) Measure and record the test fuel's properties as specified in paragraph (f) of this section.

(d) Calculate the US06 fuel economy.

(1) Calculate the total grams/mile values for the US06 test for HC, CO and CO_2; and where applicable CH_3OH, HCHO, NMHC and CH_4, as specified in § 86.164 of this chapter.

(2) Calculate separately the grams/mile values for HC, CO and CO_2; and where applicable CH_3OH, HCHO, NMHC and CH_4, for both the US06 City phase and the US06 Highway phase of the US06 test as specified in § 86.164 of this chapter. In lieu of directly measuring the emissions of the separate city and highway phases of the US06 test according to the provisions of § 86.159 of this chapter, the manufacturer may, with the advance approval of the Administrator and using good engineering judgment, optionally analytically determine the grams/mile values for the city and highway phases of the US06 test. To analytically determine US06 City and US06 Highway phase emission results, the manufacturer shall multiply the US06 total grams/mile values determined in paragraph (d)(1) of this section by the estimated proportion of fuel use for the city and highway phases relative to the total US06 fuel use. The manufacturer may estimate the proportion of fuel use for the US06 City and US06 Highway phases by using modal HC, CO, and CO_2 emissions data, or by using appropriate OBD data (*e.g.*, fuel flow rate in grams of fuel per second), or another method approved by the Administrator.

(3) Measure and record the test fuel's properties as specified in paragraph (f) of this section.

(e) Calculate the grams/mile values for the SC03 test for HC, CO and CO_2; and additionally for methanol-fueled automobiles, CH_3OH and HCHO; and additionally for natural gas-fueled automobiles NMHC and CH_4 as specified in § 86.144 of this chapter. Measure and record the test fuel's properties as specified in paragraph (f) of this section.

(f)(1) Gasoline test fuel properties shall be determined by analysis of a fuel sample taken from the fuel supply. A sample shall be taken after each addition of fresh fuel to the fuel supply. Additionally, the fuel shall be resampled once a month to account for any fuel property changes during storage. Less frequent resampling may be permitted if EPA concludes, on the basis of manufacturer-supplied data, that the properties of test fuel in the manufacturer's storage facility will remain stable for a period longer than one month. The fuel samples shall be analyzed to determine the following fuel properties:

(i) Specific gravity per ASTM D 1298–85 (Reapproved 1990) ''Standard Practice for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method''. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West

Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(ii) Carbon weight fraction per ASTM D 3343–90 ''Standard Test Method for Estimation of Hydrogen Content of Aviation Fuels.'' This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(iii) Net heating value (Btu/lb) per ASTM D 3338–92 ''Standard Test Method for Estimation of Net Heat of Combustion of Aviation Fuels.'' This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(2) Methanol test fuel shall be analyzed to determine the following fuel properties:

(i) Specific gravity using either:

(A) ASTM D 1298–85 (Reapproved 1990) ''Standard Practice for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method'' for the blend. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html* or:

(B) ASTM D 1298–85 (Reapproved 1990) ''Standard Practice for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method'' for the gasoline fuel component and also for the methanol fuel component and combining as follows. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

$SG = SG_g \times$ volume fraction gasoline $+ SG_m \times$ volume fraction methanol.

(ii)(A) Carbon weight fraction using the following equation:

$$CWF = CWF_g \times MF_g + 0.375 \times MF_m$$

Where:

CWF_g = Carbon weight fraction of gasoline portion of blend per ASTM D 3343–90 ''Standard Test Method for Estimation of Hydrogen Content of Aviation Fuels.'' This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

MF_g=Mass fraction gasoline=$(G \times SG_g)/(G \times SG_g + M \times SG_m)$

MF_m=Mass fraction methanol=$(M \times SG_m)/(G \times SG_g + M \times SG_m)$

Where:

G=Volume fraction gasoline.

M=Volume fraction methanol.

SG_g=Specific gravity of gasoline as measured by ASTM D 1298–85 (Reapproved 1990) ''Standard Practice for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method.'' This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW, Room 3340, Washington DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

SG_m=Specific gravity of methanol as measured by ASTM D 1298–85 (Reapproved 1990) ''Standard Practice for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method.'' This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW, Room 3340, Washington DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(B) Upon the approval of the Administrator, other procedures to measure the carbon weight fraction of the fuel blend may be used if the manufacturer can show that the procedures are superior to or equally as accurate as those specified in this paragraph (f)(2)(ii).

(iii) Net heating value (BTU/lb) per ASTM D 240–92 ''Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter.'' This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW, Room 3340, Washington DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(3) Natural gas test fuel shall be analyzed to determine the following fuel properties:

(i) Fuel composition per ASTM D 1945–91 ''Standard Test Method for Analysis of Natural Gas By Gas Chromatography.'' This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(ii) Specific gravity (based on fuel composition per ASTM D 1945–91 ''Standard Test Method for Analysis of Natural Gas by Gas Chromatography.'') This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(iii) Carbon weight fraction based on the carbon contained only in the HC constituents of the fuel=weight of carbon in HC constituents divided by the total weight of fuel.

(iv) Carbon weight fraction of fuel=total weight of carbon in the fuel (*i.e.*, includes carbon contained in HC and in CO_2) divided by total weight of fuel.

(g) Calculate separate FTP, highway, US06, SC03 and Cold temperature FTP fuel economy from the grams/mile values for total HC, CO, CO_2 and, where applicable, CH_3OH, HCHO, NMHC and CH_4 and, the test fuel's specific gravity, carbon weight fraction, net heating value, and additionally for natural gas, the test fuel's composition. The emission values (obtained per paragraph (a) through (e) of this section, as applicable) used in each calculation of this section shall be rounded in accordance with § 86.094–26(a)(6)(iii) or § 86.1837–01 of this chapter as applicable. The CO_2 values (obtained per this section, as applicable) used in each calculation of this section shall be rounded to the nearest gram/mile. The specific gravity and the carbon weight fraction (obtained per paragraph (f) of this section) shall be recorded using three places to the right of the decimal point. The net heating value (obtained per paragraph (f) of this section) shall be recorded to the nearest whole Btu/lb.

(h)(1) For gasoline-fueled automobiles tested on test fuel specified in § 86.113–04(a), the fuel economy in miles per gallon is to be calculated using the following equation:

$$mpg = (5174 \times 10^4 \times C \times CWF \times SG)/[((CWF \times HC) + (0.429 \times CO) + (0.273 \times CO_2)) \times ((0.6 \times SG \times NHV) + 5471)]$$

Where:

HC = Grams/mile HC as obtained in paragraph (g) of this section.

CO = Grams/mile CO as obtained in paragraph (g) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g) of this section.

CWF = Carbon weight fraction of test fuel as obtained in paragraph (g) of this section.

NHV = Net heating value by mass of test fuel as obtained in paragraph (g) of this section.

SG = Specific gravity of test fuel as obtained in paragraph (g) of this section.

(2) Round the calculated result to the nearest 0.1 miles per gallon.

(i)(1) For diesel-fueled automobiles, calculate the fuel economy in miles per gallon of diesel fuel by dividing 2778 by the sum of three terms:

(i) (A) 0.866 multiplied by HC (in grams/miles as obtained in paragraph (g) of this section) or

(B) zero, in the case of cold FTP diesel tests for which HC was not collected, as permitted in § 600.113–08(c);

(ii) 0.429 multiplied by CO (in grams/mile as obtained in paragraph (g) of this section); and

(iii) 0.273 multiplied by CO_2 (in grams/mile as obtained in paragraph (g) of this section).

(2) Round the quotient to the nearest 0.1 mile per gallon.

(j) For methanol-fueled automobiles and automobiles designed to operate on mixtures of gasoline and methanol, the fuel economy in miles per gallon is to be calculated using the following equation:

$$mpg = (CWF \times SG \times 3781.8)/((CWF_{exHC} \times HC) + (0.429 \times CO) + (0.273 \times CO_2) + (0.375 \times CH_3OH) + (0.400 \times HCHO))$$

CWF = Carbon weight fraction of the fuel as determined in paragraph (f)(2)(ii) of this section.

SG = Specific gravity of the fuel as determined in paragraph (f)(2)(i) of this section.

CWF_{exHC} = Carbon weight fraction of exhaust hydrocarbons = CWF_g as determined in (f)(2)(ii) of this section (for M100 fuel, CWF_{exHC} = 0.866).

HC = Grams/mile HC as obtained in paragraph (g) of this section.

CO = Grams/mile CO as obtained in paragraph (g) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g) of this section.

CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (d) of this section.

HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g) of this section.

(k) For automobiles fueled with natural gas, the fuel economy in miles per gallon of natural gas is to be calculated using the following equation:

$$mpg_e = \frac{CWF_{HC/NG} D_{NG} 121.5}{(0.749)\ CH_4 + (CWF_{NMHC}) + (0.429)\ CO + (0.273)(CO_2 - CO_{2NG})}$$

Where:

mpg_e=miles per equivalent gallon of natural gas.

$CWF_{HC/NG}$=carbon weight fraction based on the hydrocarbon constituents in the natural gas fuel as obtained in paragraph (g) of this section.

D_{NG}=density of the natural gas fuel [grams/ft3 at 68 °F (20 °C) and 760 mm Hg (101.3 kPa)] pressure as obtained in paragraph (g) of this section.

CH_4, NMHC, CO, and CO_2=weighted mass exhaust emissions [grams/mile] for methane, non-methane HC, carbon monoxide, and carbon dioxide as calculated in § 600.113.

CWF_{NMHC}=carbon weight fraction of the non-methane HC constituents in the fuel as determined from the speciated fuel composition per paragraph (f)(3) of this section.

CO_{2NG}=grams of carbon dioxide in the natural gas fuel consumed per mile of travel.

$CO_{2NG}=FC_{NG}\ D_{NG}\ WF_{CO2}$

Where:

$$FC_{NG} = \text{cubic feet of natural gas fuel consumed per mile} = \frac{(0.749)\ CH_4 + (CWF_{NMHC})\,NMHC + (0.429)\,CO + (0.273)\,(CO_2)}{CWF_{NG}\ D_{NG}}$$

Where:

CWF_{NG} = the carbon weight fraction of the natural gas fuel as calculated in paragraph (f) of this section.

WF_{CO2} = weight fraction carbon dioxide of the natural gas fuel calculated using the mole fractions and molecular weights of the natural gas fuel constituents per ASTM D 1945–91 ''Standard Test Method for Analysis of Natural Gas by Gas Chromatography.'' This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(l) Equations for fuels other than those specified in paragraphs (h) through (k) of this section may be used with advance EPA approval.

■ 31. A new § 600.114–08 is added to read as follows:

§ 600.114–08 Vehicle-specific 5-cycle fuel economy calculations.

This section applies to data used for fuel economy labeling under Subpart D of this part.

(a) *City fuel economy.* For each vehicle tested under § 600.010–08(c)(i) and (ii), determine the 5-cycle city fuel economy using the following equation:

$$(1)\ \text{City FE} = 0.905 \times \frac{1}{(\text{Start FC} + \text{Running FC})}$$

Where:

$$\text{(i) Start FC (gallons per mile)} = 0.33 \times \left(\frac{(0.76 \times \text{Start Fuel}_{75} + 0.24 \times \text{Start Fuel}_{20})}{4.1} \right)$$

Where:

$$\text{Start Fuel}_x = 3.6 \times \left(\frac{1}{\text{Bag 1 FE}_x} - \frac{1}{\text{Bag 3 FE}_x} \right)$$

Where:

Bag Y FE_x = the fuel economy in miles per gallon of fuel during the specified bag of the FTP test conducted at an ambient temperature of 75 °F or 20 °F,

and,

$$\text{(ii) Running FC} = 0.82 \times \left[\frac{0.48}{\text{Bag } 2_{75}\ \text{FE}} + \frac{0.41}{\text{Bag } 3_{75}\ \text{FE}} + \frac{0.11}{\text{US06 City FE}} \right] + 0.18 \times \left[\frac{0.5}{\text{Bag } 2_{20}\ \text{FE}} + \frac{0.5}{\text{Bag } 3_{20}\ \text{FE}} \right] + 0.133 \times 1.083 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{0.61}{\text{Bag } 3_{75}\ \text{FE}} + \frac{0.39}{\text{Bag } 2_{75}\ \text{FE}} \right) \right]$$

Where:

US06 City FE = fuel economy in miles per gallon over the ''city'' portion of the US06 test,

HFET FE = fuel economy in miles per gallon over the HFET test,

SC03 FE = fuel economy in miles per gallon over the SC03 test.

(b) *Highway fuel economy.* (1) For each vehicle tested under §§ 600.010–08(a) and (c)(1)(ii)(B), determine the 5-

cycle highway fuel economy using the following equation:

$$\text{Highway FE} = 0.905 \times \frac{1}{\text{Start FC} + \text{Running FC}}$$

Where:

$$\text{(i) Start FC} = 0.33 \times \left(\frac{(0.76 \times \text{Start Fuel}_{75}) + (0.24 \times \text{Start Fuel}_{20})}{60} \right)$$

Where:

$$\text{Start Fuel}_x = 3.6 \times \left(\frac{1}{\text{Bag 1 FE}_x} - \frac{1}{\text{Bag 3 FE}_x} \right)$$

and,

$$\text{(ii) Running FC} = 1.007 \times \left[\frac{0.79}{\text{US06 Highway FE}} + \frac{0.21}{\text{HFET FE}} \right] + 0.133 \times 0.377 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{0.61}{\text{Bag 3}_{75}\text{FE}} + \frac{0.39}{\text{Bag 2}_{75}\text{FE}} \right) \right]$$

Where:

US06 Highway FE = fuel economy in mile per gallon over the highway portion of the US06 test,

HFET FE = fuel economy in mile per gallon over the HFET test,

SC03 FE = fuel economy in mile per gallon over the SC03 test.

(2) If the condition specified in § 600.115–08(b)(2)(iii)(B) is met, in lieu of using the calculation in paragraph (b)(1) of this section, the manufacturer may optionally determine the highway fuel economy using the following modified 5-cycle equation which utilizes data from FTP, HFET, and US06 tests, and applies mathematic adjustments for Cold FTP and SC03 conditions:

(i) Perform a US06 test in addition to the FTP and HFET tests.

(ii) Determine the 5-cycle highway fuel economy according to the following formula:

$$\text{Highway FE} = 0.905 \times \frac{1}{\text{Start FC} + \text{Running FC}}$$

Where:

$$\text{(A) Start FC} = 0.33 \times \left(\frac{(0.0055155 + 1.13637 \times \text{Start Fuel}_{75})}{60.0} \right)$$

Where:

$$\text{Start Fuel}_{75} = 3.6 \times \left(\frac{1}{\text{Bag 1 FE}_{75}} - \frac{1}{\text{Bag 3 FE}_{75}} \right)$$

Bag y FE_{75} = the fuel economy in miles per gallon of fuel during the specified bag of the FTP test conducted at an ambient temperature of 75 °F.

$$\text{(B) Running FC} = 1.007 \times \left[\frac{0.79}{\text{US06 Highway FE}} + \frac{0.21}{\text{HFET FE}}\right] + \left[0.377 \times 0.133 \times \left(0.00540 + \frac{0.1357}{\text{US06 FE}}\right)\right]$$

Where:

US06 Highway FE = fuel economy in miles per gallon over the highway portion of the US06 test.

HFET FE = fuel economy in miles per gallon over the HFET test.

US06 FE = fuel economy in miles per gallon over the entire US06 test.

(c) *Fuel economy calculations for hybrid electric vehicles.* Under the requirements of § 86.1811–04(n), hybrid electric vehicles are subject to California test methods which require FTP emission sampling for the 75 °F FTP test over four phases (bags) of the UDDS (cold-start, transient, warm-start, transient). Optionally, these four phases may be combined into two phases (phases 1 + 2 and phases 3 + 4). Calculations for these sampling methods follow.

(1) *Four-bag FTP equations.* If the 4-bag sampling method is used, manufacturers may use the equations in paragraphs (a) and (b) of this section to determine city and highway fuel economy estimates. If this method is chosen, it must be used to determine both city and highway fuel economy. Optionally, the following calculations may be used, provided that they are used to determine both city and highway fuel economy:

(i) *City fuel economy.*

$$\text{City FE} = 0.905 \times \frac{1}{(\text{Start FC} + \text{Running FC})}$$

Where:

$$\text{(A) Start FC (gallons per mile)} = 0.33 \times \left(\frac{(0.76 \times \text{Start Fuel}_{75} + 0.24 \times \text{Start Fuel}_{20})}{4.1}\right)$$

Where:

$$(1)\ \text{Start Fuel}_{75} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{75}} - \frac{1}{\text{Bag 3 FE}_{75}}\right] + 3.9 \times \left[\frac{1}{\text{Bag 2 FE}_{75}} - \frac{1}{\text{Bag 4 FE}_{75}}\right]$$

and

$$(2)\ \text{Start Fuel}_{20} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}}\right]$$

(B) Running FC (gallons per mile) =

$$0.82 \times \left[\frac{0.48}{\text{Bag 4}_{75}\ \text{FE}} + \frac{0.41}{\text{Bag 3}_{75}\ \text{FE}} + \frac{0.11}{\text{US06 City FE}}\right] + 0.18 \times \left[\frac{0.5}{\text{Bag 2}_{20}\ \text{FE}} + \frac{0.5}{\text{Bag 3}_{20}\ 3\ \text{FE}}\right]$$
$$+ 0.133 \times 1.083 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{0.61}{\text{Bag 3}_{75}\ \text{FE}} + \frac{0.39}{\text{Bag 4}_{75}\ \text{FE}}\right)\right]$$

Where:

US06 Highway FE = fuel economy in miles per gallon over the city portion of the US06 test.

US06 Highway FE = fuel economy in miles per gallon over the Highway portion of the US06 test.

HFET FE = fuel economy in miles per gallon over the HFET test.

SC03 FE = fuel economy in miles per gallon over the SC03 test.

(ii) *Highway fuel economy.*

$$\text{Highway FE} = 0.905 \times \frac{1}{\text{Start FC} + \text{Running FC}}$$

Where:

$$\text{(A) Start FC} = 0.33 \times \frac{\left(0.76 \times \text{Start Fuel}_{75} + 0.24 \times \text{Start Fuel}_{20}\right)}{60}$$

Where:

$$\text{Start Fuel}_{75} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{75}} - \frac{1}{\text{Bag 3 FE}_{75}}\right] + 3.9 \times \left[\frac{1}{\text{Bag 2 FE}_{75}} - \frac{1}{\text{Bag 4 FE}_{75}}\right]$$

$$\text{Start Fuel}_{20} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}}\right]$$

$$\text{(B) Running FC} = 1.007 \times \left[\frac{0.79}{\text{US06 Highway FE}} - \frac{0.21}{\text{HFET FE}}\right] + 0.133 \times 0.377 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{0.61}{\text{Bag 3}_{75}\text{ FE}} + \frac{0.39}{\text{Bag 4}_{75}\text{ FE}}\right)\right]$$

Where:

US06 Highway FE = fuel economy in miles per gallon over the Highway portion of the US06 test,

HFET FE = fuel economy in miles per gallon over the HFET test,

SC03 FE = fuel economy in miles per gallon over the SC03 test.

(2) *Two-bag FTP equations.* If the 2-bag sampling method is used for the 75 °F FTP test, it must be used to determine both city and highway fuel economy. The following calculations must be used to determine both city and highway fuel economy:

(i) *City fuel economy.*

$$\text{City FE} = 0.905 \times \frac{1}{\text{Start FC} + \text{Running FC}}$$

Where:

$$\text{(A) Start FC} = 0.33 \times \frac{\left(0.76 \times \text{Start Fuel}_{75} + 0.24 \times \text{Start Fuel}_{20}\right)}{4.1}$$

Where:

$$\text{Start Fuel}_{75} = 7.5 \times \left[\frac{1}{\text{Bag 1/2 FE}_{75}} - \frac{1}{\text{Bag 3/4 FE}_{75}}\right]$$

$$\text{Start Fuel}_{20} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}}\right]$$

Where:

Bag y FE_{20} = the fuel economy in miles per gallon of fuel during Bag 1 or Bag 3 of the 20 °F FTP test.

