

December 9,2022

Mr. Linc Wehrly (sent via email) Compliance Division Light-Duty Vehicle Center Office of Transportation and Air Quality United States Environmental Protection Agency 2565 Plymouth Road Ann Arbor, Michigan 48105

Mr. Maurice Hicks (sent via email) Fuel Economy Division Chief Office of Rulemaking National Highway Traffic Safety Administration 1200 New Jersey Avenue SE Washington, DC 20590

RE: Off-Cycle Credit Request for Advanced Vehicle Lighting Tehnologies

Dear Mr. Wehrly and Mr. Hicks and Mr. Nguyen:

FCA respectfully submits this application for off-cycle credits under the provisions of 40 CFR § 86.1869-12(d), EPA's off-cycle program beginning with the 2023 Model Year.

EPA's off-cycle program allows manufacturers to seek agency approval to use an alternative methodology for determining off-cycle CO₂ credits. This option is available to manufacturers if the technology benefit is not adequately demonstrated using the 5 cycle test methodology or if the benefit differs from the list of predetermined credit values for a technology.

The advanced lighting technology benefit cannot be determined by 5 cycle testing and the predetermined credit value for advanced lighting technologies is lower than what FCA has developed and deployed in its fleet. FCA selected a methodology consistent with past credit applications from Ford and Mazda (decision document EPA-420-R-22-010) and submits the off-cycle credit request previously approved by EPA and NHTSA.

The methodology description and details fulfilling the off-cycle alternative methodology requirements are given in Attachment A. As a previously accepted methodology, FCA requests that the notice and comment requirements be waived as allowed in 40 CFR § 86.1869-12(d)(2)(ii). The 3 conditions for waiver are given in Attachment B.

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Thank you for your consideration of this application for off-cycle greenhouse gas credits. If you have any questions, please feel free to contact Pete Mueller at 248-736-9077 or send an email to Pete.Mueller@FCAGroup.com.

Very Best Regards,

Steve Mazure

Steven Mazure Manager, Regulatory Development Tehnical Safety and Regulatory Compliance

Attachment A:	Advanced Lighting Credit Off-Cycle Methodology Details (Contains Confidential Business Information)
Attachment B:	Notice and Comment Waiver Requirements for Off-Cycle Methodologies
cc:	David Wright, Wright.DavidA@epa.gov (sent via email) Joel Dalton, Dalton.Joel@epa.gov (sent via email) John Nguyen, CARB (sent via email)

Attachment A-Advanced Vehicle Lighting Technology Benefits of LED Lighting Systems

Advanced Vehicle Lighting Technologies

Advanced Vehicle Lighting Technologies are high efficiency lighting systems that reduce the overall electrical demand of the lighting system over a baseline system comprised of conventional lighting elements.

The predefined list of credits, on a per-bulb basis, are valued based on an assumed reduction in electrical power for that bulb. The reduction in power on a wattage basis between the advanced system and the baseline system determine the credit level. The maximum credit level determined by the predefined list of credits is 1.0 g/mi of CO2.

FCA Advanced Vehicle Lighting System Description

FCA uses energy efficient light emitting diode ("LED") lamps. LED lamps are increasingly being used to replace conventional bulbs based on incandescent (resistive) lamp technology. LED lighting technologies have greater up-front costs for our customers but are a good value proposition when it comes to current consumption and a lamp life many times greater than incandescent technology.

Vehicle adoption of LED technology follows certain price points. Higher level trim package pricing allows greater adoption of LED lighting technology. Base models have lower adoption levels of LED lighting where the cost of adoption is high relative to the price point of the vehicle. Some vehicle programs in the FCA fleet will have 3 levels of adoption from low to mid to high.

Vehicles credit levels due to the advanced vehicle lighting system, where greater than the menu credit, will be tallied in the table below.

FCA Credit Methodology

The FCA fleet shows greater bulb power reductions than those given by the predefined credit list. The methodology for evaluating the benefits of the advanced lighting system is taken from the *Joint Technical Support Document: Final Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards* ("TSD"), EPA 420-R-12-901, August 2012, Section 5.2.3, pages 5-69 to 5-72.

The FCA methodology is identical to the Ford and Mazda methodologies approved by EPA and based on the TSD. Ford submitted their request the TSD in March 2015 and resubmitted again in January 2016 to cover later model years. Mazda submitted their application based on the TSD methodology in March 2022. EPA granted approval for the methodology with the release of Decision Document EPA-420-R-22-010.

