

(2) *Reduced reheat, with externally-controlled, fixed-displacement or pneumatic variable displacement compressor* means a system in which the output of either compressor is controlled by cycling the compressor clutch off-and-on via an electronic signal, based on input from sensors (e.g., position or setpoint of interior temperature control, interior temperature, evaporator outlet air temperature, or refrigerant temperature) and air temperature at the outlet of the evaporator can be controlled to a level at 41°F, or higher.

(3) *Default to recirculated air mode* means that the default position of the mechanism which controls the source of air supplied to the air conditioning system shall change from outside air to recirculated air when the operator or the automatic climate control system has engaged the air conditioning system (i.e., evaporator is removing heat), except under those conditions where dehumidification is required for visibility (i.e., defogger mode). In vehicles equipped with interior air quality sensors (e.g., humidity sensor, or carbon dioxide sensor), the controls may determine proper blend of air supply sources to maintain freshness of the cabin air and prevent fogging of windows while continuing to maximize the use of recirculated air. At any time, the vehicle operator may manually select the non-recirculated air setting during vehicle operation but the system must default to recirculated air mode on subsequent vehicle operations (i.e., next vehicle start). The climate control system may delay switching to recirculation mode until the interior air temperature is less than the outside air temperature, at which time the system must switch to recirculated air mode.

(4) *Blower motor controls which limit waste energy* means a method of controlling fan and blower speeds which does not use resistive elements to decrease the voltage supplied to the motor.

(5) *Improved condensers and/or evaporators* means that the coefficient of performance (COP) of air conditioning system using improved evaporator and condenser designs is 10 percent higher, as determined using the bench test procedures described in SAE J2765 "Pro-

cedure for Measuring System COP of a Mobile Air Conditioning System on a Test Bench," when compared to a system using standard, or prior model year, component designs (SAE J2765 is incorporated by reference in § 86.1). The manufacturer must submit an engineering analysis demonstrating the increased improvement of the system relative to the baseline design, where the baseline component(s) for comparison is the version which a manufacturer most recently had in production on the same vehicle design or in a similar or related vehicle model. The dimensional characteristics (e.g., tube configuration/thickness/spacing, and fin density) of the baseline component(s) shall be compared to the new component(s) to demonstrate the improvement in coefficient of performance.

(6) *Oil separator* means a mechanism which removes at least 50 percent of the oil entrained in the oil/refrigerant mixture exiting the compressor and returns it to the compressor housing or compressor inlet, or a compressor design which does not rely on the circulation of an oil/refrigerant mixture for lubrication.

[77 FR 63166, Oct. 15, 2012, as amended at 79 FR 23736, Apr. 28, 2014]

**§ 86.1869-12 CO<sub>2</sub> credits for off-cycle CO<sub>2</sub>-reducing technologies.**

(a) Manufacturers may generate credits for CO<sub>2</sub>-reducing technologies where the CO<sub>2</sub> reduction benefit of the technology is not adequately captured on the Federal Test Procedure and/or the Highway Fuel Economy Test. These technologies must have a measurable, demonstrable, and verifiable real-world CO<sub>2</sub> reduction that occurs outside the conditions of the Federal Test Procedure and the Highway Fuel Economy Test. These optional credits are referred to as "off-cycle" credits. Off-cycle technologies used to generate emission credits are considered emission-related components subject to applicable requirements, and must be demonstrated to be effective for the full useful life of the vehicle. Unless the manufacturer demonstrates that the technology is not subject to in-use deterioration, the manufacturer must account for the deterioration in their analysis. Durability evaluations of off-

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cycle technologies may occur at any time throughout a model year, provided that the results can be factored into the data provided in the model year report. Off-cycle credits may not be approved for crash-avoidance technologies, safety critical systems or systems affecting safety-critical functions, or technologies designed for the purpose of reducing the frequency of vehicle crashes. Off-cycle credits may not be earned for technologies installed on a motor vehicle to attain compliance with any vehicle safety standard or any regulation set forth in Title 49 of the Code of Federal Regulations. The manufacturer must use one of the three options specified in this section to determine the CO<sub>2</sub> gram per mile credit applicable to an off-cycle technology. Note that the option provided in paragraph (b) of this section applies only to the 2014 and later model years.