Bag x/y FE_x = fuel economy in miles per gallon of fuel during combined phases 1 and 2 or phases 3 and 4 of the FTP test conducted at an ambient temperature of 75 °F.

$$\text{(B) Running FC} = 0.82 \times \left[\frac{0.90}{\text{Bag } 3/4_{75} \text{ FE}} + \frac{0.10}{\text{US06 City FE}} \right] + 0.18 \times \left[\frac{0.5}{\text{Bag } 2_{20} \text{ FE}} + \frac{0.5}{\text{Bag } 3_{20} \text{ FE}} \right] + 0.133 \times 1.083 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{1.0}{\text{Bag } 3/4_{75} \text{ FE}} \right) \right]$$

Where:

US06 City FE = fuel economy in miles per gallon over the city portion of the US06 test,

SC03 FE = fuel economy in miles per gallon over the SC03 test.

Bag x/y FE_x = fuel economy in miles per gallon of fuel during combined phases 1 and 2 or phases 3 and 4 of the FTP test conducted at an ambient temperature of 75 °F.

(ii) *Highway fuel economy.*

$$\text{Highway FE} = 0.905 \times \frac{1}{\text{Start FC} + \text{Running FC}}$$

Where:

$$\text{(A) Start FC} = 0.33 \times \frac{(0.76 \times \text{Start Fuel}_{75} + 0.24 \times \text{Start Fuel}_{20})}{60}$$

Where:

$$\text{Start Fuel}_{75} = 7.5 \times \left[\frac{1}{\text{Bag 1/2 FE}_{75}} - \frac{1}{\text{Bag 3/4 FE}_{75}} \right]$$

and

$$\text{Start Fuel}_{20} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}} \right]$$

and

$$\text{(B) Running FC} = 1.007 \times \left[\frac{0.79}{\text{US06 Highway FE}} + \frac{0.21}{\text{HFET FE}} \right] + 0.133 \times 0.377 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{1.0}{\text{Bag } 3/4_{75} \text{ FE}} \right) \right]$$

Where:

US06 Highway FE = fuel economy in miles per gallon over the city portion of the US06 test,

SC03 FE = fuel economy in miles per gallon over the SC03 test.

Bag y FE_{20} = the fuel economy in miles per gallon of fuel during Bag 1 or Bag 3 of the 20 °F FTP test.

Bag x/y FE_x = fuel economy in miles per gallon of fuel during phases 1 and 2 or phases 3 and 4 of the FTP test conducted at an ambient temperature of 75°F.

(3) For hybrid electric vehicles using the modified 5-cycle highway calculation in paragraph (b)(2) of this section, the equation in paragraph (b)(2)(ii)(A) of this section, applies except that the equation for Start $Fuel_{75}$ will be replaced with one of the following:

(i) The equation for Start $Fuel_{75}$ for hybrids tested according to the 4-bag FTP is:

$$\text{Start Fuel}_{75} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE } 75_{75}} - \frac{1}{\text{Bag 3 FE}_{75}} \right] + 3.9 \times \left[\frac{1}{\text{Bag 2 FE}_{75}} - \frac{1}{\text{Bag 4 FE}_{75}} \right]$$

(ii) The equation for Start $Fuel_{75}$ for hybrids tested according to the 2-bag FTP is:

$$\text{Start Fuel}_{75} = 7.5 \left[\frac{1}{\text{Bag 1/2 FE}_{75}} - \frac{1}{\text{Bag 3/4 FE}_{75}} \right]$$

32. A new § 600.115–is added to read as follows:

§ 600.115–08 Criteria for determining the fuel economy label calculation method for 2011 and later model year vehicles.

This section provides the criteria to determine if the derived 5-cycle method for determining fuel economy label values, as specified in § 600.210–08 (a)(2) or (b)(2), as applicable, may be used to determine label values for 2011 and later model year vehicles. Separate criteria apply to city and highway fuel economy for each test group. The provisions of this section are optional. If this option is not chosen, or if the criteria provided in this section are not met, fuel economy label values for 2011 and later model year vehicles must be determined according to the vehicle-specific 5-cycle method specified in § 600.210–08(a)(1) or (b)(1), as applicable.

(a) *City fuel economy criterion.* (1) For each test group certified for emission compliance under § 86.1848–01 of this chapter, the FTP, HFET, US06, SC03 and Cold FTP tests determined to be official under § 86.1835–01 of this chapter are used to calculate the vehicle-specific 5-cycle city fuel economy which is then compared to the derived 5-cycle city fuel economy, as follows:

(i) The vehicle-specific 5-cycle city fuel economy from the official FTP, HFET, US06, SC03 and Cold FTP tests for the test group is determined according to the provisions of § 600.114–08(a) and rounded to the nearest one tenth of a mile per gallon.

(ii) Using the same FTP data as used in paragraph (a)(i) of this section, the corresponding derived 5-cycle city fuel economy is calculated according to the following equation:

$$\text{Derived 5-cycle city fuel economy} = \frac{1}{\left(\{\text{City Intercept}\} + \frac{\{\text{City Slope}\}}{\text{FTP FE}} \right)}$$

Where:

City Intercept = Intercept determined by the Administrator. See § 600.210–08(a)(2)(iii).

City Slope = Slope determined by the Administrator. See § 600.210–08(a)(2)(iii.)

FTP FE = the FTP-based city fuel economy from the official test used forcertification compliance, determined under § 600.113–08(a), rounded to the nearest tenth.

(2) The derived 5-cycle fuel economy value determined in paragraph (a)(1)(ii) of this section is multiplied by 0.96 and rounded to the nearest one tenth of a mile per gallon.

(3) If the vehicle-specific 5-cycle city fuel economy determined in paragraph (a)(1)(i) of this section is greater than or equal to the value determined in paragraph (a)(2) of this section, then the manufacturer may base the city fuel economy estimates for the model types covered by the test group on the derived 5-cycle method specified in § 600.210–08(a)(2) or (b)(2), as applicable.

(b) *Highway fuel economy criterion.* The determination for highway fuel economy depends upon the outcome of the determination for city fuel economy in paragraph (a)(3) of this section for each test group.

(1) If the city determination for a test group made in paragraph (a)(3) of this section does not allow the use of the derived 5-cycle method, then the highway fuel economy values for all model types represented by the test group are likewise not allowed to be determined using the derived 5-cycle method, and must be determined according to the vehicle-specific 5-cycle method specified in § 600.210–08(a)(1) or (b)(1), as applicable.

(2) If the city determination made in paragraph (a)(3) of this section allows the use of the derived 5-cycle method, a separate determination is made for the highway fuel economy labeling method as follows:

(i) For each test group certified for emission compliance under § 86.1848–01 of this chapter, the FTP, HFET, US06, SC03 and Cold FTP tests determined to be official under § 86.1835–01 of this chapter are used to calculate the vehicle-specific 5-cycle highway fuel economy, which is then compared to the derived 5-cycle highway fuel economy, as follows:

(A) The vehicle-specific 5-cycle highway fuel economy from the official FTP, HFET, US06, SC03 and Cold FTP tests for the test group is determined according to the provisions of § 600.114–08(b)(1) and rounded to the nearest one tenth of a mile per gallon.

(B) Using the same HFET data as used in paragraph (b)(2)(i)(A) of this section, the corresponding derived 5-cycle highway fuel economy is calculated using the following equation:

$$\text{Derived 5-cycle highway fuel economy} = \frac{1}{\left(\{\text{Highway Intercept}\} + \frac{\{\text{Highway Slope}\}}{\text{HFET FE}} \right)}$$

Where:

Highway Intercept = Intercept determined by the Administrator. See § 600.210–08(a)(2)(iii).

Highway Slope = Slope determined by the Administrator. See § 600.210–08(a)(2)(iii).

HFET FE = the HFET-based highway fuel economy determined under § 600.113–08(b), rounded to the nearest tenth.

(ii) The derived 5-cycle highway fuel economy calculated in paragraph (b)(2)(i)(B) of this section is multiplied by 0.95 and rounded to the nearest one tenth of a mile per gallon.

(iii) (A) If the vehicle-specific 5-cycle highway fuel economy of the vehicle tested in paragraph (b)(2)(i)(A) of this section is greater than or equal to the value determined in paragraph (b)(2)(ii) of this section, then the manufacturer may base the highway fuel economy estimates for the model types covered by the test group on the derived 5-cycle method specified in § 600.210–08(a)(2) or (b)(2), as applicable.

(B) If the vehicle-specific 5-cycle highway fuel economy determined in paragraph (b)(2)(i)(A) of this section is less than the value determined in paragraph (b)(2)(ii) of this section, the manufacturer may determine the highway fuel economy for the model types covered by the test group on the modified 5-cycle equation specified in § 600.114–08(b)(2).

(c) The manufacturer will apply the criteria in paragraph (a) and (b) of this section to every test group for each model year.

(d) The tests used to make the evaluations in paragraphs (a) and (b) of this section will be the official tests used to determine compliance with emission standards under § 86.1835–01(c). Adjustments and/or substitutions to the official test data may be made with advance approval of the Administrator.

Subpart C—[Amended]

■ 33. A new § 600.201–08 is added to read as follows:

§ 600.201–08 General applicability.

(a) The provisions of this subpart are applicable to 2008 and later model year automobiles, except medium duty passenger vehicles, manufactured on or after January 26, 2007, and to 2011 and later model year medium-duty passenger vehicles. All 2008 automobiles manufactured prior to January 26, 2007 may optionally comply with the provisions of this subpart.

■ 34. A new § 600.206–08 is added to read as follows:

§ 600.206–08 Calculation and use of FTP-based and HFET-based fuel economy values for vehicle configurations.

(a) Fuel economy values determined for each vehicle under § 600.113(a) and (b) and as approved in § 600.008–08 (c), are used to determine FTP-based city, HFET-based highway, and combined FTP/Highway-based fuel economy values for each vehicle configuration for which data are available.

(1) If only one set of FTP-based city and HFET-based highway fuel economy values is accepted for a vehicle configuration, these values, rounded to the nearest tenth of a mile per gallon, comprise the city and highway fuel economy values for that configuration.

(2) If more than one set of FTP-based city and HFET-based highway fuel economy values are accepted for a vehicle configuration:

(i) All data shall be grouped according to the subconfiguration for which the data were generated using sales projections supplied in accordance with § 600.208(a)(3).

(ii) Within each group of data, all values are harmonically averaged and rounded to the nearest 0.0001 of a mile per gallon in order to determine FTP-based city and HFET-based highway fuel economy values for each subconfiguration at which the vehicle configuration was tested.

(iii) All FTP-based city fuel economy values and all HFET-based highway fuel economy values calculated in paragraph (a)(2)(ii) of this section are (separately for city and highway) averaged in proportion to the sales fraction (rounded to the nearest 0.0001) within the vehicle configuration (as provided to the Administrator by the manufacturer) of vehicles of each tested subconfiguration. The resultant values, rounded to the nearest 0.0001 mile per gallon, are the FTP-based city and HFET-based highway fuel economy values for the vehicle configuration.

(3) For the purpose of determining average fuel economy under § 600.510–08, the combined fuel economy value for a vehicle configuration is calculated by harmonically averaging the FTP-based city and HFET-based highway fuel economy values, as determined in § 600.206(a)(1) or (2) of this section, weighted 0.55 and 0.45 respectively, and rounded to the nearest 0.0001 mile per gallon. A sample of this calculation appears in Appendix II of this part.

(4) For alcohol dual fuel automobiles and natural gas dual fuel automobiles the procedures of paragraphs (a)(1) or (2) of this section, as applicable, shall be used to calculate two separate sets of FTP-based city, HFET-based highway, and combined fuel economy values for each configuration.

(i) Calculate the city, highway, and combined fuel economy values from the tests performed using gasoline or diesel test fuel.

(ii) Calculate the city, highway, and combined fuel economy values from the tests performed using alcohol or natural gas test fuel.

(b) If only one equivalent petroleum-based fuel economy value exists for an electric configuration, that value, rounded to the nearest tenth of a mile per gallon, will comprise the petroleum-based fuel economy for that configuration.

(c) If more than one equivalent petroleum-based fuel economy value exists for an electric vehicle configuration, all values for that vehicle configuration are harmonically averaged and rounded to the nearest 0.0001 mile per gallon for that configuration.

■ 35. A new § 600.207–08 is added to read as follows:

§ 600.207–08 Calculation and use of vehicle-specific 5-cycle-based fuel economy values for vehicle configurations.

(a) Fuel economy values determined for each vehicle under § 600.114–08 and as approved in § 600.008–08 (c), are used to determine vehicle-specific 5-cycle city and highway fuel economy values for each vehicle configuration for which data are available.

(1) If only one set of 5-cycle city and highway fuel economy values is accepted for a vehicle configuration, these values, rounded to the nearest tenth of a mile per gallon, comprise the city and highway fuel economy values for that configuration.

(2) If more than one set of 5-cycle city and highway fuel economy values are accepted for a vehicle configuration:

(i) All data shall be grouped according to the subconfiguration for which the data were generated using sales projections supplied in accordance with § 600.209(a)(3).

(ii) Within each subconfiguration of data, all values are harmonically averaged and rounded to the nearest 0.0001 of a mile per gallon in order to determine 5-cycle city and highway fuel economy values for each subconfiguration at which the vehicle configuration was tested.

(iii) All 5-cycle city fuel economy values and all 5-cycle highway fuel economy values calculated in paragraph (a)(2)(ii) of this section are (separately for city and highway) averaged in proportion to the sales fraction (rounded to the nearest 0.0001) within the vehicle configuration (as provided to the Administrator by the manufacturer) of vehicles of each tested subconfiguration. The resultant values, rounded to the nearest 0.0001 mile per gallon, are the 5-cycle city and 5-cycle highway fuel economy values for the vehicle configuration.

(3) [Reserved]

(4) For alcohol dual fuel automobiles and natural gas dual fuel automobiles the procedures of paragraphs (a)(1) and (2) of this section shall be used to calculate two separate sets of 5-cycle city, highway fuel economy values for each configuration.

(i) Calculate the 5-cycle city and highway fuel economy values from the tests performed using gasoline or diesel test fuel.

(ii)(A) Calculate the 5-cycle city and highway fuel economy values from the tests performed using alcohol or natural gas test fuel, if 5-cycle testing has been performed. Otherwise, the procedure in § 600.210(a)(3) or (b)(3) applies.

(b) If only one equivalent petroleum-based fuel economy value exists for an electric configuration, that value, rounded to the nearest tenth of a mile per gallon, will comprise the petroleum-based 5-cycle fuel economy for that configuration.

(c) If more than one equivalent petroleum-based 5-cycle fuel economy value exists for an electric vehicle configuration, all values for that vehicle configuration are harmonically averaged and rounded to the nearest 0.0001 mile per gallon for that configuration.

■ 36. A new § 600.208–08 is added to read as follows:

§ 600.208–08 Calculation of FTP-based and HFET-based fuel economy values for a model type.

(a) Fuel economy values for a base level are calculated from vehicle configuration fuel economy values as determined in § 600.206–08(a), (b), or (c) as applicable, for low-altitude tests.

(1) If the Administrator determines that automobiles intended for sale in the State of California are likely to exhibit significant differences in fuel economy from those intended for sale in other states, he will calculate fuel economy values for each base level for vehicles intended for sale in California and for each base level for vehicles intended for sale in the rest of the states.

(2) In order to highlight the fuel efficiency of certain designs otherwise included within a model type, a manufacturer may wish to subdivide a model type into one or more additional model types. This is accomplished by separating subconfigurations from an existing base level and placing them into a new base level. The new base level is identical to the existing base level except that it shall be considered, for the purposes of this paragraph, as containing a new basic engine. The manufacturer will be permitted to designate such new basic engines and base level(s) if:

(i) Each additional model type resulting from division of another model type has a unique car line name and that name appears on the label and on the vehicle bearing that label;

(ii) The subconfigurations included in the new base levels are not included in any other base level which differs only by basic engine (i.e., they are not included in the calculation of the original base level fuel economy values); and

(iii) All subconfigurations within the new base level are represented by test data in accordance with § 600.010–08(c)(1)(ii).

(3) The manufacturer shall supply total model year sales projections for each car line/vehicle subconfiguration combination.

(i) Sales projections must be supplied separately for each car line-vehicle subconfiguration intended for sale in California and each car line/vehicle subconfiguration intended for sale in the rest of the states if required by the Administrator under paragraph (a)(1) of this section.

(ii) Manufacturers shall update sales projections at the time any model type value is calculated for a label value.

(iii) The provisions of paragraph (a)(3) of this section may be satisfied by providing an amended application for certification, as described in § 86.1844–01.

(4) Vehicle configuration fuel economy values, as determined in § 600.206–08 (a), (b) or (c), as applicable, are grouped according to base level.

(i) If only one vehicle configuration within a base level has been tested, the fuel economy value from that vehicle configuration constitutes the fuel economy for that base level.

(ii) If more than one vehicle configuration within a base level has been tested, the vehicle configuration fuel economy values are harmonically averaged in proportion to the respective sales fraction (rounded to the nearest 0.0001) of each vehicle configuration and the resultant fuel economy value rounded to the nearest 0.0001 mile per gallon.

(5) The procedure specified in paragraph (a)(1) through (4) of this section will be repeated for each base level, thus establishing city, highway, and combined fuel economy values for each base level.

(6) For the purposes of calculating a base level fuel economy value, if the only vehicle configuration(s) within the base level are vehicle configuration(s) which are intended for sale at high altitude, the Administrator may use fuel economy data from tests conducted on these vehicle configuration(s) at high altitude to calculate the fuel economy for the base level.

(7) For alcohol dual fuel automobiles and natural gas dual fuel automobiles, the procedures of paragraphs (a)(1) through (6) of this section shall be used to calculate two separate sets of city, highway, and combined fuel economy values for each base level.

(i) Calculate the city, highway, and combined fuel economy values from the tests performed using gasoline or diesel test fuel.

(ii) Calculate the city, highway, and combined fuel economy values from the tests performed using alcohol or natural gas test fuel.

(b) For each model type, as determined by the Administrator, a city, highway, and combined fuel economy value will be calculated by using the projected sales and fuel economy values for each base level within the model type. Separate model type calculations will be done based on the vehicle configuration fuel economy values as determined in § 600.206–08 (a), (b) or (c), as applicable.

(1) If the Administrator determines that automobiles intended for sale in the State of California are likely to exhibit significant differences in fuel economy from those intended for sale in other states, he will calculate fuel economy values for each model type for vehicles intended for sale in California and for each model type for vehicles intended for sale in the rest of the states.

(2) The sales fraction for each base level is calculated by dividing the projected sales of the base level within the model type by the projected sales of the model type and rounding the quotient to the nearest 0.0001.

(3) The FTP-based city fuel economy values of the model type (calculated to the nearest 0.0001 mpg) are determined by dividing one by a sum of terms, each of which corresponds to a base level and which is a fraction determined by dividing:

(i) The sales fraction of a base level; by

(ii) The FTP-based city fuel economy value for the respective base level.

(4) The procedure specified in paragraph (b)(3) of this section is repeated in an analogous manner to determine the highway and combined fuel economy values for the model type.

(5) For alcohol dual fuel automobiles and natural gas dual fuel automobiles, the procedures of paragraphs (b)(1) through (4) of this section shall be used to calculate two separate sets of city, highway, and combined fuel economy values for each model type.

(i) Calculate the city, highway, and combined fuel economy values from the tests performed using gasoline or diesel test fuel.