FCA uses LED lighting technology in different vehicle positions:

- Low beam
- Parking/Position
- Front side marker
- Tail lights

- High beam
- Rear turn signal
- Rear side marker
- License plate marker

The credits FCA is requesting are calculated by using the formula given by EPA in the TSD on page 5-72:

High Efficiency Exterior Lighting Credit =

 $\frac{(Baseline - High \, Efficiency) \, Lighting \, Wattage \, x \, Usage \, Rate \, x \, VMT \, Fraction \, x \, 3.2 \, \frac{g}{mi} CO2}{100 \, Watts}$

Baseline wattage is defined as the component wattage of incandescent lamps prior to the change to LED lighting. Usage rate is taken from Table 5-21 per bulb and separates day and night usage. VMT fraction is given on page 5-72 for system nighttime usage.

Baseline Lighting Wattage

FCA has used a combination of halogen and incandescent bulbs in its systems. The bulb wattages in Table 5-21 given in the TSD are appropriate to use as baseline for this request. Power consumption of these lamps in the past mirror those given in the table.

FCA LED Credit Calculation

Table 1 summarizes the LED lamp attributes for two vehicles in the FCA fleet. Considering the values provided by the TSD in table 5-21 and substituting FCA-specific LED power consumption values into the formula yields Table 2 below. The 22MY Ram 1500 light duty pickup truck and the 22MY Grand Cherokee both make extensive use of LED lamps. Table 2 summarizes the expected credit for those vehicles by bulb position using the formula given by the TSD and copied above.

As additional data becomes available for other vehicle lines FCA will calculate the credit according to this methodology. Vehicles taking advantage of this methodology will show their calculations during the model year report submission.



Table 1. LED bulb wattages for select vehicles in the FCA fleet.



Table 2. Credits calculated according to the method given in the TSD based on LED bulb wattages in Table 1.

Attachment B-Notice and Comment Waiver Requirements of 40 CFR § 86.1869-12(d)(2)(ii)

The qualifications for the notice and comment waiver are that the new application must be virtually identical in form, content and especially methodology to previously approved methodologies on prior applications. Three additional requirements, in addition to the requirements above, need to be discussed per 40 CFR § 86.1869-12(d)(2)(ii):

- (A) A citation to the appropriate previously approved methodology, including the appropriate FEDERAL REGISTER Notice and any subsequent EPA documentation of the Administrator's decision,
- (B) All necessary manufacturer- and vehicle-specific test data, modeling, and credit calculations; and,
- (C) Any other vehicle- or technology-specific details required pursuant to the previously approved methodology to assess and support an appropriate credit value.

First Requirement-Previously Approved Methodology Citations

Both Ford and Mazda have had this methodology approved in the past. Ford's applications date back to 2015 for certain model years and 2016 for additional model years in the future. Mazda's application is more recent, being submitted in December of 2020 and approved in May 2022.

The two Ford applications were submitted and approved prior to the EPA Decision Document format. The Ford applications and decisions are documented on EPA's webpage devoted to Ford Compliance Materials for Light-Duty Greenhouse Gas (GHG) Standards:

https://www.epa.gov/ve-certification/ford-compliance-materials-light-duty-greenhouse-gas-ghgstandards

The specific requests/approvals are shown here:

https://www.epa.gov/sites/production/files/2016-09/documents/ford-request-2012-2013-ghg-credits-2015-03-20.pdf

https://nepis.epa.gov/Exe/ZyPDF.cgi/P100N19E.PDF?Dockey=P100N19E.PDF

https://www.epa.gov/sites/production/files/2016-09/documents/ford-request-2009-thru-2011-2014-ghg-credits-2016-01-29.pdf

The Mazda application refers to the Ford 2015 application above and is found here:

https://www.epa.gov/system/files/documents/2022-05/mazda-ghg-credit-high-effcy-extr-light-tech-apl-2020-12-21.pdf

The EPA Decision Document (May 2022, EPA-420-R-22-010) is found here:

https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1014RWG.pdf

Second Requirement-Manufacturer and Vehicle-Specific Data

Test data related to each individual LED lamp is available for review with FCA engineering upon the agencies' request. FCA provided a sample of vehicle information using the Ram 1500 light duty pickup truck and the Jeep Grand Cherokee SUV. FCA is evaluating other vehicles in the fleet for which we have LED data, which will be provided in entirety as part of the 23MY GHG submission if EPA approves the methodology usage for FCA.

The bulb data and credit calculations based on the bulb data are given in Tables 1 and 2 in Attachment A.

Third Requirement-Other Vehicle- or Technology-Specifics

No other information is required as the specific bulb data is supplied as part of the second requirement and the methodology is identical as previously approved applications.