The manufacturer should notify EPA in their pre-model year report of their intention to generate any credits under this section.

(b) *Credit available for certain off-cycle technologies.* The provisions of this paragraph (b) are applicable only to 2014 and later model year vehicles. EPA may request data, engineering analyses, or other information that supports a manufacturer's use of the credits in this paragraph (b).

(1) The manufacturer may generate a CO<sub>2</sub> gram/mile credit for certain technologies as specified in this paragraph (b)(1). Technology definitions are in paragraph (b)(4) of this section. Calculated credit values shall be rounded to the nearest 0.1 grams/mile.

(i) *Waste heat recovery.* The credit shall be calculated using the following formula, rounded to the nearest 0.1 grams/mile:

$$\text{Credit} \left( \frac{g}{mi} \right) = ELR \times 0.007$$

Where:

ELR = the electrical load reduction of the waste heat recovery system, in Watts, calculated as an average over 5-cycle testing.

(ii) *High efficiency exterior lights.* Credits may be accrued for high efficiency lighting as defined in paragraph (b)(4) of this section based on the lighting locations with such lighting installed. Credits for high efficiency lighting are the sum of the credits for the applicable lighting locations in the following table (rounded to the nearest 0.1 grams/mile), or, if all lighting locations in the table are equipped with high efficiency lighting, the total credit for high efficiency lighting shall be 1.0 grams/mile. Lighting components that result in credit levels less than those shown in

the following table are not eligible for credits.

Lighting Component	Credit (grams/mile)
Low beam .....	0.38
High beam .....	0.05
Parking/position .....	0.10
Turn signal, front .....	0.06
Side marker, front .....	0.06
Tail .....	0.10
Turn signal, rear .....	0.06
Side marker, rear .....	0.06
License plate .....	0.08

(iii) *Solar panels.* (A) Credits for solar panels used solely for charging the battery of an electric vehicle, plug-in hybrid electric vehicle, or hybrid electric vehicle shall be calculated using the following equation, and rounded to the nearest 0.1 grams/mile:

$$\text{Credit} \left( \frac{g}{mi} \right) = 0.04385 \times P_{\text{panel}}$$

Where:

P<sub>panel</sub> is the is the rated power of the solar panel, in Watts, determined under the

standard test conditions of 1000 Watts per meter squared direct solar irradiance at a panel temperature of 25 degrees Celsius ( $\pm 2$  degrees) with an air mass spectrum of 1.5 (AM1.5).

(B) Credits for solar panels used solely for active vehicle ventilation systems are those specified in paragraph (b)(1)(viii)(E).

(C) Credits for solar panels used both for active cabin ventilation and for charging the battery of an electric vehicle, plug-in hybrid electric vehicle, or hybrid electric vehicle shall be calculated using the following equation, and rounded to the nearest 0.1 grams/mile:

$$\text{Credit} \left( \frac{g}{mi} \right) = C_{vent} + 0.04385 \times (P_{panel} - P_{vent})$$

Where:

$C_{vent}$  is the credit attributable to active cabin ventilation from paragraph (b)(1)(viii)(E) of this section;

$P_{panel}$  is the is the rated power of the solar panel, in Watts, determined under the standard test conditions of 1000 Watts per meter squared direct solar irradiance at a panel temperature of 25 degrees Celsius ( $\pm 2$  degrees) with an air mass spectrum of 1.5 (AM1.5); and

$P_{vent}$  is the amount of power, in Watts, required to run the active cabin ventilation system.

(iv) *Active aerodynamic improvements.* (A) The credit for active aerodynamic improvements for passenger automobiles shall be calculated using the following equation, and rounded to the nearest 0.1 grams/mile:

$$\text{Credit} \left( \frac{g}{mi} \right) = 19.36 \times CD_{reduced}$$

Where:

$CD_{reduced}$  is the percent reduction in the coefficient of drag ( $C_d$ ), shown as a value from 0 to 1. The coefficient of drag shall be determined using good engineering judgment consistent with standard industry test methods and practices.

(B) The credit for active aerodynamic improvements for light trucks shall be calculated using the following equation, and rounded to the nearest 0.1 grams/mile:

$$\text{Credit} \left( \frac{g}{mi} \right) = 33.16 \times CD_{reduced}$$

Where:

$CD_{reduced}$  is the percent reduction in the coefficient of drag ( $C_d$ ), shown as a value from 0 to 1. The coefficient of drag shall be determined using good engineering judgment consistent with standard industry test methods and practices.