(ii) Calculate the city, highway, and combined fuel economy values from the tests performed using alcohol or natural gas test fuel.

■ 37. A new § 600.209–08 is added to read as follows:

§ 600.209–08 Calculation of vehicle-specific 5-cycle fuel economy values for a model type.

(a) *Base level.* 5-cycle fuel economy values for a base level are calculated from vehicle configuration 5-cycle fuel economy values as determined in § 600.207–08 for low-altitude tests.

(1) If the Administrator determines that automobiles intended for sale in the State of California are likely to exhibit significant differences in fuel economy from those intended for sale in other states, he will calculate fuel economy values for each base level for vehicles intended for sale in California and for each base level for vehicles intended for sale in the rest of the states.

(2) In order to highlight the fuel efficiency of certain designs otherwise included within a model type, a manufacturer may wish to subdivide a model type into one or more additional model types. This is accomplished by separating subconfigurations from an existing base level and placing them into a new base level. The new base level is identical to the existing base level except that it shall be considered, for the purposes of this paragraph, as containing a new basic engine. The manufacturer will be permitted to designate such new basic engines and base level(s) if:

(i) Each additional model type resulting from division of another model type has a unique car line name and that name appears on the label and on the vehicle bearing that label;

(ii) The subconfigurations included in the new base levels are not included in any other base level which differs only by basic engine (i.e., they are not included in the calculation of the original base level fuel economy values); and

(iii) All subconfigurations within the new base level are represented by test data in accordance with § 600.010–08 (c)(ii).

(3) The manufacturer shall supply total model year sales projections for each car line/vehicle subconfiguration combination.

(i) Sales projections must be supplied separately for each car line-vehicle subconfiguration intended for sale in California and each car line/vehicle subconfiguration intended for sale in the rest of the states if required by the Administrator under paragraph (a)(1) of this section.

(ii) Manufacturers shall update sales projections at the time any model type value is calculated for a label value.

(iii) The provisions of this paragraph (a)(3) may be satisfied by providing an amended application for certification, as described in § 86.1844–01 of this chapter.

(4) 5-cycle vehicle configuration fuel economy values, as determined in § 600.207–08(a), (b), or (c), as applicable, are grouped according to base level.

(i) If only one vehicle configuration within a base level has been tested, the fuel economy value from that vehicle configuration constitutes the fuel economy for that base level.

(ii) If more than one vehicle configuration within a base level has been tested, the vehicle configuration fuel economy values are harmonically averaged in proportion to the respective sales fraction (rounded to the nearest 0.0001) of each vehicle configuration and the resultant fuel economy value rounded to the nearest 0.0001 mile per gallon.

(5) The procedure specified in § 600.209–08 (a) will be repeated for each base level, thus establishing city and highway fuel economy values for each base level.

(6) For the purposes of calculating a base level fuel economy value, if the only vehicle configuration(s) within the base level are vehicle configuration(s) which are intended for sale at high altitude, the Administrator may use fuel economy data from tests conducted on these vehicle configuration(s) at high altitude to calculate the fuel economy for the base level.

(7) For alcohol dual fuel automobiles and natural gas dual fuel automobiles, the procedures of paragraphs (a)(1) through (6) of this section shall be used to calculate two separate sets of city, highway, and combined fuel economy values for each base level.

(i) Calculate the city and highway fuel economy values from the tests performed using gasoline or diesel test fuel.

(ii) If 5-cycle testing was performed on the alcohol or natural gas test fuel, calculate the city and highway fuel economy values from the tests performed using alcohol or natural gas test fuel.

(b) *Model type.* For each model type, as determined by the Administrator, a city and highway fuel economy value will be calculated by using the projected sales and fuel economy values for each base level within the model type. Separate model type calculations will be done based on the vehicle configuration fuel economy values as determined in § 600.207–08, as applicable.

(1) If the Administrator determines that automobiles intended for sale in the State of California are likely to exhibit significant differences in fuel economy from those intended for sale in other states, he will calculate fuel economy values for each model type for vehicles intended for sale in California and for each model type for vehicles intended for sale in the rest of the states.

(2) The sales fraction for each base level is calculated by dividing the projected sales of the base level within the model type by the projected sales of the model type and rounding the quotient to the nearest 0.0001.

(3) The 5-cycle city fuel economy values of the model type (calculated to the nearest 0.0001 mpg) are determined by dividing one by a sum of terms, each of which corresponds to a base level and which is a fraction determined by dividing:

(i) The sales fraction of a base level; by

(ii) The 5-cycle city fuel economy value for the respective base level.

(4) The procedure specified in paragraph (b)(3) of this section is repeated in an analogous manner to determine the highway and combined fuel economy values for the model type.

(5) For alcohol dual fuel automobiles and natural gas dual fuel automobiles the procedures of paragraphs (b)(1) through (4) of this section shall be used to calculate two separate sets of city and highway fuel economy values for each model type.

(i) Calculate the city and highway fuel economy values from the tests performed using gasoline or diesel test fuel.

(ii) Calculate the city, highway, and combined fuel economy values from the tests performed using alcohol or natural gas test fuel, if 5-cycle testing was performed on the alcohol or natural gas test fuel. Otherwise, the procedure in § 600.210(a)(3) or (b)(3) applies.

■ 38. A new § 600.210–08 is added to read as follows:

§ 600.210–08 Calculation of fuel economy values for labeling.

(a) *General labels.* Fuel economy for general labels can be determined by two methods. The first is based on vehicle-specific model-type 5-cycle data as determined in § 600.209–08(b). This method is optional beginning in the 2008 model year for all vehicles, including medium-duty passenger vehicles, and required beginning in the 2011 model year (except for medium-duty passenger vehicles) unless otherwise indicated according to the provisions in § 600.115–08. The second method is the derived 5-cycle method, and is based on fuel economy that is derived from vehicle-specific 5-cycle

model type data as determined in paragraph (a)(2) of this section. This method is required for 2008 through 2010 model years (except for medium-duty passenger vehicles, in which case it is optional), and is permitted beginning in 2011 model year under the provisions of § 600.115–08. If the manufacturer determines that the resulting label values from either of these methods are not representative of the fuel economy for that model type, they may voluntarily lower these values. All 2011 and later model year medium-duty passenger vehicles must be labeled for fuel economy, using the derived 5-cycle method or, at the manufacturer's option, the vehicle-specific 5-cycle method. Fuel economy label values for dual fuel vehicles operating on alcohol-based or natural gas fuel are calculated separately.

(1) *Vehicle-specific 5-cycle labels.* The city and highway model type fuel economy determined in § 600.209–08(b), rounded to the nearest mpg, comprise the fuel economy values for general fuel economy labels, or, alternatively;

(2) *Derived 5-cycle labels.* Derived 5-cycle city and highway label values are determined according to the following method:

(i) For each model type, determine the derived five-cycle city fuel economy using the following equation and coefficients determined by the Administrator:

$$\text{Derived 5-cycle City Fuel Economy} = \frac{1}{\left(\{\text{City Intercept}\} + \frac{\{\text{City Slope}\}}{\text{MTFTP FE}}\right)}$$

Where:

City Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

City Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

MT FTP FE = the model type FTP-based city fuel economy determined under § 600.208–08(a), rounded to the nearest tenth.

(ii) For each model type, determine the derived five-cycle highway fuel economy using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle Highway Fuel Economy} = \frac{1}{\left(\{\text{Highway Intercept}\} + \frac{\{\text{Highway Slope}\}}{\text{MT HFET FE}}\right)}$$

Where:

Highway Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Highway Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

MT HFET FE = the model type highway fuel economy determined under § 600.208–08(b), rounded to the nearest tenth.

(iii) For 2008 and later model year vehicles, unless and until superseded by written guidance from the Administrator, the following intercepts and slopes shall be used in the equations in paragraphs (a)(2)(i) and (a)(2)(ii) of this section:

City Intercept = 0.003259.
City Slope = 1.1805.
Highway Intercept = 0.001376.
Highway Slope = 1.3466.

The Administrator will periodically update the slopes and intercepts via guidance and will determine the model year that the new coefficients must take effect. The Administrator will issue guidance no later than six months prior to the earliest starting date of the effective model year (e.g., for 2011 models, the earliest start of the model year is January 2, 2010, so guidance would be issued by July 1, 2009.) Until otherwise instructed by written guidance from the Administrator, manufacturers must use the coefficients that are in currently in effect.

(3) *General alternate fuel label values for dual-fueled vehicles.* (i) City and Highway label values for dual fuel alcohol-based and natural gas vehicles when using the alternate fuel are separately determined by the following calculation:

$$\text{Derived FE}_{\text{alt}} = \text{FE}_{\text{alt}} \times \frac{\text{5 cycle}_{\text{gas}}}{\text{FE}_{\text{gas}}}$$

Where:

FE_{alt} = The unrounded FTP-based model-type city or HFET-based model-type highway fuel economy from the alternate fuel, as determined in § 600.208(b)(5)(ii).

5cycle FE_{gas} = The unrounded vehicle-specific or derived 5-cycle model-type city or highway fuel economy as determined in paragraph (a)(1) or (b)(2) of this section.

FE_{gas} = The unrounded FTP-based city or HFET-based model type highway fuel economy from gasoline (or diesel), as determined in § 600.208(b)(5)(i).

The result, rounded to the nearest whole number, is the alternate fuel label value for dual fuel vehicles.

(ii) Optionally, if complete 5-cycle testing has been performed using the alternate fuel, the manufacturer may choose to use the alternate fuel label city or highway value result in § 600.209–08(b)(5)(ii), rounded to the nearest whole number.

(b) *Specific Labels.* The following two methods are used to determine specific labels. The first is based on vehicle-specific configuration 5-cycle data as determined in § 600.207–08. This method is optional beginning in the 2008 model year for all vehicles, including medium-duty passenger vehicles, and required beginning in the 2011 model year (except for medium-duty passenger vehicles) unless otherwise indicated according to the provisions in § 600.115–08. The second method is based on derived 5-cycle configuration data as determined in paragraph (a)(2) of this section. This method is required for 2008 through 2010 model years (except for medium-duty passenger vehicles, in which case it is optional), and is allowed beginning in 2011 model year if permitted under the provisions in § 600.115–08. If the manufacturer determines that the resulting label values from either of these methods are not representative of the fuel economy for that model type,

they may voluntarily lower these values. All 2011 and later model year medium-duty passenger vehicles must be labeled for fuel economy, using the derived 5-cycle method or, at the manufacturer's option, the vehicle-specific 5-cycle method. Fuel economy label values for dual fuel vehicles operating on alcohol-based or natural gas fuel are calculated separately.

(1) *Vehicle-specific 5-cycle labels.* The city and highway configuration fuel economy determined in § 600.207–08, rounded to the nearest mpg, comprise the fuel economy values for specific fuel economy labels, or, alternatively;

(2) *Derived 5-cycle labels.* Specific city and highway label values from derived 5-cycle are determined according to the following method:

(i) Determine the derived five-cycle city fuel economy of the configuration using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle City Fuel Economy} = \frac{1}{\left(\{\text{City Intercept}\} + \frac{\{\text{City Slope}\}}{\text{Config FTP FE}}\right)}$$

Where:

City Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

City Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

Config FTP FE = the configuration FTP-based city fuel economy determined under § 600.206–08, rounded to the nearest tenth.

(ii) Determine the derived five-cycle highway fuel economy of the configuration using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle Highway Fuel Economy} = \frac{1}{\left(\{\text{Highway Intercept}\} + \frac{\{\text{Highway Slope}\}}{\text{Config HFET FE}}\right)}$$

Where:

Highway Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Highway Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Config HFET FE = the configuration highway fuel economy determined under § 600.206–08, rounded to the nearest tenth.

(iii) The slopes and intercepts of paragraph (a)(2)(iii) of this section apply.

(3) Specific alternate fuel label values for dual-fueled vehicles. (i) Specific city and highway label values for dual fuel alcohol-based and natural gas vehicles when using the alternate fuel are separately determined by the following calculation:

$$\text{Derived FE}_{\text{alt}} = \text{FE}_{\text{alt}} \times \frac{\text{5 cycle}_{\text{gas}}}{\text{FE}_{\text{gas}}}$$

Where:

FE_{alt} = The unrounded FTP-based configuration city or HFET-based configuration highway fuel economy from the alternate fuel, as determined in § 600.206.

5cycle FE_{gas} = The unrounded vehicle-specific or derived 5-cycle configuration city or highway fuel economy as determined in paragraph (b)(1) or (b)(2) of this section.

FE_{gas} = The unrounded FTP-based city or HFET-based configuration highway fuel economy from gasoline, as determined in § 600.206–08.

The result, rounded to the nearest whole number, is the alternate fuel label value for dual fuel vehicles.

(ii) Optionally, if complete 5-cycle testing has been performed using the alternate fuel, the manufacturer may choose to use the alternate fuel label city or highway value result in § 600.207–08(a)(4)(ii), rounded to the nearest whole number.

(c) For the purposes of calculating the combined fuel economy for a model type, to be used in displaying on the label and for determining annual fuel costs under § 600.307–08, the manufacturer shall:

(1)(i) For gasoline-fueled, diesel-fueled, alcohol-fueled, and natural gas-fueled automobiles, and for dual fuel automobiles operated on gasoline or diesel fuel, harmonically average the unrounded city and highway values, determined in paragraphs (a)(1) or (2) of this section and (b)(1) or (2) of this section, weighted 0.55 and 0.45 respectively, and round to the nearest whole mpg. (An example of this calculation procedure appears in Appendix II of this part); or

(ii) For alcohol dual fuel and natural gas dual fuel automobiles operated on the alternate fuel, harmonically average the unrounded city and highway values from the tests performed using the alternative fuel as determined in paragraphs (a)(3) and (b)(3) of this section, weighted 0.55 and 0.45 respectively, and round to the nearest whole mpg.

(d)(1) Label values for 2008–2010 model year automobiles (except medium-duty passenger vehicles) the city and highway values for a model type must be determined by the same method. If the manufacturer optionally chooses to determine fuel economy for a model type using the vehicle-specific 5-cycle method, that method must be used to determine both the city and highway fuel economy.

(2) For 2011 and later model year automobiles, if the criteria in § 600.115–08(a) are met for a model type, both the city and highway fuel economy must be determined using the vehicle-specific 5-cycle method. If the criteria in § 600.115–08(b) are met for a model type, the city fuel economy may be determined using either method, but the highway fuel economy must be determined using the vehicle-specific 5-cycle method (or modified 5-cycle method as allowed under § 600.114–08(b)(2)).

(3) If the criteria in § 600.115–08 are not met for a model type, the city and highway label values must be determined by using the same method, either the derived 5-cycle or vehicle-specific 5-cycle.

■ 39. A new § 600.211–08 is added to read as follows:

§ 600.211–08 Sample Calculation of fuel economy values for labeling.

An example of the calculation required in this subpart appears in Appendix III of this part.

Subpart D—[Amended]

■ 40. A new § 600.301–08 is added to read as follows:

§ 600.301–08 General applicability.

(a) Unless otherwise specified, the provisions of this subpart are applicable to 2008 and later model year automobiles, except medium duty passenger vehicles, manufactured on or after January 26, 2007, and to 2011 and later model year medium-duty passenger vehicles. All 2008 automobiles manufactured prior to January 26, 2007 may optionally comply with the provisions of this subpart.

(b)(1) Manufacturers that produce only electric vehicles are exempt from the requirement of this subpart, except with regard to the requirements in those sections pertaining specifically to electric vehicles.

(2) Manufacturers with worldwide production (excluding electric vehicle production) of less than 10,000 gasoline-fueled and/or diesel powered passenger automobiles and light trucks may optionally comply with the electric vehicle requirements in this subpart.

■ 41. A new § 600.306–08 is added to read as follows:

§ 600.306–08 Labeling requirements.

(a) Prior to being offered for sale, each manufacturer shall affix or cause to be affixed and each dealer shall maintain or cause to be maintained on each automobile:

(1) A general fuel economy label (initial, or updated as required in § 600.314–08) as described in § 600.307–08 or:

(2) A specific label, for those automobiles manufactured or imported before the date that occurs 15 days after general labels have been determined by the manufacturer, as described in § 600.210–08(b).

(i) If the manufacturer elects to use a specific label within a model type (as defined in § 600.002–08, he shall also affix specific labels on all automobiles within this model type, except on those automobiles manufactured or imported before the date that labels are required to bear range values as required by paragraph (b) of this section, or determined by the Administrator, or as permitted under § 600.310–86.

(ii) If a manufacturer elects to change from general to specific labels or vice versa within a model type, the manufacturer shall, within five calendar days, initiate or discontinue as applicable, the use of specific labels on all vehicles within a model type at all facilities where labels are affixed.

(3) For any vehicle for which a specific label is requested which has a combined FTP/HFET-based fuel economy value, as determined in § 600.513–08, at or below the minimum tax-free value, the following statement must appear on the specific label:

''[Manufacturer's name] may have to pay IRS a Gas Guzzler Tax on this vehicle because of the low fuel economy.''

(4)(i) At the time a general fuel economy value is determined for a model type, a manufacturer shall, except as provided in paragraph (a)(4)(ii) of this section, relabel, or cause to be relabeled, vehicles which:

(A) Have not been delivered to the ultimate purchaser, and

(B) Have a combined FTP/HFET-based model type fuel economy value (as determined in § 600.208–08(b) of 0.1 mpg or more below the lowest fuel economy value at which a Gas Guzzler Tax of $0 is to be assessed.

(ii) The manufacturer has the option of re-labeling vehicles during the first five working days after the general label value is known.

(iii) For those vehicle model types which have been issued a specific label and are subsequently found to have tax liability, the manufacturer is responsible for the tax liability regardless of whether the vehicle has been sold or not or whether the vehicle has been relabeled or not.

(b) *Fuel economy range of comparable vehicles.* The manufacturer shall include the current range of fuel economy of comparable automobiles (as described in §§ 600.311–08 and 600.314–08) in the label of each vehicle manufactured or imported more than 15 calendar days after the current range is made available by the Administrator.

(1) Automobiles manufactured or imported before a date 16 or more calendar days after the initial label range is made available under § 600.311–08(c) shall include the range from the previous model year.

(2) Automobiles manufactured or imported more than 15 calendar days after the label range is made available under § 600.311–08(c) or (d) shall be labeled with the current range of fuel economy of comparable automobiles as approved for that label.

(c) The fuel economy label must be readily visible from the exterior of the automobile and remain affixed until the time the automobile is delivered to the ultimate consumer.

(1) It is preferable that the fuel economy label information be incorporated into the Automobile Information Disclosure Act label, provided that the prominence and legibility of the fuel economy label is maintained. For this purpose, all fuel economy label information must be placed on a separate section in the Automobile Information Disclosure Act label and may not be intermixed with that label information, except for vehicle descriptions as noted in § 600.307–08(d)(1).

(2) The fuel economy label must be located on a side window. If the window is not large enough to contain both the Automobile Information Disclosure Act label and the fuel economy label, the manufacturer shall have the fuel economy label affixed on another window and as close as possible to the Automobile Information Disclosure Act label.

(3) The manufacturer shall have the fuel economy label affixed in such a manner that appearance and legibility are maintained until after the vehicle is delivered to the ultimate consumer.

■ 42. A new § 600.307–08 is added to read as follows:

§ 600.307–08 Fuel economy label format requirements.

Examples of fuel economy labels for gasoline and diesel vehicles, dual fuel vehicles and alternate fuel vehicles are provided in Appendix IV of this part. Detailed printing specifications are given in Appendix V of this part, and unless otherwise permitted, apply to the provisions in this section. The Administrator may approve modifications to the style guidelines in cases where there may be space limitations and/or legibility concerns.

(a) Fuel economy labels must be:

(1) Rectangular in shape with a minimum height of 4.5 inches (114 mm) and a minimum length of 7.0 inches (178 mm) as specified in Appendix V of this part.

(2) Printed in a color which contrasts with the background paper color.

(3) Have a contrasting border, with dimensions specified in Appendix V of this part.

(b) *Label information.* The information on the label shall contain:

(1) The titles ''CITY MPG'' and ''HIGHWAY MPG'', centered over the applicable fuel economy estimates.

(2) The numeric, whole-number city and highway estimates, as determined in § 600.210–08, as specified in Appendix V of this part. The font size

of the numbers may be larger than specified, provided: that the city and highway numbers are equal in size; that the titles ''CITY MPG'' and ''HIGHWAY MPG'' are increased in the same proportion; and that doing so does not obscure the other information on the label.

(i) For dedicated gasoline-fueled, diesel-fueled, alcohol-fueled, and natural gas-fueled automobiles, the city and highway fuel economy estimates calculated in accordance with § 600.210–08.

(ii) For alcohol dual fuel automobiles and natural gas dual fuel automobiles, the city and highway fuel economy estimates for operation on gasoline or diesel fuel as calculated in § 600.210–08(a) and (b).

(3) The fuel pump logo.

(4) The following phrase: ''Your actual mileage will vary depending on how you drive and maintain your vehicle.'', located and formatted as shown in Appendix V of this part.

(5) The statement: ''Expected range for most drivers: ____ to ____ mpg'', placed underneath both the city and highway estimates, centered to the estimate numbers. The range values for this statement are to be calculated in accordance with the following:

(i) The lower range values shall be determined by multiplying the city and highway estimates by 0.83, then rounding to the next lower integer value.

(ii) The upper range values shall be determined by multiplying the city and highway estimates by 1.17 and rounding to the next higher integer value.

(6) The top border shall contain the centered title ''EPA Fuel Economy Estimates'' in a contrasting color.

(7) *Alternate fuel titles.* (i) For dedicated alcohol-fueled automobiles, the title ''[insert appropriate fuel (e.g., ''ETHANOL (E85))''] *''. The title shall be positioned and sized according to the style guidelines in Appendix V of this part.

(ii) For dedicated natural gas-fueled automobiles, the title ''NATURAL GAS *''. The title shall be positioned in the grey area above the window of the fuel pump logo, in a size and format specified in Appendix V of this part.

(iii) For alcohol-based dual fuel automobiles and natural gas dual fuel automobiles, the title ''Dual Fuel Vehicle*'', and directly below that, the title ''[insert appropriate conventional fuel (example Gasoline)]-[insert appropriate alternate fuel (example ''Ethanol (E85)'']''. Both of these titles are centered in the grey area above the window of the fuel pump logo, with a size and format specified in Appendix V of this part.

(8) *Alternate fuel information.* (i) For dedicated alcohol-fueled automobiles, the title ''[insert appropriate fuel (example ''E85'')]'' centered above the title ''CITY MPG'' and above the title ''HIGHWAY MPG'' with a size and format specified in Appendix V of this part.

(ii) For dedicated natural gas-fueled automobile, the title ''GASOLINE EQUIVALENT'' centered above the title ''CITY MPG'' and above the title ''HIGHWAY MPG'' with a size and format specified in Appendix V of this part.

(iii) For alcohol dual fuel automobiles and natural gas dual fuel automobiles, the title ''GASOLINE'' [or ''DIESEL'', as applicable] centered above the title ''CITY MPG'' and above the title ''HIGHWAY MPG'' with a size and format specified in Appendix V of this part.

(9) The bottom border of the label shall contain the following centered statement, formatted according to the style guidelines in Appendix V: ''See the FREE Fuel Economy Guide at dealers or *www.fueleconomy.gov*''.

(10) If the label is separate from the Automobile Information Disclosure Act label, the vehicle description, as described in paragraph (d) of this section, located on the label such that it does not interfere with the other required information. In cases where the vehicle description information may not easily fit on the label, the manufacturer may request Administrator approval of modifications to the label format to accommodate this information.

(11) *Comparison fuel economy.* A graphic depiction of comparison fuel economy information, in the style and format given in Appendix V of this part, containing the following elements:

(i) A bar that represents the total range of combined fuel economy for the applicable class of comparison fuel economy.

(ii) A downward pointing tail-less arrow, located at the top of the bar positioned on the bar where that vehicle's combined fuel economy falls relative to the range of comparable vehicles.

(iii) The combined fuel economy value for the vehicle as determined in § 600.210–08(c), located directly above the arrow.

(iv) The statement ''This Vehicle'' directly above the combined fuel economy number.

(vi)(A) For gasoline and diesel fuel vehicles, the statement ''Combined Fuel Economy'', located above the ''This Vehicle'' statement, and centered above the bar.

(B) For dual fuel vehicles, the statement ''Combined Gasoline [or ''Diesel'', as appropriate] Fuel Economy'', located above the ''This Vehicle'' statement, and centered above the bar, in two lines, if needed.

(C) For dedicated natural gas vehicles, the statement ''Combined Gasoline Equivalent Fuel Economy'', located above the ''This Vehicle'' statement, and centered above the bar, in two lines, if needed.

(v) The upper and lower MPG ranges for that class of vehicles, with the lower range shown directly to the left of the bar and the upper range directly to the right of the bar. The range values are those determined in accordance with § 600.311.

(vi) The statement ''All [name of the comparable vehicle class]s'', centered below the bar. The names of the comparable classes given in § 600.315–08 apply. For the purpose of presenting the name of the class on the label, the following class names may be shortened as indicated: minicompact cars may be ''Minicompacts'', subcompact cars may be ''Subcompacts'', compact cars may be ''Compacts'', small station wagons may be ''Small Wagons'', midsize station wagons may be ''Midsize Wagons'', large station wagons may be ''Large Wagons'', small pickup trucks may be ''Small Pickups'', standard pickup trucks may be ''Standard Pickups'', and sport utility vehicles may be ''SUVs''.

(12)(i) The statement: ''Estimated Annual Fuel Cost:'' followed by the appropriate value calculated in accordance with paragraph (f) or (g) of this section and the statement ''based on [EPA-provided number of miles per paragraph (f) of this section] miles at [the EPA-provided dollar cost per gallon of the required fuel for that vehicle] per gallon of gasoline.'' The estimated annual fuel cost value for alcohol dual fuel automobiles and natural gas dual fuel vehicles to appear on the fuel economy label shall be that calculated based on operating the vehicle on gasoline or diesel fuel as determined in paragraphs (f) and (g) of this section.

(ii) At the manufacturer's option, the label may also contain the estimated annual fuel cost value based on operating the vehicle on the alternative fuel.

(13) The Gas Guzzler statement, when applicable (see paragraph (e) of this section), must be located on the bottom half of the label, either in the space reserved for alternate fuel information, or, if the vehicle is an alternate fuel vehicle, directly beneath this space.

(14) *Alternate fuel statement.* (i) For dedicated alternate fuel automobiles, the statement: ''* This vehicle operates on NATURAL GAS FUEL [or other alternate fuel as appropriate] only. Fuel economy is expressed in gasoline equivalent values.'' This statement is located on the right-hand bottom portion of the label. See Appendix V of this part for details of location, size and format.

(ii) For dual fuel automobiles, the statement: ''*Fuel economy when operating on E85 [or other alternate fuel as appropriate] will yield different values than gasoline [or diesel as appropriate]. See Fuel Economy Guide for more information.'' Optionally, this statement may be replaced with the city, highway and combined fuel economy values using the alternate fuel, in a size and format specified in Appendix V of this part.

(c) The city mpg number shall be displayed on the upper half of the left side of the label and the highway mpg number displayed on the upper half of the right side of the label. If the manufacturer chooses to enlarge the label from that specified in paragraph (a)(1) of this section, the logo and the fuel economy label values, including the titles ''CITY MPG'' and ''HIGHWAY MPG'', must be increased in the same proportion.

(d) Vehicle description information for general and specific labels.

(1) Where the fuel economy label is physically incorporated with the Motor Vehicle Information and Cost Savings Act label, the applicable vehicle description, as set forth in this paragraph, does not have to be repeated if the information is readily found on this label.

(2) For fuel economy labels which are physically separate from the Motor Vehicle Information and Cost Savings Act label, the vehicle description on general labels will be as follows:

(i) Model year;

(ii) Vehicle car line;

(iii) Engine displacement, in cubic inches, cubic centimeters, or liters whichever is consistent with the customary description of that engine;

(iv) Transmission class.

(v) Other descriptive information, as necessary, such as number of engine cylinders, to distinguish otherwise identical model types or, in the case of specific labels, vehicle configurations, as approved by the Administrator.

(e)(1) For fuel economy labels of passenger automobile model types requiring a tax statement under § 600.513–08, the phrase ''Gas Guzzler Tax'' followed by the dollar amount, in a size and format specified in Appendix V of this part.

(2) The tax value required by this paragraph shall be based on the combined fuel economy value for the model type calculated in accordance with § 600.513–08 and rounded to the nearest 0.1 mpg.

(f) *Estimated annual fuel cost—general labels.* The annual fuel cost estimate for operating an automobile included in a model type shall be computed by using values for the fuel cost per gallon of the recommended fuel as specified by the manufacturer in the owner's manual and average annual mileage, predetermined by the Administrator, and the combined fuel economy determined in § 600.210(c).

(1) The annual fuel cost estimate for a model type is computed by multiplying:

(i) Fuel cost per gallon (natural gas must be expressed in units of cost per equivalent gallon, where 100 SCF = 0.823 equivalent gallons) expressed in dollars to the nearest 0.05 dollar; by

(ii) Average annual mileage, expressed in miles per year to the nearest 1,000 miles per year, by

(iii) The inverse of the combined fuel economy value determined in § 600.210–08(c) for a model type (as determined in § 600.210–08(a), rounded to the nearest 0.0001 gallons per mile (natural gas must be expressed in units of gallon equivalent per mile, where 100 SCF=0.823 equivalent gallons).

(2) The product computed in paragraph (f)(1) of this section and rounded to the nearest dollar per year will comprise the annual fuel cost estimate that appears on general labels for the model type.

(g) *Estimated annual fuel cost—specific labels.* (1) The annual fuel cost estimate for operating an automobile included in a vehicle configuration will be computed by using the values for the fuel cost per volume (gallon for liquid fuels, cubic feet for gaseous fuels) and average mileage and the fuel economy determined by multiplying:

(i) Fuel cost per gallon (natural gas must be expressed in units of cost per equivalent gallon, where 100 SCF=0.823 equivalent gallons) expressed in dollars to the nearest 0.05 dollar; by

(ii) Average annual mileage, expressed in miles per year to the nearest 1,000 miles per year, by

(iii) The inverse, rounded to the nearest 0.0001 gallons per mile (natural gas must be expressed in units of gallon equivalent per mile, where 100 SCF=0.823 equivalent gallons) of the combined fuel economy value determined in § 600.210–08(c) for a vehicle configuration (as determined in § 600.210–08(b).

(2) The product computed in paragraph (g)(1) of this section and rounded to the nearest dollar per year will comprise the annual fuel cost estimate that appears on specific labels for that vehicle configuration.

(h) For model year 2008 and 2009 automobiles only, the following statement, located directly above the fuel pump logo, centered in the label: ''These estimates reflect new EPA methods beginning with 2008 models.'' The size and format is specified in Appendix V to this part.

(i) For model year 2008 vehicles manufactured or imported prior to September 1, 2007, manufacturers may optionally use the label format provisions of § 600.307–95. In this case, the following information must be included on the label:

(1) The city and highway estimates, as determined according to the provisions in § 600.210–08.

(2) The statement ''These estimates reflect new EPA methods beginning with 2008 models.'', centered, and located in a prominent position on the label, preferably near the top of the label.

(j) For model year 2008 vehicles manufactured or imported prior to June 1, 2007, the manufacturer may optionally include the city and highway fuel economy determined under the provisions of § 600.209–95, presented in fine print underneath the city and highway mpg numbers from paragraph (c) of this section, in a statement as follows: ''[xx] MPG under old methods''.

(1) The font size may not exceed 8 points and may not be bold.

(2) If the optional provisions of paragraph (i) of this section are selected, the location of the fuel economy estimates allowed under this paragraph (j) may be either:

(i) underneath the large city and highway miles-per-gallon numbers, or

(ii) in a statement at the bottom of the label as follows: ''*Fuel economy under the old methods would be [xx] MPG city and [xx] MPG highway''. The statement required in paragraph (i)(2) must contain an asterisk (*) after the word ''models''.

■ 43. A new § 600.311–08 is added to read as follows:

§ 600.311–08 Range of fuel economy for comparable automobiles.

(a) The Administrator will determine the range of combined fuel economy values for each class of comparable automobiles comprising the maximum and minimum combined fuel economy

values for all general labels as determined in § 600.210–08(c).

(b)(1) The ranges for a model year will be made available on a date specified by the Administrator that closely coincides to the date of the general model introduction for the industry.

(2) If the Administrator has not made available the fuel economy ranges prior to the model introduction, the ranges from the previous model year must be used.

(3) For 2008 model year automobiles manufactured or imported prior to the date specified in § 600.306–08(b), the Administrator will provide initial fuel economy ranges based upon data from 2007 models that have been adjusted in accordance with the derived 5-cycle calculations in § 600.210–08.

(c) If the Administrator determines that automobiles intended for sale in California are likely to exhibit significant differences in fuel economy from those intended for sale in other states, he/she will compute separate ranges of fuel economy values for each class of automobiles for California and for the other states.

(d) For high altitude vehicles determined under § 600.310, both general and specific labels will contain the range of comparable fuel economy computed in this section.

(e) The manufacturer shall include the appropriate range of fuel economy determined by the Administrator in paragraph (b) of this section, on each label affixed to an automobile within the class, except as provided in § 600.306(b)(1).

■ 44. A new § 600.314–08 is added to read as follows:

§ 600.314–01 Updating label values, annual fuel cost, Gas Guzzler Tax, and range of fuel economy for comparable automobiles.

(a) The label values established in § 600.312 shall remain in effect for the model year unless updated in accordance with paragraph (b) of this section.

(b)(1) The manufacturer shall recalculate the model type fuel economy values for any model type containing base levels affected by running changes specified in § 600.507(a).

(2) For separate model types created in § 600.209–08(a)(2), the manufacturer shall recalculate the model type values for any additions or deletions of subconfigurations to the model type. Minimum data requirements specified in § 600.010(c) shall be met prior to recalculation.

(3) Label value recalculations shall be performed as follows:

(i) The manufacturer shall use updated total model year projected sales for label value recalculations.

(ii) All model year data approved by the Administrator at the time of the recalculation for that model type shall be included in the recalculation.

(iii) Using the additional data under paragraph (b) of this section, the manufacturer shall calculate new model type city and highway values in accordance with § 600.210–08 except that the values shall be rounded to the nearest 0.1 mpg.

(iv) The existing label values, calculated in accordance with § 600.210–08, shall be rounded to the nearest 0.1 mpg.

(4)(i) If the recalculated city or highway fuel economy value in paragraph (b)(3)(iii) of this section is less than the respective city or highway value in paragraph (b)(3)(iv) of this section by 1.0 mpg or more, the manufacturer shall affix labels with the recalculated model type values (rounded to the nearest whole mpg) to all new vehicles of that model type beginning on the day of implementation of the running change.

(ii) If the recalculated city or highway fuel economy value in paragraph (b)(3)(iii) of this section is higher than the respective city or highway value in paragraph (b)(3)(iv) of this section by 1.0 mpg or more, then the manufacturer has the option to use the recalculated values for labeling the entire model type beginning on the day of implementation of the running change.

(c) For fuel economy labels updated using recalculated fuel economy values determined in accordance with paragraph (b) of this section, the manufacturer shall concurrently update all other label information (*e.g.*, the annual fuel cost, range of comparable vehicles and the applicability of the Gas Guzzler Tax as needed).

(d) The Administrator shall periodically update the range of fuel economies of comparable automobiles based upon all label data supplied to the Administrator.

(e) The manufacturer may request permission from the Administrator to calculate and use label values based on test data from vehicles which have not completed the Administrator-ordered confirmatory testing required under the provisions of § 600.008–08(b). If the Administrator approves such a calculation the following procedures shall be used to determine if relabeling is required after the confirmatory testing is completed.

(1) The Administrator-ordered confirmatory testing shall be completed as quickly as possible.

(2) Using the additional data under paragraph (e)(1) of this section, the manufacturer shall calculate new model type city and highway values in accordance with §§ 600.207–08 and 600.210–08 except that the values shall be rounded to the nearest 0.1 mpg.

(3) The existing label values, calculated in accordance with § 600.210–08, shall be rounded to the nearest 0.1 mpg.

(4) *Relabeling.* (i) If the recalculated city or highway fuel economy value in paragraph (b)(3)(iii) of this section is less than the respective city or highway value in paragraph (b)(3)(iv) of this section by 0.5 mpg or more, the manufacturer shall affix labels with the recalculated model type values (rounded to whole mpg') to all new vehicles of that model type beginning 15 days after the completion of the confirmatory test.

(ii) If both the recalculated city or highway fuel economy value in paragraph (b)(3)(iii) of this section is less than the respective city or highway value in paragraph (b)(3)(iv) of this section by 0.1 mpg or more and the recalculated gas guzzler tax rate determined under the provisions of § 600.513–08 is larger, the manufacturer shall affix labels with the recalculated model type values (rounded to whole mpg') and gas guzzler tax statement and rates to all new vehicles of that model type beginning 15 days after the completion of the confirmatory test.

(5) For fuel economy labels updated using recalculated fuel economy values determined in accordance with paragraph (e)(4) of this section, the manufacturer shall concurrently update all other label information (*e.g.*, the annual fuel cost, range of comparable vehicles and the applicability of the Gas Guzzler Tax if required by Department of Treasury regulations).

■ 45. A new § 600.315–08 is added to read as follows:

§ 600.315–08 Classes of comparable automobiles.

(a) The Secretary will classify automobiles as passenger automobiles or light trucks (nonpassenger automobiles) in accordance with 49 CFR part 523.

(1) The Administrator will classify passenger automobiles by car line into one of the following classes based on interior volume index or seating capacity except for those passenger automobiles which the Administrator determines are most appropriately placed in a different classification or classed as special purpose vehicles as provided in paragraph (a)(3) of this section.

(i) *Two seaters.* A car line shall be classed as ''Two Seater'' if the majority of the vehicles in that car line have no more than two designated seating positions as such term is defined in the regulations of the National Highway Traffic Safety Administration, Department of Transportation (DOT), 49 CFR 571.3.

(ii) *Minicompact cars.* Interior volume index less than 85 cubic feet.

(iii) *Subcompact cars.* Interior volume index greater than or equal to 85 cubic feet but less than 100 cubic feet.

(iv) *Compact cars.* Interior volume index greater than or equal to 100 cubic feet but less than 110 cubic feet.

(v) *Midsize cars.* Interior volume index greater than or equal to 110 cubic feet but less than 120 cubic feet.

(vi) *Large cars.* Interior volume index greater than or equal to 120 cubic feet.

(vii) *Small station wagons.* Station wagons with interior volume index less than 130 cubic feet.

(viii) *Midsize station wagons.* Station wagons with interior volume index greater than or equal to 130 cubic feet but less than 160 cubic feet.

(ix) *Large station wagons.* Station wagons with interior volume index greater than or equal to 160 cubic feet.

(2) The Administrator will classify light trucks (nonpassenger automobiles) into the following categories: small pickup trucks, standard pickup trucks, vans, minivans, SUVS and special purpose vehicles. Pickup trucks will be separated by car line on the basis of gross vehicle weight rating (GVWR). For pickup truck car lines with more than one GVWR, the GVWR of the pickup truck car line is the arithmetic average of all distinct GVWR's less than or equal to 8,500 pounds available for that car line.

(i) *Small pickup trucks.* Pickup trucks with a GVWR less than 6000 pounds.