(v) *Engine idle start-stop.*

(A) The passenger automobile credit for engine idle start-stop systems is 2.5 grams/mile, provided that the vehicle is equipped with an electric heater circulation system (or a technology that provides a similar function). For vehi-

cles not equipped with such systems the credit is 1.5 grams/mile.

(B) The light truck credit for engine idle start-stop systems is 4.4 grams/mile, provided that the vehicle is equipped with an electric heater circulation system (or a technology that provides a similar function). For vehicles not equipped with such systems the credit is 2.9 grams/mile.

(vi) *Active transmission warm-up.* Systems using a single heat-exchanging loop that serves both transmission and engine warm-up functions are eligible

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for the credits in either paragraph (b)(1)(vi) or (b)(1)(vii) of this section, but not both.

(A) The passenger automobile credit is 1.5 grams/mile.

(B) The light truck credit is 3.2 grams/mile.

(vii) *Active engine warm-up.* Systems using a single heat-exchanging loop that serves both transmission and engine warm-up functions are eligible for the credits in either paragraph (b)(1)(vi) or (b)(1)(vii) of this section, but not both.

(A) The passenger automobile credit is 1.5 grams/mile.

(B) The light truck credit is 3.2 grams/mile.

(viii) *Thermal control technologies.* The maximum credit allowed for thermal control technologies is limited to 3.0 g/mi for passenger automobiles and to 4.3 g/mi for light trucks.

(A) *Glass or glazing.* Glass or glazing credits are calculated using the following equation, and rounded to the nearest 0.1 grams/mile:

$$\text{Credit} = \left[ Z \times \sum_{i=1}^n \frac{T_i \times G_i}{G} \right]$$

Where:

Credit = the total glass or glazing credits, in grams per mile rounded to the nearest 0.1 grams/mile. The credit may not exceed 2.9 g/mi for passenger automobiles or 3.9 g/mi for light trucks;

Z = 0.3 for passenger automobiles and 0.4 for light trucks;

G<sub>i</sub> = the measured glass area of window *i*, in square meters and rounded to the nearest tenth;

G = the total glass area of the vehicle, in square meters and rounded to the nearest tenth;

T<sub>i</sub> = the estimated temperature reduction for the glass area of window *i*, determined using the following formula:

$$T_i = 0.3987 \times (Tts_{base} - Tts_{new})$$

Where:

Tts<sub>new</sub> = the total solar transmittance of the glass, measured according to ISO 13837, "Safety glazing materials—Method for determination of solar transmittance" (incorporated by reference in §86.1).

Tts<sub>base</sub> = 62 for the windshield, side-front, side-rear, rear-quarter, and backlite locations, and 40 for rooflite locations.

(B) *Active seat ventilation.* The passenger automobile credit is 1.0 grams/mile. The light truck credit is 1.3 grams/mile.

(C) *Solar reflective surface coating.* The passenger automobile credit is 0.4 grams/mile. The light truck credit is 0.5 grams/mile.

(D) *Passive cabin ventilation.* The passenger automobile credit is 1.7 grams/

mile. The light truck credit is 2.3 grams/mile.

(E) *Active cabin ventilation.* The passenger automobile credit is 2.1 grams/mile. The light truck credit is 2.8 grams/mile.

(2) The maximum allowable decrease in the manufacturer's combined passenger automobile and light truck fleet average CO<sub>2</sub> emissions attributable to use of the default credit values in paragraph (b)(1) of this section is 10 grams per mile. If the total of the CO<sub>2</sub> g/mi credit values from the paragraph (b)(1) of this section does not exceed 10 g/mi for any passenger automobile or light truck in a manufacturer's fleet, then the total off-cycle credits may be calculated according to paragraph (f) of this section. If the total of the CO<sub>2</sub> g/mi credit values from the table in paragraph (b)(1) of this section exceeds 10 g/mi for any passenger automobile or light truck in a manufacturer's fleet, then the gram per mile decrease for the combined passenger automobile and light truck fleet must be determined according to paragraph (b)(2)(i) of this section to determine whether the 10 g/mi limitation has been exceeded.