(ii) *Standard pickup trucks.* Pickup trucks with a GVWR of 6000 pounds up to and including 8,500 pounds.

(iii) *Vans.*

(iv) *Minivans.*

(v) *Sport utility vehicles.*

(3) (i) *Special purpose vehicles.* All automobiles with GVWR less than or equal to 8,500 pounds and all medium-duty passenger vehicles which possess special features and which the Administrator determines are more appropriately classified separately from typical automobiles or which do not meet the requirements of paragraphs (a)(1) and (2) of this section will be classified as special purpose vehicles.

(ii) All automobiles which possess features that could apply to two classes will be classified by the Administrator based on the Administrator's judgment on which class of vehicles consumers are more likely to make comparisons.

(4) Once a certain car line is classified by the Administrator, the classification will remain in effect for the model year.

(b) *Interior volume index—passenger automobiles.* (1) The interior volume index shall be calculated for each car line which is not a ''Atwo seater'' car line, in cubic feet rounded to the nearest 0.1 cubic foot. For car lines with more than one body style, the interior volume index for the car line is the arithmetic average of the interior volume indexes of each body style in the car line.

(2) For all body styles except station wagons, minivans and hatchbacks with more than one seat (*e.g.*, with a second or third seat) equipped with seatbelts as required by DOT safety regulations, interior volume index is the sum, rounded to the nearest 0.1 cubic feet, of the front seat volume, the rear seat volume, if applicable, and the luggage capacity.

(3) For all station wagons, minivans and hatchbacks with more than one seat (*e.g.*, with a second or third seat) equipped with seatbelts as required by DOT safety regulations, interior volume index is the sum, rounded to the nearest 0.1 cubic feet, of the front seat volume, the rear seat volume, and the cargo volume index.

(c) All interior and cargo dimensions are measured in inches to the nearest 0.1 inch. All dimensions and volumes shall be determined from the base vehicles of each body style in each car line, and do not include optional equipment. The dimensions H61, W3, W5, L34, H63, W4, W6, L51, H201, L205, L210, L211, H198, and volume V1 are to be determined in accordance with the procedures outlined in Motor Vehicle Dimensions SAE J1100a (Report of Human Factors Engineering Committee, Society of Automotive Engineers, approved September 1973 and last revised September 1975) except as noted herein:

(1) *SAE J1100a(2.3)—Cargo dimensions.* All dimensions measured with the front seat positioned the same as for the interior dimensions and the second seat, for the station wagons, minivans and hatchbacks, in the upright position. All head restraints shall be in the stowed position and considered part of the seat.

(2) *SAE J1100a(8)—Luggage capacity.* Total of columns of individual pieces of standard luggage set plus H boxes stowed in the luggage compartment in accordance with the procedure described in 8.2. For passenger automobiles with no rear seat or with two rear seats with no rear seatbelts, the luggage compartment shall include the area to the rear of the front seat, with the rear seat (if applicable) folded, to the height of a horizontal plane tangent to the top of the front seatback.

(3) *SAE J1100a(7)—Cargo dimensions.* (i) L210-Cargo length at second seatback height-hatchback. The minimum horizontal dimension from the ''X'' plane tangent to the rearmost surface of the second seatback to the inside limiting interference of the hatchback door on the zero ''Y'' plane.

(ii) *L211—Cargo length at floor-second-hatchback.* The minimum horizontal dimensions at floor level from the rear of the second seatback to the normal limiting interference of the hatchback door on the vehicle zero ''Y'' plane.

(iii) *H198—Second seatback to load floor height.* The dimension measured vertically from the horizontal tangent to the top of the second seatback to the undepressed floor covering.

(d) The front seat volume is calculated in cubic feet by dividing 1,728 into the product of three terms listed below and rounding the quotient to the nearest 0.001 cubic feet:

(1) *H61—Effective head room-front.* (In inches, obtained according to paragraph (c) of this section),

(2)(i) (W3+W5+5)/2-Average of shoulder and hip room-front, if hip room is more than 5 inches less than shoulder room. (In inches, W3 and W5 are obtained according to paragraph (c) of this section), or

(ii) W3-Shoulder room-front, if hip room is not more than 5 inches less than shoulder room. (In inches, W3 is obtained according to paragraph (c) of this section), and

(3) *L34—Maximum effective leg room-accelerator.* (In inches, obtained according to paragraph (c) of this section.) Round the quotient to the nearest 0.001 cubic feet.

(e) The rear seat volume is calculated in cubic feet, for vehicles within a rear seat equipped with rear seat belts (as required by DOT), by dividing 1,728 into the product of three terms listed below and rounding the quotient to the nearest 0.001 cubic feet:

(1) *H63—Effective head room-second.* (Inches obtained according to paragraph (c) of this section),

(2)(i) (W4+W6+5)/2-Average of shoulder and hip room-second, if hip room is more than 5 inches less than shoulder room. (In inches, W4 and W6 are obtained according to paragraph (c) of this section), or

(ii) W4—Shoulder room-second, if hip room is not more than 5 inches less than shoulder room. (In inches, W3 is obtained according to paragraph (c) of this section), and

(3) *L51—Minimum effective leg room-second.* (In inches obtained according to paragraph (c) of this section.)

(f) The luggage capacity is V1, the usable luggage capacity obtained according to paragraph (c) of this section. For passenger automobiles with no rear seat or with a rear seat but no rear seat belts, the area to the rear of the front seat shall be included in the determination of V1, usable luggage capacity, as outlined in paragraph (c) of this section.

(g) *Cargo volume index.* (1) For station wagons and minivans the cargo volume index V2 is calculated, in cubic feet, by dividing 1,728 into the product of three terms and rounding the quotient to the nearest 0.001 cubic feet:

(i) *W4–;Shoulder room-second.* (In inches obtained according to paragraph (c) of this section.)

(ii) *H201–;Cargo height.* (In inches obtained according to paragraph (c) of this section.)

(iii) *L205–;Cargo length at belt-second.* (In inches obtained according to paragraph (c) of this section.)

(2) For hatchbacks, the cargo volume index V3 is calculated, in cubic feet, by dividing 1,728 into the product of three terms:

(i) Average cargo length, which is the arithmetic average of:

(A) L210–Cargo length at second seatback height-hatchback. (In inches obtained according to paragraph (c) of this section);

(B) L211–;Cargo length at floor-second-hatchback. (In inches obtained according to paragraph (c) of this section);

(ii) W4–;Shoulder room-second. (In inches obtained according to paragraph (c) of this section);

(iii) H198–;Second seatback to load floor height. (In inches obtained according to paragraph (c) of this section.) Round the quotient to the nearest 0.001 cubic foot.

(h) The following data must be submitted to the Administrator no later than the time of a general label request. Data shall be included for each body style in the car line covered by that general label.

(1) For all passenger automobiles:

(i) Dimensions H61, W3, L34 determined in accordance with paragraph (c) of this section.

(ii) Front seat volume determined in accordance with paragraph (d) of this section.

(iii) Dimensions H63, W4, L51 (if applicable) determined in accordance with paragraph (c) of this section.

(iv) Rear seat volume (if applicable) determined in accordance with paragraph (e) of this section.

(v) The interior volume index determined in accordance with paragraph (b) of this section for:

(A) Each body style, and

(B) The car line.

(vi) The class of the car line as determined in paragraph (a) of this section.

(2) For all passenger automobiles except station wagons, minivans and hatchbacks with more than one seat (*e.g.*, with a second or third seat) equipped with seat belts as required by DOT safety regulations:

(i) The quantity and letter designation of the pieces of the standard luggage set installed in the vehicle in the determination of usable luggage capacity V1, and

(ii) The usable luggage capacity V1, determined in accordance with paragraph (f) of this section.

(3) For station wagons and minivans with more than one seat (*e.g.*, with a second or third seat) equipped with seat belts as required by DOT safety regulations:

(i) The dimensions H201 and L205 determined in accordance with paragraph (c) of this section, and

(ii) The cargo volume index V2 determined in accordance with paragraph (g)(1) of this section.

(4) For hatchbacks with more than one seat (*e.g.*, with a second or third seat) equipped with seat belts as required by DOT safety regulations:

(i) The dimensions L210, L211, and H198 determined in accordance with paragraph (c) of this section.

(ii) The cargo volume index V3 determined in accordance with paragraph (g)(2) of this section.

(5) For pickup trucks:

(i) All GVWR's of less than or equal to 8,500 pounds available in the car line.

(ii) The arithmetic average GVWR for the car line.

Subpart E—[Amended]

■ 46. A new § 600.405–08 is added to read as follows:

§ 600.405–08 Dealer requirements.

(a) Each dealer shall prominently display at each location where new automobiles are offered for sale a copy of the annual Fuel Economy Guide containing the information specified in § 600.407. The Fuel Economy Guide may be made available either in hard copy or electronically via an on-site computer available for prospective purchasers to view and print as desired. The dealer shall provide this information without charge. The dealer will be expected to make this information available as soon as it is received by the dealer, but in no case later than 15 working days after notification is given of its availability. The Department of Energy will annually notify dealers of the availability of the information with instructions on how to obtain it either electronically or in hard copy.

(b) The dealer shall display the Fuel Economy Guide, or a notice of where the customer can electronically access the Fuel Economy Guide, in the same manner and in each location used to display brochures describing the automobiles offered for sale by the dealer. The notice shall include a link to the official Web site where this information is contained (*http://www.fueleconomy.gov.*)

(c) The dealer shall display the booklet applicable to each model year automobile offered for sale at the location.

■ 47. A new § 600.407–08 is added to read as follows:

§ 600.407–08 Booklets displayed by dealers.

(a) Booklets displayed by dealers in order to fulfill the obligations of § 600.405 may be either

(1) The printed copy of the annual Fuel Economy Guide published by the Department of Energy, or;

(2) Optionally, dealers may display the Fuel Economy Guide on a computer that is linked to the electronic version of the Fuel Economy Guide (available at *http://www.fueleconomy.gov*), or;

(3) A booklet approved by the Administrator of EPA containing the same information, format, and order as the Fuel Economy Guide published by the Department of Energy. Such a booklet may highlight the dealer's product line by contrasting color of ink or boldface type and may include other supplemental information regarding the dealer's product line subject to approval by the Administrator.

(b) A manufacturer's name and logo or a dealer's name and address or both may appear on the back cover of the hard copies of the Fuel Economy Guide.

Subpart F—[Amended]

48. A new § 600.507–08 is added to read as follows:

§ 600.507–08 Running change data requirements.

(a) Except as specified in paragraph (d) of this section, the manufacturer shall submit additional running change fuel economy data as specified in paragraph (b) of this section for any running change approved or implemented under §§ 86.079–32,

86.079–33, or 86.082–34 or 86.1842–01 as applicable, which:

(1) Creates a new base level or,

(2) Affects an existing base level by:

(i) Adding an axle ratio which is at least 10 percent larger (or, optionally, 10 percent smaller) than the largest axle ratio tested.

(ii) Increasing (or, optionally, decreasing) the road-load horsepower for a subconfiguration by 10 percent or more for the individual running change or, when considered cumulatively, since original certification (for each cumulative 10 percent increase using the originally certified road-load horsepower as a base).

(iii) Adding a new subconfiguration by increasing (or, optionally, decreasing) the equivalent test weight for any previously tested subconfiguration in the base level.

(b)(1) The additional running change fuel economy data requirement in paragraph (a) of this section will be determined based on the sales of the vehicle configurations in the created or affected base level(s) as updated at the time of running change approval.

(2) Within each newly created base level as specified in paragraph (a)(1) of this section, the manufacturer shall submit data from the highest projected total model year sales subconfiguration within the highest projected total model year sales configuration in the base level.

(3) Within each base level affected by a running change as specified in paragraph (a)(2) of this section, fuel economy data shall be submitted for the vehicle configuration created or affected by the running change which has the highest total model year sales. The test vehicle shall be of the subconfiguration created by the running change which has the highest projected total model year sales within the applicable vehicle configuration.

(c) The manufacturer shall submit the fuel economy data required by this section to the Administrator in accordance with § 600.314(b).

(d) For those model types created under § 600.208–08(a)(2), the manufacturer shall submit data for each subconfiguration added by a running change.

■ 49. A new § 600.510–08 is added to read as follows:

§ 600.510–08 Calculation of average fuel economy.

(a) Average fuel economy will be calculated to the nearest 0.1 mpg for the classes of automobiles identified in this section, and the results of such calculations will be reported to the Secretary of Transportation for use in determining compliance with the applicable fuel economy standards.

(1) An average fuel economy calculation will be made for the category of passenger automobiles that is domestically manufactured as defined in § 600.511(d)(1).

(2) An average fuel economy calculation will be made for the category of passenger automobiles that is not domestically manufactured as defined in § 600.511(d)(2).

(3) An average fuel economy calculation will be made for the category of light trucks that is domestically manufactured as defined in § 600.511(e)(1).

(4) An average fuel economy calculation will be made for the category of light trucks that is not domestically manufactured as defined in § 600.511(e)(2).

(b) For the purpose of calculating average fuel economy under paragraph (c), of this section:

(1) All fuel economy data submitted in accordance with § 600.006(e) or § 600.512(c) shall be used.

(2) The combined city/highway fuel economy will be calculated for each model type in accordance with § 600.208–08 of this section except that:

(i) Separate fuel economy values will be calculated for model types and base levels associated with car lines that are:

(A) Domestically produced; and

(B) Nondomestically produced and imported;

(ii) Total model year production data, as required by this subpart, will be used instead of sales projections;

(iii) The fuel economy value of diesel-powered model types will be multiplied by the factor 1.0 to correct gallons of diesel fuel to equivalent gallons of gasoline;

(iv) The fuel economy value will be rounded to the nearest 0.1 mpg; and

(v) At the manufacturer's option, those vehicle configurations that are self-compensating to altitude changes may be separated by sales into high-altitude sales categories and low-altitude sales categories. These separate sales categories may then be treated (only for the purpose of this section) as separate configurations in accordance with the procedure of § 600.208–08(a)(4)(ii).

(3) The fuel economy value for each vehicle configuration is the combined fuel economy calculated according to § 600.206–08(a)(3) except that:

(i) Separate fuel economy values will be calculated for vehicle configurations associated with car lines that are:

(A) Domestically produced; and

(B) Nondomestically produced and imported;

(ii) Total model year production data, as required by this subpart will be used instead of sales projections; and

(iii) The fuel economy value of diesel-powered model types will be multiplied by the factor 1.0 to convert gallons of diesel fuel to equivalent gallons of gasoline.

(c) Except as permitted in paragraph (d) of this section, the average fuel economy will be calculated individually for each category identified in paragraph (a) of this section as follows:

(1) Divide the total production volume of that category of automobiles; by

(2) A sum of terms, each of which corresponds to a model type within that category of automobiles and is a fraction determined by dividing:

(i) The number of automobiles of that model type produced by the manufacturer in the model year; by

(ii) For gasoline-fueled and diesel-fueled model types, the fuel economy calculated for that model type in accordance with paragraph (b)(2) of this section; or

(iii) For alcohol-fueled model types, the fuel economy value calculated for that model type in accordance with paragraph (b)(2) of this section divided by 0.15 and rounded to the nearest 0.1 mpg; or

(iv) For natural gas-fueled model types, the fuel economy value calculated for that model type in accordance with paragraph (b)(2) of this section divided by 0.15 and rounded to the nearest 0.1 mpg; or

(v) For alcohol dual fuel model types, for model years 1993 through 2004, the harmonic average of the following two terms; the result rounded to the nearest 0.1 mpg:

(A) The combined model type fuel economy value for operation on gasoline or diesel fuel as determined in § 600.208(b)(5)(i); and

(B) The combined model type fuel economy value for operation on alcohol fuel as determined in § 600.208(b)(5)(ii) divided by 0.15 provided the requirements of § 600.510(g) are met; or

(vi) For natural gas dual fuel model types, for model years 1993 through 2004, the harmonic average of the following two terms; the result rounded to the nearest 0.1 mpg:

(A) The combined model type fuel economy value for operation on gasoline or diesel as determined in § 600.208(b)(5)(i); and

(B) The combined model type fuel economy value for operation on natural gas as determined in § 600.208(b)(5)(ii) divided by 0.15 provided the requirements of paragraph (g) of this section are met.

(d) The Administrator may approve alternative calculation methods if they are part of an approved credit plan under the provisions of 15 U.S.C. 2003.

(e) For passenger categories identified in paragraphs (a)(1) and (2) of this section, the average fuel economy calculated in accordance with paragraph (c) of this section shall be adjusted using the following equation:

$$AFE_{adj} = AFE[((0.55 \text{ x } a \text{ x } c) + (0.45 \times c) + (0.5556 \text{ x } a) + 0.4487) / ((0.55 \text{ x } a) + 0.45)] + IW$$

Where:

AFE_{adj} = Adjusted average combined fuel economy, rounded to the nearest 0.1 mpg.

AFE = Average combined fuel economy as calculated in paragraph (c) of this section, rounded to the nearest 0.0001 mpg.

a = Sales-weight average (rounded to the nearest 0.0001 mpg) of all model type highway fuel economy values (rounded to the nearest 0.1 mpg) divided by the sales-weighted average (rounded to the nearest 0.0001 mpg) of all model type city fuel economy values (rounded to the nearest 0.1 mpg). The quotient shall be rounded to 4 decimal places. These average fuel economies shall be determined using the methodology of paragraph (c) of this section.

c = 0.0022 for the 1986 model year.

c = A constant value, fixed by model year. For 1987, the Administrator will specify the c value after the necessary laboratory humidity and test fuel data become available. For 1988 and later model years, the Administrator will specify the c value after the necessary laboratory humidity and test fuel data become available.

$$IW = (9.2917 \times 10^{-3} \times SF_{3IWC} \times FE_{3IWC}) - (3.5123 \times 10^{-3} \text{ x} \times SF_{4ETW} \times FE_{4IWC}).$$

Note: Any calculated value of IW less than zero shall be set equal to zero.

SF_{3IWC} = The 3000 lb. inertia weight class sales divided by total sales. The quotient shall be rounded to 4 decimal places.

SF_{4ETW} = The 4000 lb. equivalent test weight category sales divided by total sales. The quotient shall be rounded to 4 decimal places.

FE_{4IWC} = The sales-weighted average combined fuel economy of all 3000 lb. inertia weight class base levels in the compliance category. Round the result to the nearest 0.0001 mpg.

FE_{4IWC} = The sales-weighted average combined fuel economy of all 4000 lb. inertia weight class base levels in the compliance category. Round the result to the nearest 0.0001 mpg.

(f) The Administrator shall calculate and apply additional average fuel economy adjustments if, after notice and opportunity for comment, the Administrator determines that, as a result of test procedure changes not previously considered, such correction is necessary to yield fuel economy test results that are comparable to those obtained under the 1975 test procedures. In making such determinations, the Administrator must find that:

(1) A directional change in measured fuel economy of an average vehicle can be predicted from a revision to the test procedures;

(2) The magnitude of the change in measured fuel economy for any vehicle or fleet of vehicles caused by a revision to the test procedures is quantifiable from theoretical calculations or best available test data;

(3) The impact of a change on average fuel economy is not due to eliminating the ability of manufacturers to take advantage of flexibility within the existing test procedures to gain measured improvements in fuel economy which are not the result of actual improvements in the fuel economy of production vehicles;

(4) The impact of a change on average fuel economy is not solely due to a greater ability of manufacturers to reflect in average fuel economy those design changes expected to have comparable effects on in-use fuel economy;

(5) The test procedure change is required by EPA or is a change initiated by EPA in its laboratory and is not a change implemented solely by a manufacturer in its own laboratory.