(i) Determine the gram per mile decrease for the combined passenger automobile and light truck fleet using the following formula:

$$\text{Decrease} = \frac{\text{Credits} \times 1,000,000}{[(\text{Prod}_C \times 195,264) + (\text{Prod}_T \times 225,865)]}$$

Where:

Credits = The total of passenger automobile and light truck credits, in Megagrams, determined according to paragraph (f) of this section and limited to those credits accrued by using the default gram per mile values in paragraph (b)(1) of this section.

Prod<sub>C</sub> = The number of passenger automobiles produced by the manufacturer and delivered for sale in the U.S.

Prod<sub>T</sub> = The number of light trucks produced by the manufacturer and delivered for sale in the U.S.

(ii) If the value determined in paragraph (b)(2)(i) of this section is greater than 10 grams per mile, the total credits, in Megagrams, that may be accrued by a manufacturer using the default gram per mile values in paragraph (b)(1) of this section shall be determined using the following formula:

$$\text{Credit (Megagrams)} = \frac{[10 \times ((\text{Prod}_C \times 195,264) + (\text{Prod}_T \times 225,865))]}{1},000,000$$

Where:

Prod<sub>C</sub> = The number of passenger automobiles produced by the manufacturer and delivered for sale in the U.S.

Prod<sub>T</sub> = The number of light trucks produced by the manufacturer and delivered for sale in the U.S.

(iii) If the value determined in paragraph (b)(2)(i) of this section is not greater than 10 grams per mile, then the credits that may be accrued by a manufacturer using the default gram per mile values in paragraph (b)(1) of this section do not exceed the allowable limit, and total credits may be determined for each category of vehicles according to paragraph (f) of this section.

(iv) If the value determined in paragraph (b)(2)(i) of this section is greater than 10 grams per mile, then the combined passenger automobile and light truck credits, in Megagrams, that may be accrued using the calculations in paragraph (f) of this section must not exceed the value determined in paragraph (b)(2)(ii) of this section. This limitation should generally be done by reducing the amount of credits attributable to the vehicle category that caused the limit to be exceeded such that the total value does not exceed the value determined in paragraph (b)(2)(ii) of this section.

(3) In lieu of using the default gram per mile values specified in paragraph

(b)(1) of this section for specific technologies, a manufacturer may determine an alternative value for any of the specified technologies. An alternative value must be determined using one of the methods specified in paragraph (c) or (d) of this section.

(4) Definitions for the purposes of this paragraph (b) are as follows:

(i) *Active aerodynamic improvements* means technologies that are automatically activated under certain conditions to improve aerodynamic efficiency (e.g., lowering of the coefficient of drag, or Cd), while preserving other vehicle attributes or functions.

(ii) *High efficiency exterior lighting* means a lighting technology that, when installed on the vehicle, is expected to reduce the total electrical demand of the exterior lighting system when compared to conventional lighting systems. To be eligible for this credit, the high efficiency lighting must be installed in one or more of the following lighting components: low beam, high beam, parking/position, front and rear turn signals, front and rear side markers, taillights, backup/reverse lights, and/or license plate lighting.

(iii) *Engine idle start-stop* means a technology which enables a vehicle to automatically turn off the engine when the vehicle comes to a rest and restarts the engine when the driver applies

pressure to the accelerator or releases the brake. Off-cycle engine start-stop credits will only be allowed for a vehicle if the Administrator has made a determination under the testing and calculation provisions in 40 CFR Part 600 that engine start-stop is the predominant operating mode for that vehicle.

(iv) *Solar panels* means the external installation of horizontally-oriented solar panels, with direct and unimpeded solar exposure to an overhead sun, on an electric vehicle, a plug-in hybrid electric vehicle, a fuel cell vehicle, or a hybrid electric vehicle, such that the solar energy is used to provide energy to the electric drive system of the vehicle by charging the battery or directly providing power to the electric motor or to essential vehicle systems (e.g., cabin heating or cooling/ventilation). The rated power of the solar panels used to determine the credit value must be determined under the standard test conditions of 1,000 W/m<sup>2</sup> direct solar irradiance at a panel temperature of 25 ±2°C with an air mass of 1.5 spectrum (AM1.5).

(v) *Active transmission warmup* means a system that uses waste heat from the vehicle to quickly warm the transmission fluid to an operating temperature range using a heat exchanger, increasing the overall transmission efficiency by reducing parasitic losses associated with the transmission fluid, such as losses related to friction and fluid viscosity.

(vi) *Active engine warmup* means a system that uses waste heat from the vehicle to warm up targeted parts of the engine so that it reduces engine friction losses and enables the closed-loop fuel control more quickly. It allows a faster transition from cold operation to warm operation, decreasing CO<sub>2</sub> emissions, and increasing fuel economy.

(vii) *Waste heat recovery* means a system that captures heat that would otherwise be lost through the engine, exhaust system, or the radiator or other sources and converting that heat to electrical energy that is used to meet the electrical requirements of the vehicle or used to augment the warming of other load reduction technologies (e.g., cabin warming, active engine or transmission warm-up technologies). The

amount of energy recovered is the average value over 5-cycle testing.

(viii) *Active seat ventilation* means a device which draws air, pushes or forces air, or otherwise transfers heat from the seating surface which is in contact with the seat occupant and exhausts it to a location away from the seat. At a minimum, the driver and front passenger seat must utilize this technology for a vehicle to be eligible for credit.

(ix) *Solar reflective surface coating* means a vehicle paint or other surface coating which reflects at least 65 percent of the impinging infrared solar energy, as determined using ASTM standards E903, E1918-06, or C1549-09 (incorporated by reference in §86.1). The coating must be applied at a minimum to all of the approximately horizontal surfaces of the vehicle that border the passenger and luggage compartments of the vehicle, (e.g., the rear deck lid and the cabin roof).

(x) *Passive cabin ventilation* means ducts, devices, or methods which utilize convective airflow to move heated air from the cabin interior to the exterior of the vehicle.

(xi) *Active cabin ventilation* means devices which mechanically move heated air from the cabin interior to the exterior of the vehicle.

(xii) *Electric heater circulation system* means a system installed in a vehicle equipped with an engine idle start-stop system that continues to circulate heated air to the cabin when the engine is stopped during a stop-start event. This system must be calibrated to keep the engine off for a minimum of one minute when the external ambient temperature is 30°F and when cabin heating is enabled.

(c) *Technology demonstration using EPA 5-cycle methodology*. To demonstrate an off-cycle technology and to determine a CO<sub>2</sub> credit using the EPA 5-cycle methodology, the manufacturer shall determine the off-cycle city/highway combined carbon-related exhaust emissions benefit by using the EPA 5-cycle methodology described in 40 CFR Part 600. This method may not be used for technologies that include elements (e.g., driver-selectable systems) that require additional analyses, data collection, projections, or modeling, or

other assessments to determine a national average benefit of the technology. Testing shall be performed on a representative vehicle, selected using good engineering judgment, for each model type for which the credit is being demonstrated. The emission benefit of a technology is determined by testing both with and without the off-cycle technology operating. If a specific technology is not expected to change emissions on one of the five test procedures, the manufacturer may submit an engineering analysis to the EPA that demonstrates that the technology has no effect. If EPA concurs with the analysis, then multiple tests are not required using that test procedure; instead, only one of that test procedure shall be required—either with or without the technology installed and operating—and that single value will be used for all of the 5-cycle weighting calculations. Multiple off-cycle technologies may be demonstrated on a test vehicle. The manufacturer shall conduct the following steps and submit all test data to the EPA.

(1) Testing without the off-cycle technology installed and/or operating. Determine carbon-related exhaust emissions over the FTP, the HFET, the US06, the SC03, and the cold temperature FTP test procedures according to the test procedure provisions specified in 40 CFR part 600 subpart B and using the calculation procedures specified in § 600.113-12 of this chapter. Run each of these tests a minimum of three times without the off-cycle technology installed and operating and average the per phase (bag) results for each test procedure. Calculate the 5-cycle weighted city/highway combined carbon-related exhaust emissions from the averaged per phase results, where the 5-cycle city value is weighted 55% and the 5-cycle highway value is weighted 45%. The resulting combined city/highway value is the baseline 5-cycle carbon-related exhaust emission value for the vehicle.