(g)(1) Alcohol dual fuel automobiles and natural gas dual fuel automobiles must provide equal or greater energy efficiency while operating on alcohol or natural gas as while operating on gasoline or diesel fuel to obtain the CAFE credit determined in paragraphs (c)(2)(v) and (vi) of this section. The following equation must hold true:

$$E_{alt}/E_{pet} > \text{or} = 1$$

Where:

$E_{alt} = [FE_{alt}/(NHV_{alt} \times D_{alt})] \times 10^6$ = energy efficiency while operating on alternative fuel rounded to the nearest 0.01 miles/million BTU.

$E_{pet} = [FE_{pet}/(NHV_{pet} \times D_{pet})] \times 10^6$ = energy efficiency while operating on gasoline or diesel (petroleum) fuel rounded to the nearest 0.01 miles/million BTU.

FE_{alt} is the fuel economy [miles/gallon for liquid fuels or miles/100 standard cubic feet for gaseous fuels] while operated on the alternative fuel as determined in § 600.113–08(a) and (b);

FE_{pet} is the fuel economy [miles/gallon] while operated on petroleum fuel (gasoline or diesel) as determined in § 600.113(a) and (b);

NHV_{alt} is the net (lower) heating value [BTU/lb] of the alternative fuel;

NHV_{pet} is the net (lower) heating value [BTU/lb] of the petroleum fuel;

D_{alt} is the density [lb/gallon for liquid fuels or lb/100 standard cubic feet for gaseous fuels] of the alternative fuel;

D_{pet} is the density [lb/gallon] of the petroleum fuel.

(i) The equation must hold true for both the FTP city and HFET highway fuel economy values for each test of each test vehicle.

(ii)(A) The net heating value for alcohol fuels shall be determined per ASTM D 240–92 ''Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter.'' This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(B) The density for alcohol fuels shall be determined per ASTM D 1298–85 (Reapproved 1990) ''Standard Practice for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method.'' This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959. Copies may be inspected at U.S. EPA Headquarters Library, EPA West Building, Constitution Avenue and 14th Street, NW., Room 3340, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(iii) The net heating value and density of gasoline are to be determined by the manufacturer in accordance with § 600.113(f).

(2) [Reserved]

(3) Alcohol dual fuel passenger automobiles and natural gas dual fuel passenger automobiles manufactured during model years 1993 through 2004 must meet the minimum driving range

requirements established by the Secretary of Transportation (49 CFR part 538) to obtain the CAFE credit determined in paragraphs (c)(2)(v) and (vi) of this section.

(h) For each of the model years 1993 through 2004, and for each category of automobile identified in paragraph (a) of this section, the maximum increase in average fuel economy determined in paragraph (c) of this section attributable to alcohol dual fuel automobiles and natural gas dual fuel automobiles shall be 1.2 miles per gallon or as provided for in paragraph (i) of this section.

(1) The Administrator shall calculate the increase in average fuel economy to determine if the maximum increase provided in paragraph (h) of this section has been reached. The Administrator shall calculate the average fuel economy for each category of automobiles specified in paragraph (a) of this section by subtracting the average fuel economy values calculated in accordance with this section by assuming all alcohol dual fuel and natural gas dual fuel automobiles are operated exclusively on gasoline (or diesel) fuel from the average fuel economy values determined in paragraphs (b)(2)(vi), (b)(2)(vii), and (c) of this section. The difference is limited to the maximum increase specified in paragraph (h) of this section.

(2) [Reserved]

(i) In the event that the Secretary of Transportation lowers the corporate average fuel economy standard applicable to passenger automobiles below 27.5 miles per gallon for any model year during 1993 through 2004, the maximum increase of 1.2 mpg per year specified in paragraph (h) of this section shall be reduced by the amount the standard was lowered, but not reduced below 0.7 mpg per year.

■ 50. A new § 600.512–08 is added to read as follows:

§ 600.512–01 Model year report.

(a) For each model year, the manufacturer shall submit to the Administrator a report, known as the model year report, containing all information necessary for the calculation of the manufacturer's average fuel economy. The results of the manufacturer calculations and summary information of model type fuel economy values which are contained in the average calculation shall be submitted to the Secretary of the Department of Transportation, National Highway and Traffic Safety Administration.

(b)(1) The model year report shall be in writing, signed by the authorized representative of the manufacturer and shall be submitted no later than 90 days after the end of the model year.

(2) The Administrator may waive the requirement that the model year report be submitted no later than 90 days after the end of the model year. Based upon a request by the manufacturer, if the Administrator determines that 90 days is insufficient time for the manufacturer to provide all additional data required as determined in § 600.507, the Administrator shall establish a date by which the model year report must be submitted.

(3) Separate reports shall be submitted for passenger automobiles and light trucks (as identified in § 600.510).

(c) The model year report must include the following information:

(1) All fuel economy data used in the FTP/HFET-based model type calculations under § 600.208–08, and subsequently required by the Administrator in accordance with § 600.507;

(2) All fuel economy data for certification vehicles and for vehicles tested for running changes approved under § 86.1842–01 of this chapter;

(3) Any additional fuel economy data submitted by the manufacturer under § 600.509;

(4) A fuel economy value for each model type of the manufacturer's product line calculated according to § 600.510(b)(2);

(5) The manufacturer's average fuel economy value calculated according to § 600.510(c);

(6) A listing of both domestically and nondomestically produced car lines as determined in § 600.511 and the cost information upon which the determination was made; and

(7) The authenticity and accuracy of production data must be attested to by the corporation, and shall bear the signature of an officer (a corporate executive of at least the rank of vice-president) designated by the corporation. Such attestation shall constitute a representation by the manufacturer that the manufacturer has established reasonable, prudent procedures to ascertain and provide production data that are accurate and authentic in all material respects and that these procedures have been followed by employees of the manufacturer involved in the reporting process. The signature of the designated officer shall constitute a representation by the required attestation.

■ 51. A new § 600.513–08 is added to read as follows:

§ 600.513–08 Gas Guzzler Tax.

(a) This section applies only to passenger automobiles sold after December 27, 1991, regardless of the model year of those vehicles. For alcohol dual fuel and natural gas dual fuel automobiles, the fuel economy while such automobiles are operated on gasoline will be used for Gas Guzzler Tax assessments.

(1) The provisions of this section do not apply to passenger automobiles exempted for Gas Guzzler Tax assessments by applicable federal law and regulations. However, the manufacturer of an exempted passenger automobile may, in its discretion, label such vehicles in accordance with the provisions of this section.

(2) For 1991 and later model year passenger automobiles, the combined FTP/HFET-based model type fuel economy value determined in § 600.208–08 used for Gas Guzzler Tax assessments shall be calculated in accordance with the following equation, rounded to the nearest 0.1 mpg:

$$FE_{adj} = FE[((0.55 \times a_g \times c) + (0.45 \times c) + (0.5556 \times a_g) + 0.4487) / ((0.55 \times a_g) + 0.45)] + IW_g$$

Where:

FE_{adj} = Fuel economy value to be used for determination of gas guzzler tax assessment rounded to the nearest 0.1 mpg.

FE = Combined model type fuel economy calculated in accordance with § 600.208–08, rounded to the nearest 0.0001 mpg.

a_g = Model type highway fuel economy, calculated in accordance with § 600.208–08, rounded to the nearest 0.0001 mpg divided by the model type city fuel economy calculated in accordance with § 600.208–08, rounded to the nearest 0.0001 mpg. The quotient shall be rounded to 4 decimal places.

c = gas guzzler adjustment factor = 1.300×10^{-3} for the 1986 and later model years.

$IW_g = (9.2917 \times 10^{-3} \times SF_{3IWCG}\ FE_{3IWCG}) - (3.5123 \times 10^{-3} \times SF_{4ETWG} \times FE_{4IWCG})$.

Note: Any calculated value of IW less than zero shall be set equal to zero.

SF_{3IWCG} = The 3000 lb. inertia weight class sales in the model type divided by the total model type sales; the quotient shall be rounded to 4 decimal places.

SF_{4ETWG} = The 4000 lb. equivalent test weight sales in the model type divided by the total model type sales, the quotient shall be rounded to 4 decimal places.

FE_{3IWCG} = The 3000 lb. inertial weight class base level combined fuel economy used to calculate the model type fuel economy rounded to the nearest 0.0001 mpg.

FE_{4IWCG} = The 4000 lb. inertial weight class base level combined fuel economy used to calculate the model type fuel economy rounded to the nearest 0.001 mpg.

(b)(1) For passenger automobiles sold after December 31, 1990, with a combined FTP/HFET-based model type fuel economy value of less than 22.5 mpg (as determined in § 600.208–08), calculated in accordance with paragraph (a)(2) of this section and rounded to the

nearest 0.1 mpg, each vehicle fuel economy label shall include a Gas Guzzler Tax statement pursuant to 49 U.S.C. 32908(b)(1)(E). The tax amount stated shall be as specified in paragraph (b)(2) of this section.

(2) For passenger automobiles with a combined general label model type fuel economy value of:

(i) At least 22.5 mpg, no Gas Guzzler Tax statement is required.

(ii) At least 21.5 mpg, but less than 22.5 mpg, the Gas Guzzler Tax statement shall show a tax of $1,000.

(iii) At least 20.5 mpg, but less than 21.5 mpg, the Gas Guzzler Tax statement shall show a tax of $1,300.

(iv) At least 19.5 mpg, but less than 20.5 mpg, the Gas Guzzler Tax statement shall show a tax of $1,700.

(v) At least 18.5 mpg; but less than 19.5 mpg, the Gas Guzzler Tax statement shall show a tax of $2,100.

(vi) At least 17.5 mpg, but less than 18.5 mpg, the Gas Guzzler Tax statement shall show a tax of $2,600.

(vii) At least 16.5 mpg, but less than 17.5 mpg, the Gas Guzzler Tax statement shall show a tax of $3,000.

(viii) At least 15.5 mpg, but less than 16.5 mpg, the Gas Guzzler Tax statement shall show a tax of $3,700.

(ix) At least 14.5 mpg, but less than 15.5 mpg, the Gas Guzzler Tax statement shall show a tax of $4,500.

(x) At least 13.5 mpg, but less than 14.5 mpg, the Gas Guzzler Tax statement shall show a tax of $5,400.

(xi) At least 12.5 mpg, but less than 13.5 mpg, the Gas Guzzler Tax statement shall show a tax of $6,400.

(xii) Less than 12.5 mpg, the Gas Guzzler Tax statement shall show a tax of $7,700.

■ 52. Appendix II to Part 600 is amended by revising paragraph (b) as follows:

Appendix II to Part 600—Sample Fuel Economy Calculations

* * * * *

(b) This sample fuel economy calculation is applicable to 1988 and later model year automobiles.

(1) Assume that a gasoline-fueled vehicle was tested by the Federal Emission Test Procedure and the following results were calculated:

HC = .139 grams/mile.
CO = 1.59 grams/mile.
CO_2 = 317 grams/mile.

(2) Assume that the test fuel used for this test had the following properties:

SG = 0.745.
CWF = 0.868.
NHV = 18,478 Btu/lb.

(3) According to the procedure in § 600.113–08, the city fuel economy or MPG_c, for the vehicle may be calculated by substituting the HC, CO, and CO_2 gram/mile values and the SG, CWF, and NHV values into the following equation:

$$MPG_c = (5174 \times 10^4 \times CWF \times SG) / [((CWF \times HC) + (0.429 \times CO + (0.273 \times CO_2)) ((0.6 \times SG \times NHV) + 5471)]$$

Example:

$$MPG_c = (5174 \times 10^4 \times 0.868 \times 0.745) / [(0.868 \times .139 + 0.429 \times 1.59 + 0.273 \times 317)(0.6 \times 0.745 \times 18478 + 5471)]$$

$$MPG_c = 27.9$$

(4) Assume that the same vehicle was tested by the Federal Highway Fuel Economy Test Procedure and a calculation similar to that shown in (b)(3) of this section resulted in a highway fuel economy of MPG_h of 36.9. According to the procedure in § 600.210(c), the combined fuel economy (called MPG_{comb}) for the vehicle may be calculated by substituting the city and highway fuel economy values into the following equation:

$$MPG_{comb} = \frac{1}{\frac{0.55}{MPG_c} + \frac{0.45}{MPG_h}}$$

$$MPG_{comb} = \frac{1}{\frac{0.55}{27.9} + \frac{0.45}{36.9}}$$

$$MPG_{comb} = 31.3$$

■ 53. Appendix III to Part 600 is revised to read as follows:

Appendix III to Part 600—Sample Fuel Economy Label Calculation

Suppose that a manufacturer called Mizer Motors has a product line composed of eight car lines. Of these eight, four are available with the 3.0 liter, 6 cylinder, sequential multi-point fuel injection, 4-valve per cylinder, and 3-way catalyst engine. These four car lines are:

Ajax
Boredom III
Dodo
Castor (Station Wagon)

A. A car line is defined in subpart A (with additional guidance provided in EPA Advisory Circular 89) as a group of vehicles within a make or division which has a degree of commonality in construction. Car line does not consider any level of decor or opulence and is not generally distinguished by such characteristics as roofline, number of doors, seats, or windows. Station wagons and light duty trucks are, however, identified separately from the remainder of each car line. In other words, a Castor station wagon would be considered a different car line than the normal Castor car line made up of sedans, coupes, etc.

B. The engine considered here is defined as a basic engine in subpart A of this part (with additional guidance provided in EPA Advisory Circular 83A). A basic engine is a unique combination of manufacturer, engine displacement, number of cylinders, fuel system, catalyst usage and other engine and emission control system characteristics specified by the Administrator. A model type is a unique combination of car line, basic engine, and transmission class. Thus Ajax is a car line but Ajax 3.0 liter, 6 cylinder manual four-speed transmission is a model type whereas Ajax 3.0 liter, 6 cylinder automatic three-speed transmission is a different model type.

C. The following calculations provide an example of the procedures described in subpart C of this part for the calculation of vehicle configuration and model type fuel economy values. In order to simplify the presentation, only city fuel economy values are included (as determined by either the derived 5-cycle method or vehicle-specific 5-cycle based method). The procedure is identical for highway and combined fuel economy values.

Step I. Input data as supplied by the manufacturer or as determined from testing conducted by the Administrator.

Manufacturer—Mizer Motors

Basic Engine: (3.0 liter, 6 cylinder, sequential multi-point fuel injection, 4-valve per cylinder, 3-way catalyst).

Test vehicle carline	Engine code	Trans	Inertia weight	Axle ratio	Harmonically averaged. city MPG	Specific label MPG [1]	Vehicle config. sales
Ajax	1	M–4	3500	2.73	16.1001	16	15,000
Ajax	2	A–3	3500	2.56	15.9020	16	35,000
Boredom III	4	M–4	4000	3.08	14.2343	14	10,000
Ajax	3	M–4	4000	3.36	15.0000	15	15,000
Boredom III	8	A–3	4000	2.56	13.8138	14	25,000
Boredom III	5	A–3	4500	3.08	13.2203	13	20,000
Castor	5	A–3	5000	3.08	10.6006	11	40,000

[1] The vehicle configuration fuel economy values, rounded to the nearest mile per gallon, are the fuel economy values that would be used on specific labels for that vehicle configuration.

Step II. Group vehicle fuel economy and sales data according to base level combinations within this basic engine.

Base level	Transmission class	Inertia weight	Miles per gallon	Projected vehicle configuration sales
A	Manual-4	3,500	16.1001	15,000
B	Automatic-3	3,500	15.9020	35,000
C	Manual-4	4,000	14.2343	10,000
C	Manual-4	4,000	15.0000	15,000
D	Automatic-3	4,000	13.8138	25,000
E	Automatic-3	4,500	13.2203	20,000
F	Automatic-3	5,000	10.6006	40,000

Step III. Determine base level fuel economy values.

A. For all the base levels except the base level which includes 4,000 pound, manual four-speed transmission data, the base level fuel economy is as noted in Step II since only one vehicle configuration was tested within each of these base levels.

3,500 lb/M4 transmission.	16.1001 mpg.
3,500 lb/A3 transmission.	15.9020 mpg.
4,000 lb/A3 transmission.	13.8138 mpg.
4,500 lb/A3 transmission.	13.2203 mpg.
5,000 lb/A3 transmission.	10.6006 mpg.

B. Since data from more than one vehicle configuration are included in the 4,000-pound, manual four-speed transmission base level, this fuel economy is harmonically averaged in proportion to the percentage of total sales of all vehicle configurations tested within that base level represented by each vehicle configuration tested within that base level.

$$\text{Base level fuel economy} = \frac{1}{\left[\begin{array}{l}\text{Fraction of total sales of configurations}\\ \text{tested represented by}\\ \text{configuration No. 1 sales}\end{array}\right]\left[\dfrac{1}{\begin{array}{l}\text{Configuration}\\ \text{No. 1 fuel economy}\end{array}}\right] + \left[\begin{array}{l}\text{Fraction of total sales}\\ \text{of configurations tested}\\ \text{represented by configuration}\\ \text{No. 2 sales}\end{array}\right]\left[\dfrac{1}{\begin{array}{l}\text{Configuration}\\ \text{No. 2 1 fuel economy}\end{array}}\right]}$$

Base level: M4 transmission, 4000 pounds:

$$\frac{1}{\left[\dfrac{10000}{25000}\right]\dfrac{1}{14.2343} + \left[\dfrac{15000}{25000}\right]\dfrac{1}{15.0000}} = 14.6840 \text{ miles per gallon}$$

Therefore, the 4000 pound, M4 transmission fuel economy is 14.6840 miles per gallon.

Note that the car line of the test vehicle using a given engine makes no difference—only the weight and transmission do.

Step IV. For each model type offered by the manufacturer with that basic engine, determine the sales fraction represented by each inertia weight/transmission class combination and the corresponding fuel economy.

Ajax	M4	0.4000 at 3,500 lb	16.1001
		0.6000 at 4,000 lb	14.6840
	A3	0.3000 at 3,500 lb	15.9020
		0.7000 at 4,000 lb	13.8138
Dodo	M4	0.4000 at 3,500 lb	16.1001
		0.6000 at 4,000 lb	14.6840
	A3	0.3000 at 3,500 lb	15.9020
		0.7000 at 4,000 lb	13.8138
Boredom III	M4	1.0000 at 4,000 lb	14.6840
	A3	0.2500 at 4,000 lb	13.8138
		0.7500 at 4,500 lb	13.2203
Castor	A3	0.2000 at 4,500 lb	13.2203
		0.8000 at 5,000 lb	10.6006

Step V. Determine fuel economy for each model type (that is, car line/basic engine/transmission class combination).

Ajax, 3.0 liter, 6 cylinder, A3 transmission, model type MPG is calculated as follows:

$$\frac{1}{\left[\frac{\text{The fraction of Ajax vehicles using the 3.0 liter, 6 cylinder engine which fall in the 3500 lb inertia weight class with an A3 transmission}}{\text{Fuel economy for 3.0 liter, 6 cylinder 3500 lb A3 transmission base level}}\right] + \left[\frac{\text{The fraction of Ajax vehicles using the 3.0 liter, 6 cylinder engine which fall in the 4000 lb inertia weight class with an A3 transmission}}{\text{Fuel economy for 3.0 liter 6 cylinder 4000 lb A3 transmission base level}}\right]}$$

$$= \frac{1}{\left[\frac{0.3000}{15.9020}\right] + \left[\frac{0.7000}{13.8138}\right]} = 14.3803 \text{ mpg, which rounds to 14 MPG}^{1}$$

Similarly, Ajax and Dodo 3.0 liter, 6 cylinder, M4 model type MPG is calculated as follows:

$$\frac{1}{\left[\frac{0.4000}{16.1001}\right] + \left[\frac{0.6000}{14.6840}\right]} = 15.2185, \text{ which rounds to 15 MPG}^{1}$$

Dodo 3.0 liter, 6 cylinder, A3 model type MPG is calculated as follows:

$$= \frac{1}{\left[\frac{0.3000}{15.9020}\right] + \left[\frac{0.7000}{13.8138}\right]} = 14.3803 \text{ mpg, which rounds to 14 MPG}^{1}$$

Boredom III 3.0 liter 6 cylinder M4 model type MPG = 14.6840 mpg, which rounds to 15 mi./gal[1]

Boredom III 3.0 liter, 6 cylinder, A3 model type MPG is calculated as follows:

$$\frac{1}{\left[\frac{0.2500}{13.8138}\right] + \left[\frac{0.7500}{13.2203}\right]} = 13.3638, \text{ which rounds to 13 MPG}^{1}$$

Castor 3.0 liter, 6 cylinder, A3 model type MPG is calculated as follows:

$$\frac{1}{\left[\frac{0.2000}{13.2203}\right] + \left[\frac{0.8000}{10.6006}\right]} = 11.0381, \text{ which rounds to 11 MPG}^{1}$$

[1] The model type fuel economy values rounded to the nearest mile per gallon, are the fuel economy values listed in the EPA Fuel Economy Guide and used on the general labels (window stickers) for production vehicles for that model year.

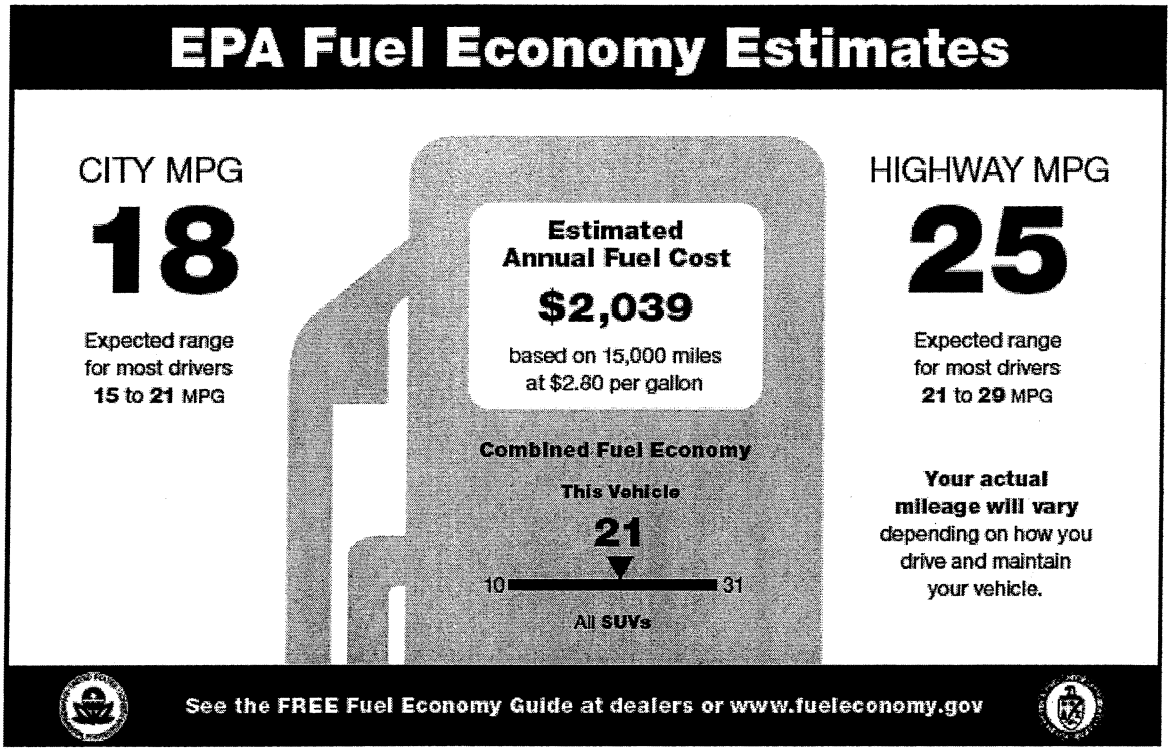
Note that even though no Dodo was actually tested, this approach permits its fuel economy figure to be estimated, based on the inertia weight distribution of projected Dodo sales within a specific engine and transmission grouping.

■ 54. A new Appendix IV is added to read as follows:

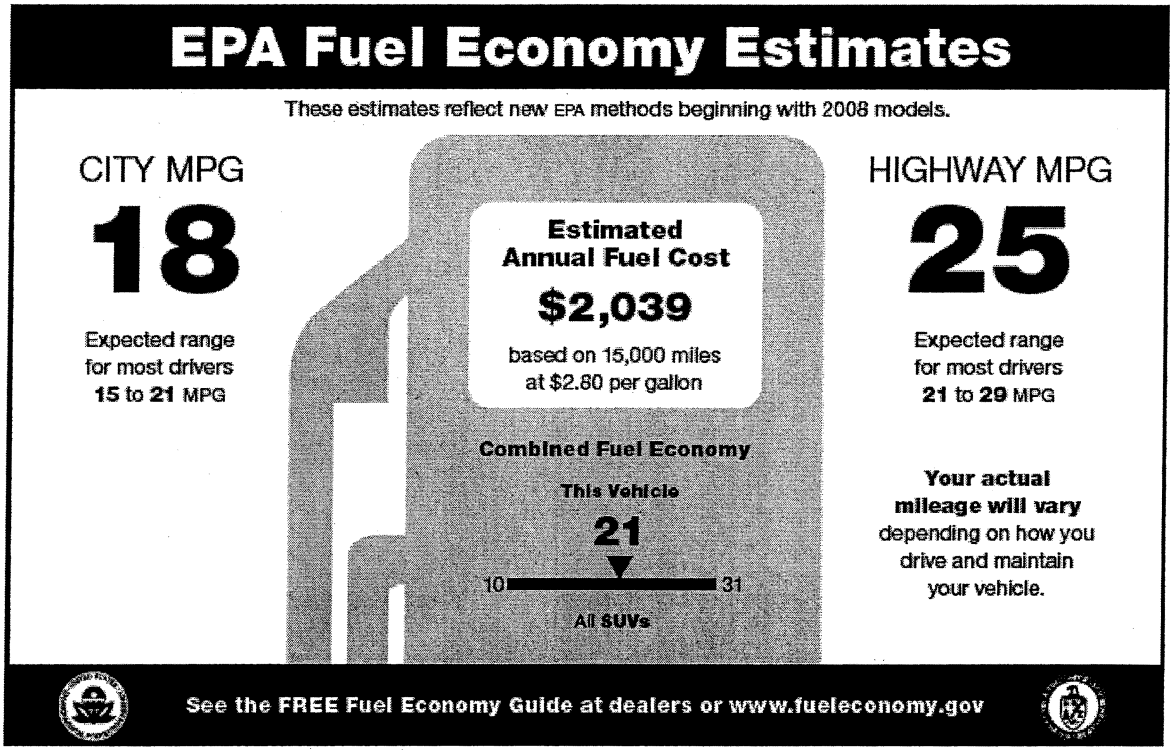
Appendix IV to Part 600—Sample Fuel Economy Labels for 2008 and Later Model Year Vehicles

BILLING CODE 6560–50–P

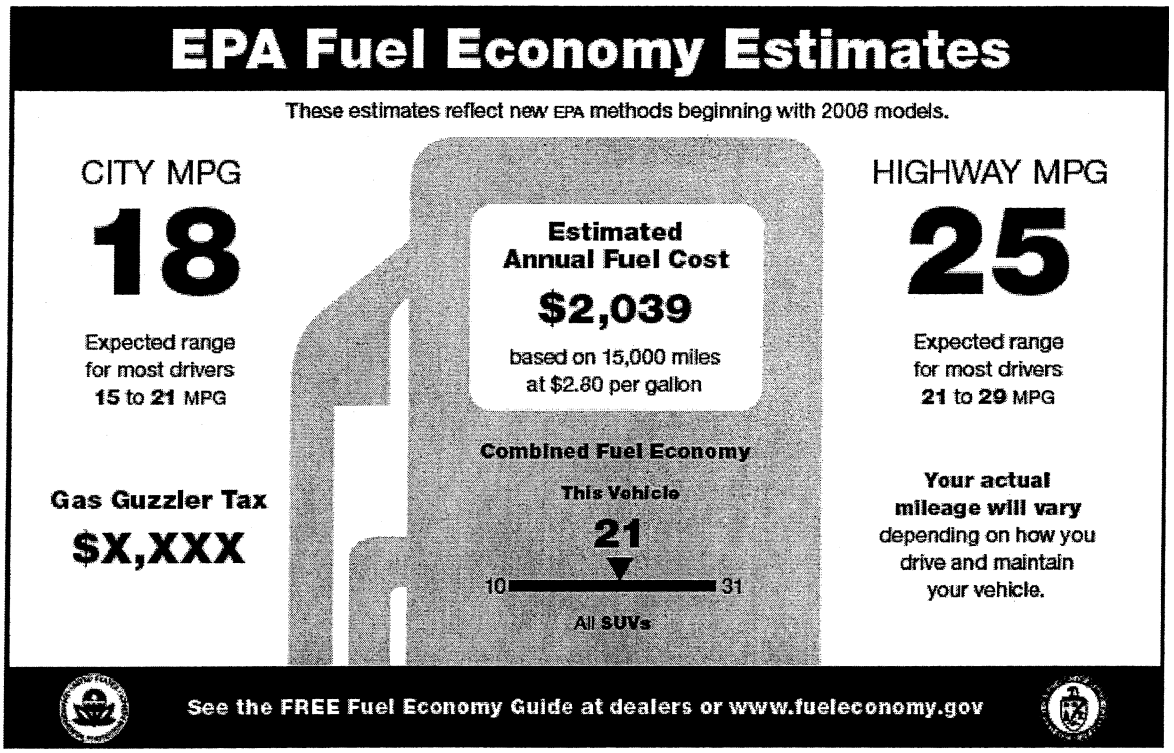
A. Gasoline (or diesel)-fueled vehicle label



B. Gasoline (or diesel)-fueled vehicle label (with transitional text statement for MY 2008 and 2009 vehicles only)

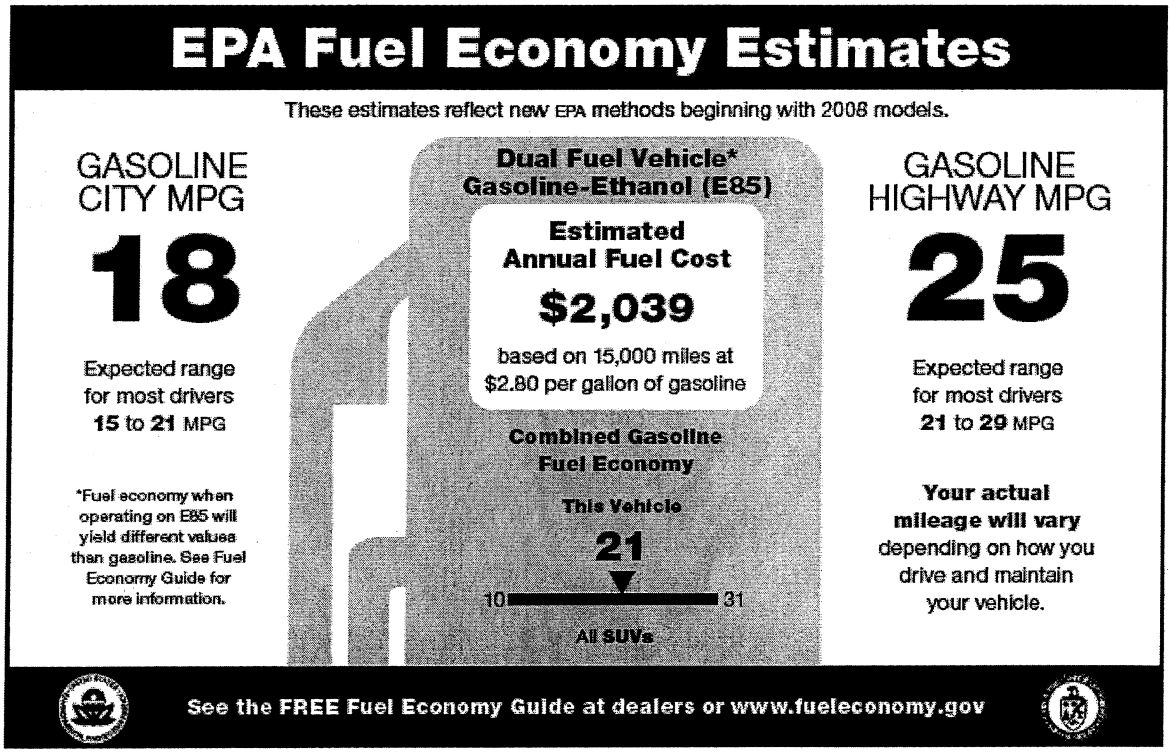


C. Gasoline-fueled Gas Guzzler vehicle label

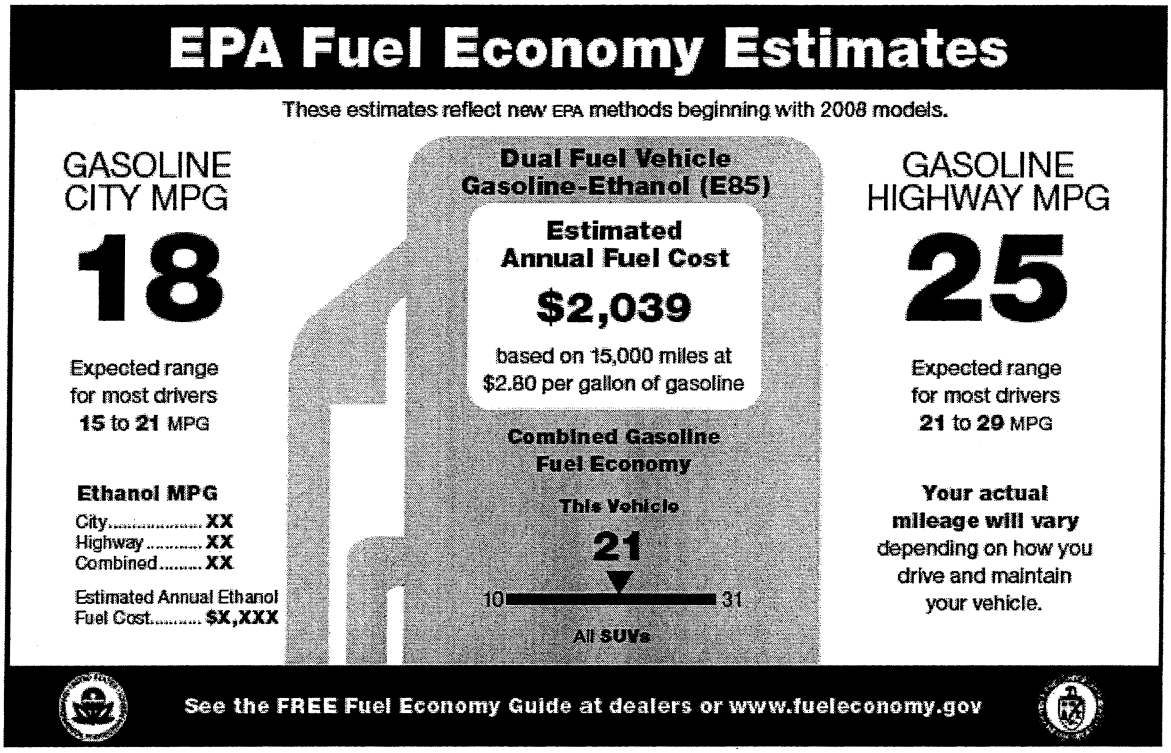


D. Dual Fuel Vehicle Label (Ethanol/Gasoline)

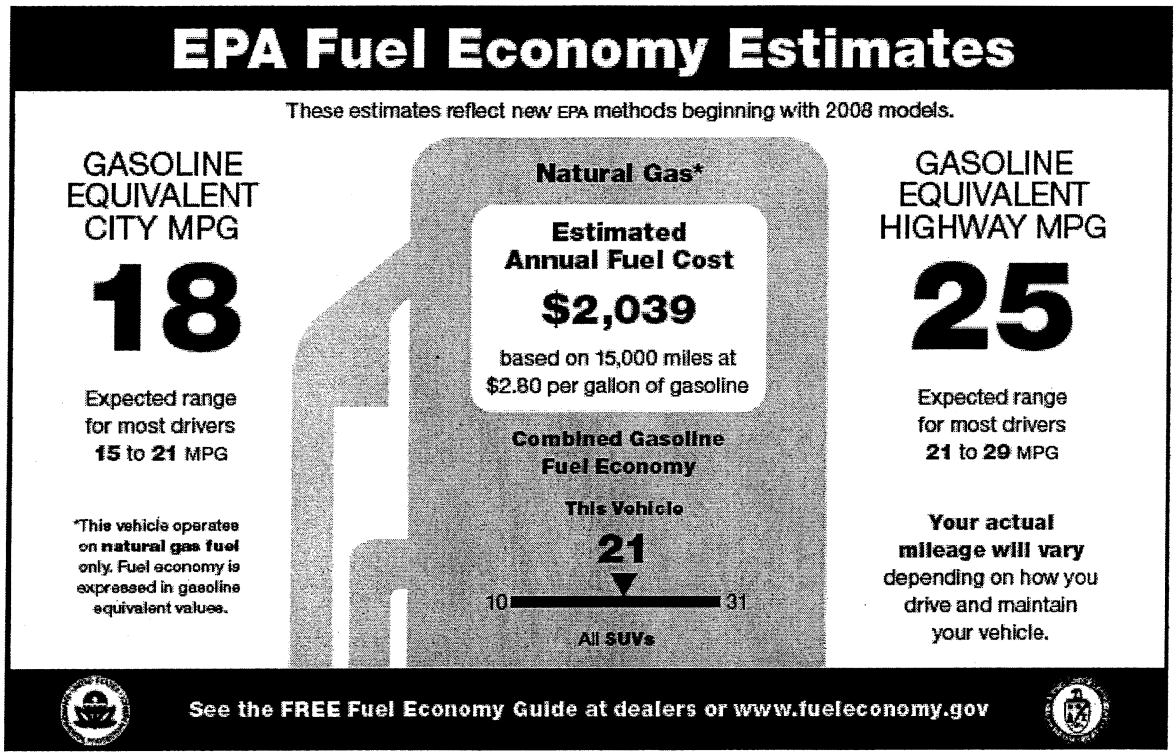
Option 1—without alternate fuel economy)