(2) Testing with the off-cycle technology installed and/or operating. Determine carbon-related exhaust emissions over the US06, the SC03, and the cold temperature FTP test procedures according to the test procedure provisions specified in 40 CFR part 600 sub-

part B and using the calculation procedures specified in § 600.113-12 of this chapter. Run each of these tests a minimum of three times with the off-cycle technology installed and operating and average the per phase (bag) results for each test procedure. Calculate the 5-cycle weighted city/highway combined carbon-related exhaust emissions from the averaged per phase results, where the 5-cycle city value is weighted 55% and the 5-cycle highway value is weighted 45%. Use the averaged per phase results for the FTP and HFET determined in paragraph (c)(1) of this section for operation without the off-cycle technology in this calculation. The resulting combined city/highway value is the 5-cycle carbon-related exhaust emission value including the off-cycle benefit of the technology but excluding any benefit of the technology on the FTP and HFET.

(3) Subtract the combined city/highway value determined in paragraph (c)(1) of this section from the value determined in paragraph (c)(2) of this section and round to the nearest 0.1 grams/mile. The result is the off-cycle benefit of the technology or technologies being evaluated, subject to EPA approval.

(4) Submit all test values to EPA, and include an engineering analysis describing the technology and how it provides off-cycle emission benefits. EPA may request additional testing if we determine that additional testing would be likely to provide significantly greater confidence in the estimates of off-cycle technology benefits.

(d) *Technology demonstration using alternative EPA-approved methodology.* (1) This option may be used only with EPA approval, and the manufacturer must be able to justify to the Administrator why the 5-cycle option described in paragraph (c) of this section insufficiently characterizes the effectiveness of the off-cycle technology. In cases where the EPA 5-cycle methodology described in paragraph (c) of this section cannot adequately measure the emission reduction attributable to an off-cycle technology, the manufacturer may develop an alternative approach. Prior to a model year in which a manufacturer intends to seek these credits,

the manufacturer must submit a detailed analytical plan to EPA. The manufacturer may seek EPA input on the proposed methodology prior to conducting testing or analytical work, and EPA will provide input on the manufacturer's analytical plan. The alternative demonstration program must be approved in advance by the Administrator and should:

(i) Use modeling, on-road testing, on-road data collection, or other approved analytical or engineering methods;

(ii) Be robust, verifiable, and capable of demonstrating the real-world emissions benefit with strong statistical significance;

(iii) Result in a demonstration of baseline and controlled emissions over a wide range of driving conditions and number of vehicles such that issues of data uncertainty are minimized;

(iv) Result in data on a model type basis unless the manufacturer demonstrates that another basis is appropriate and adequate.

(2) *Notice and opportunity for public comment.* The Administrator will publish a notice of availability in the FEDERAL REGISTER notifying the public of a manufacturer's proposed alternative off-cycle credit calculation methodology. The notice will include details regarding the proposed methodology, but will not include any Confidential Business Information. The notice will include instructions on how to comment on the methodology. The Administrator will take public comments into consideration in the final determination, and will notify the public of the final determination. Credits may not be accrued using an approved methodology until the first model year for which the Administrator has issued a final approval.

(3) With respect to fuel consumption improvement values applicable to the determination of average fuel economy under 600.510-12(c)(3) for the 2017 and later model years, EPA will consult with the U.S. Department of Transportation, National Highway Traffic Safety Administration, prior to making a decision on a manufacturer's application submitted under the requirements of this paragraph (d).

(e) *Review and approval process for off-cycle credits.* (1) *Initial steps required.* (i)

A manufacturer requesting off-cycle credits under the provisions of paragraph (c) of this section must conduct the testing and/or simulation described in that paragraph.

(ii) A manufacturer requesting off-cycle credits under the provisions of paragraph (d) of this section must develop a methodology for demonstrating and determining the benefit of the off-cycle technology, and carry out any necessary testing and analysis required to support that methodology.

(iii) A manufacturer requesting off-cycle credits under paragraphs (b), (c), or (d) of this section must conduct testing and/or prepare engineering analyses that demonstrate the in-use durability of the technology for the full useful life of the vehicle.

(2) *Data and information requirements.* The manufacturer seeking off-cycle credits must submit an application for off-cycle credits determined under paragraphs (c) and (d) of this section. The application must contain the following:

(i) A detailed description of the off-cycle technology and how it functions to reduce CO<sub>2</sub> emissions under conditions not represented on the FTP and HFET.

(ii) A list of the vehicle model(s) which will be equipped with the technology.

(iii) A detailed description of the test vehicles selected and an engineering analysis that supports the selection of those vehicles for testing.

(iv) All testing and/or simulation data required under paragraph (c) or (d) of this section, as applicable, plus any other data the manufacturer has considered in the analysis.

(v) For credits under paragraph (d) of this section, a complete description of the methodology used to estimate the off-cycle benefit of the technology and all supporting data, including vehicle testing and in-use activity data.

(vi) An estimate of the off-cycle benefit by vehicle model and the fleetwide benefit based on projected sales of vehicle models equipped with the technology.

(vii) An engineering analysis and/or component durability testing data or



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whole vehicle testing data demonstrating the in-use durability of the off-cycle technology components.

(3) *EPA review of the off-cycle credit application.* Upon receipt of an application from a manufacturer, EPA will do the following:

(i) Review the application for completeness and notify the manufacturer within 30 days if additional information is required.

(ii) Review the data and information provided in the application to determine if the application supports the level of credits estimated by the manufacturer.

(iii) For credits under paragraph (d) of this section, EPA will make the application available to the public for comment, as described in paragraph (d)(2) of this section, within 60 days of receiving a complete application. The public review period will be specified as 30 days, during which time the public may submit comments. Manufacturers may submit a written rebuttal of comments for EPA consideration or may revise their application in response to comments. A revised application should be submitted after the end of the public review period, and EPA will review the application as if it was a new application submitted under this paragraph (e)(3).

(4) *EPA decision.* (i) For credits under paragraph (c) of this section, EPA will notify the manufacturer of its decision within 60 days of receiving a complete application.

(ii) For credits under paragraph (d) of this section, EPA will notify the manufacturer of its decision after reviewing and evaluating the public comments. EPA will make the decision and rationale available to the public.

(iii) EPA will notify the manufacturer in writing of its decision to approve or deny the application, and will provide the reasons for the decision. EPA will make the decision and rationale available to the public.

(f) *Calculation of total off-cycle credits.* Total off-cycle credits in Megagrams of CO<sub>2</sub> (rounded to the nearest whole number) shall be calculated separately for passenger automobiles and light trucks according to the following formula:

$$\text{Total Credits (Megagrams)} = (\text{Credit} \times \text{Production} \times \text{VLM}) \div 1,000,000$$

Where:

Credit = the credit value in grams per mile determined in paragraph (d)(1), (d)(2) or (d)(3) of this section.

Production = The total number of passenger automobiles or light trucks, whichever is applicable, produced with the off-cycle technology to which the credit value determined in paragraph (b), (c), or (d) of this section applies.

VLM = vehicle lifetime miles, which for passenger automobiles shall be 195,264 and for light trucks shall be 225,865.

[77 FR 63170, Oct. 15, 2012]

§ 86.1870-12 CO<sub>2</sub> credits for qualifying full-size pickup trucks.

Full-size pickup trucks may be eligible for additional credits based on the implementation of hybrid technologies or on exhaust emission performance, as described in this section. Credits may be generated under either paragraph (a) or (b) of this section for a qualifying pickup truck, but not both.

(a) *Credits for implementation of hybrid electric technology.* Full size pickup trucks that implement hybrid electric technologies may be eligible for an additional credit under this paragraph (a). Pickup trucks earning the credits under this paragraph (a) may not earn the credits described in paragraph (b) of this section. To claim this credit the manufacturer must measure the recovered energy over the Federal Test Procedure according to § 600.116-12(c) to determine whether a vehicle is a mild or strong hybrid electric vehicle. To provide for EPA testing, the vehicle must be able to broadcast battery pack voltage via an on-board diagnostics parameter ID channel.

(1) Full size pickup trucks that are mild hybrid electric vehicles and that are produced in the 2017 through 2021 model years are eligible for a credit of 10 grams/mile. To receive this credit in a model year, the manufacturer must produce a quantity of mild hybrid electric full size pickup trucks such that the proportion of production of such vehicles, when compared to the manufacturer's total production of full size pickup trucks, is not less than the amount specified in the table below for that model year.