Option 2—with alternate fuel economy

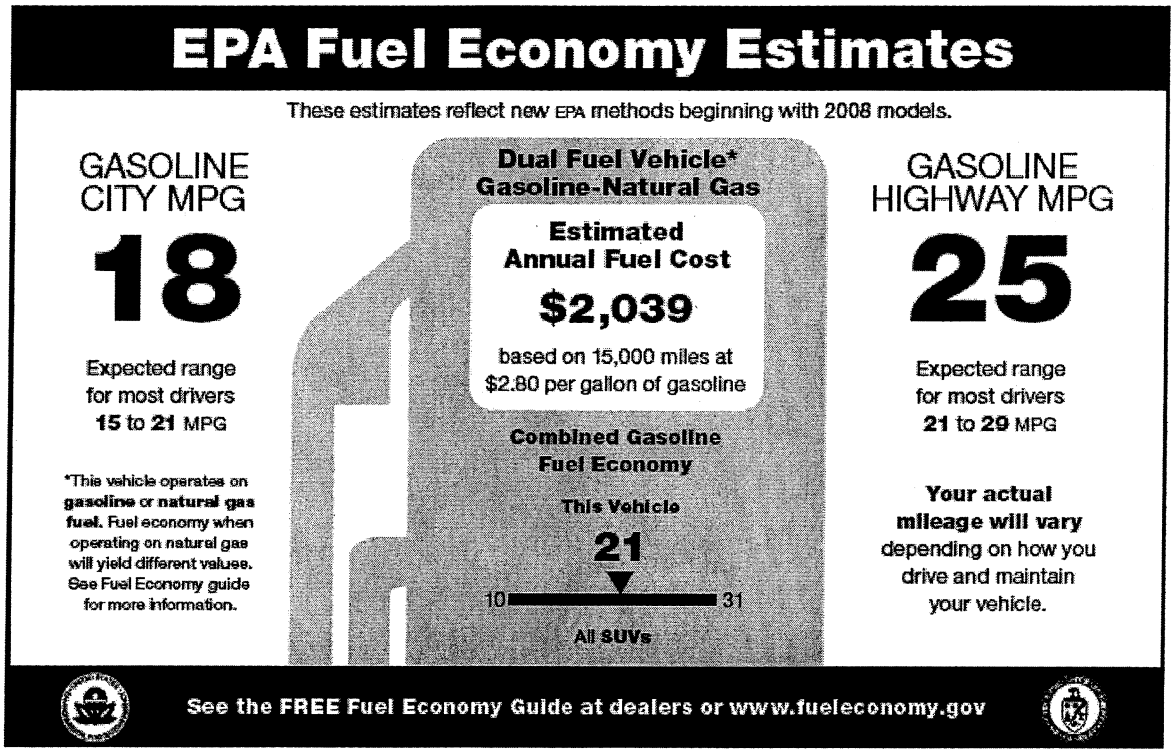


E. Natural Gas Vehicle Label

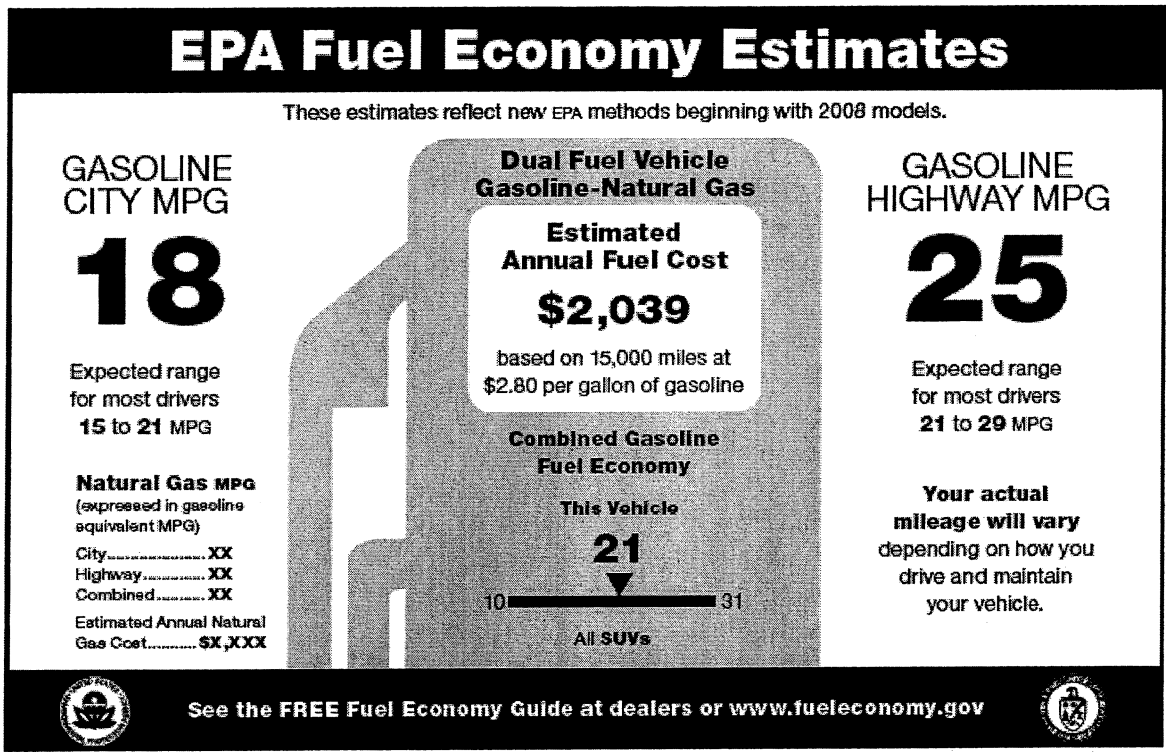


F. Dual Fuel Natural Gas Label

Option 1—without alternate fuel economy



Option 2—With alternate fuel economy



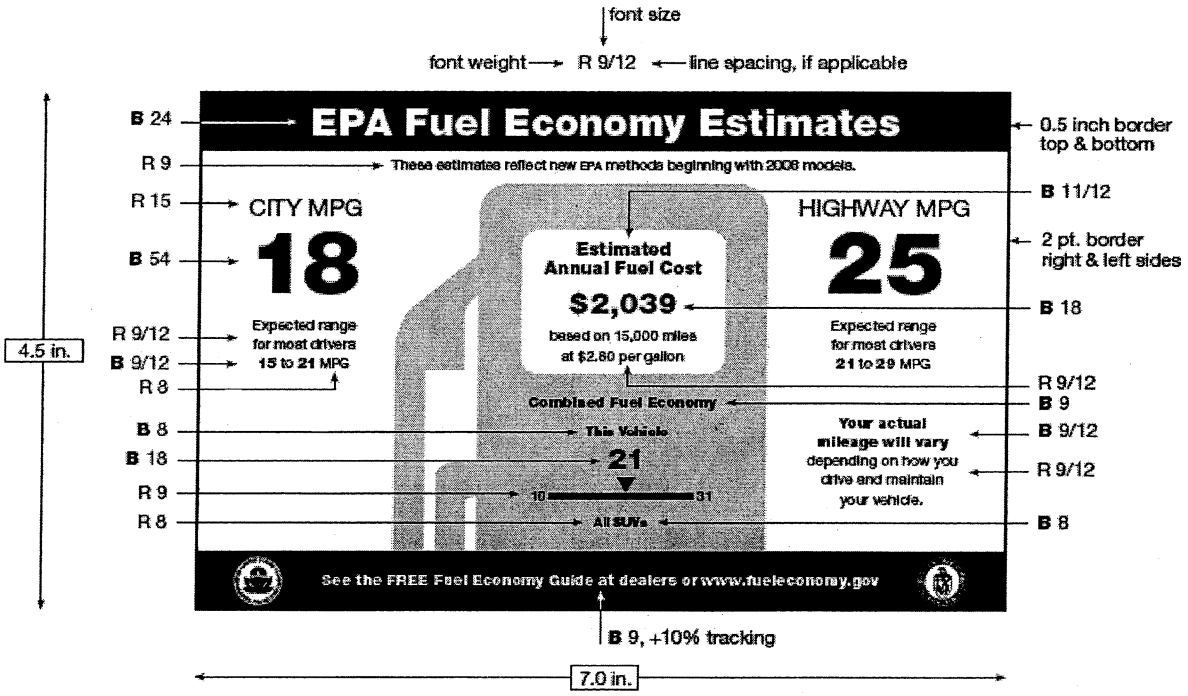
■ 55. A new Appendix V is added to read as follows:

Appendix V to Part 600—Fuel Economy Label Style Guidelines for 2008 and Later Model Year Vehicles

A. Format Guidelines for Gasoline (or Diesel) Vehicles

Gasoline Fuel Economy Label

Set all copy in either the Helvetica or Arial font family — do not mix.
Use only Regular/Roman (R) and **Black** weights (B) — not bold, thin, italic or other font styles.



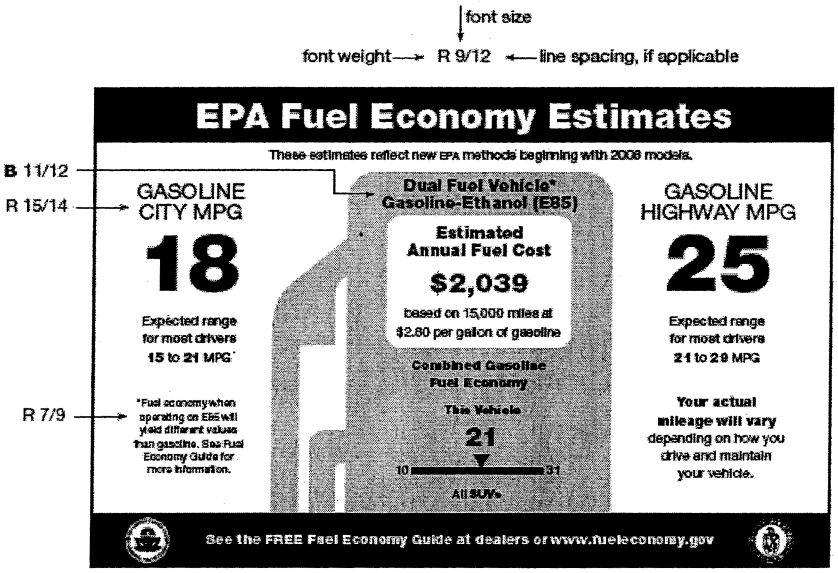
Combined fuel economy bar is a 4 pt. (0.056 in.) rule that is 90 pt. (1.25 in.) long.
Indicator triangle above bar is from Windings 3 at 14 pt. size. If drawn, 12 pt. (0.167 in.) each side.

B. Format Guidelines for Ethanol and Natural Gas Dual Fuel Vehicles. Unless otherwise indicated, the format specifications in Appendix V. A. apply.

Dual Fuel Vehicle: Gasoline-Ethanol

BASIC FUEL ECONOMY LABEL

Set all copy in either the Helvetica or Arial font family — do not mix.
Use only Regular/Roman (R) and **Black** weights (B) — not bold, thin, italic or other font styles.



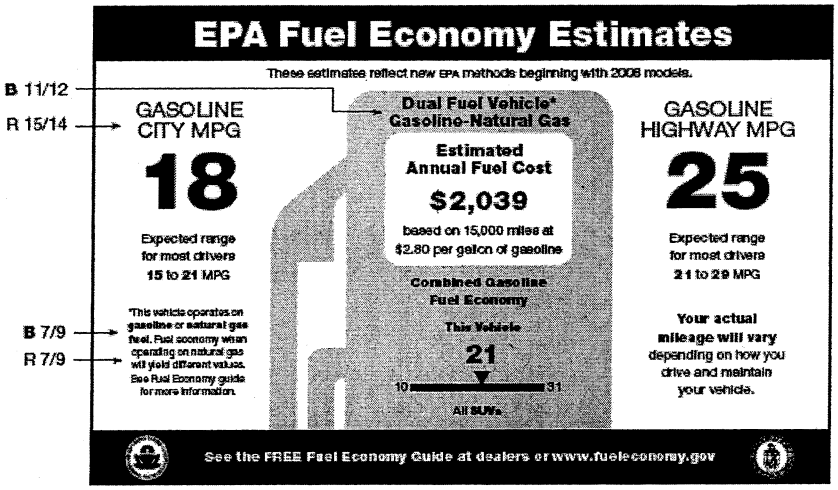
Dual Fuel Vehicle: Gasoline-Natural Gas

BASIC FUEL ECONOMY LABEL

Set all copy in either the Helvetica or Arial font family — do not mix.
Use only Regular/Roman (R) and **Black** weights (**B**) — not bold, thin, italic or other font styles.

font size

font weight → R 9/12 ← line spacing, if applicable



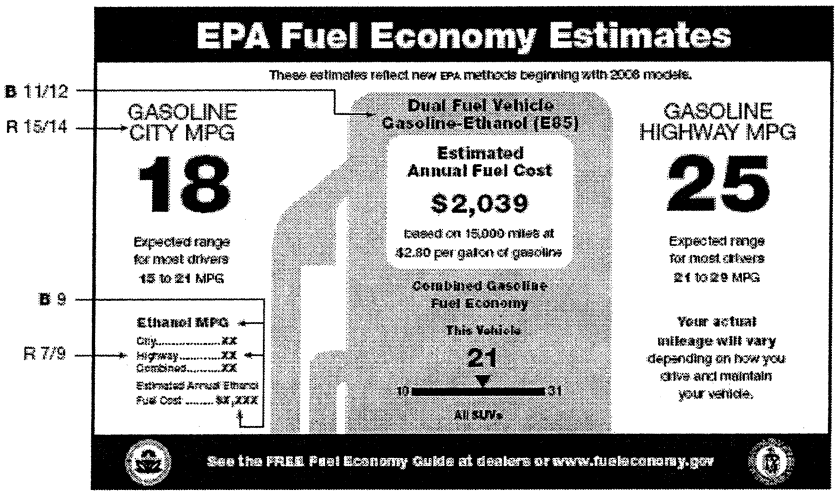
Dual Fuel Vehicle: Gasoline-Ethanol

WITH ETHANOL MILEAGE INFORMATION

Set all copy in either the Helvetica or Arial font family — do not mix.
Use only Regular/Roman (R) and **Black** weights (**B**) — not bold, thin, italic or other font styles.

font size

font weight → R 9/12 ← line spacing, if applicable

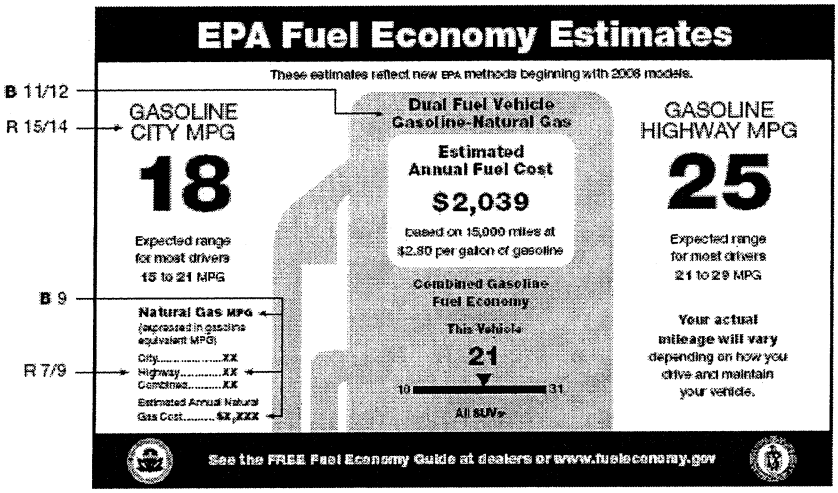


Dual Fuel Vehicle: Gasoline-Natural Gas

WITH NATURAL GAS MILEAGE INFORMATION

Set all copy in either the Helvetica or Arial font family — do not mix.
Use only Regular/Roman (R) and **Black** weights (**B**) — not bold, thin, italic or other font styles.

font size
font weight → R 9/12 ← line spacing, if applicable



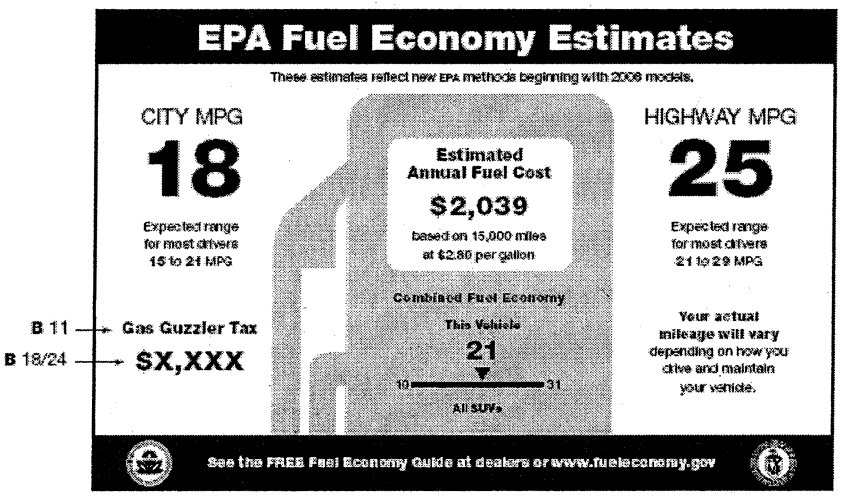
C. Format Guidelines showing Gas Guzzler. Unless otherwise indicated, the format specifications in Appendix V. A. apply.

Gasoline Fuel Economy Label

WITH GAS GUZZLER TAX

Set all copy in either the Helvetica or Arial font family — do not mix.
Use only Regular/Roman (R) and **Black** weights (**B**) — not bold, thin, italic or other font styles.

font size
font weight → R 9/12 ← line spacing, if applicable



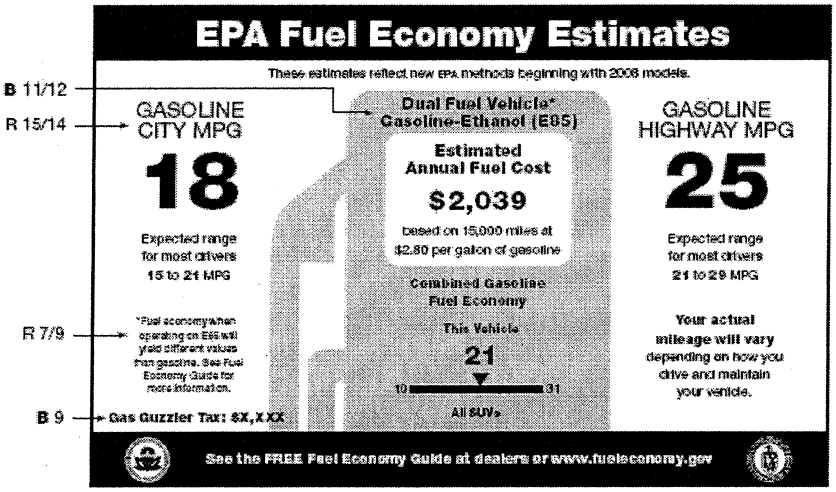
Dual Fuel Vehicle: Gasoline-Ethanol

WITH GAS GUZZLER TAX

Set all copy in either the Helvetica or Arial font family — do not mix.
Use only Regular/Roman (R) and **Black** weights (**B**) — not bold, thin, italic or other font styles.

font size

font weight → R 9/12 ← line spacing, if applicable



D. Format Guidelines for Natural Vehicles. Unless otherwise indicated, the format specifications in Appendix V. A. apply.

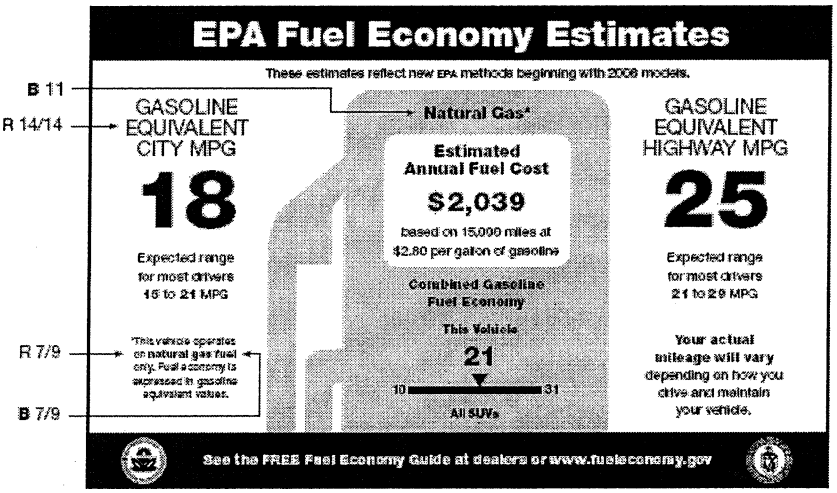
Alternative Fuel Vehicle: Natural Gas

BASIC FUEL ECONOMY LABEL

Set all copy in either the Helvetica or Arial font family — do not mix.
Use only Regular/Roman (R) and **Black** weights (**B**) — not bold, thin, italic or other font styles.

font size

font weight → R 9/12 ← line spacing, if applicable



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BILLING CODE 6560–50–P