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40 C.F.R. § 600.116-12

Special procedures related to electric vehicles and hybrid electric vehicles.

(a) Determine fuel economy values for electric vehicles as specified in §§ 600.210 and 600.311 using the procedures of SAE J1634 (incorporated by reference in § 600.011). Use the procedures of SAE J1634, Section 8, with the following clarifications and modifications for using this and other sections of SAE J1634:

(1) Vehicles that cannot complete the Multi-Cycle Range and Energy Consumption Test (MCT) because they are unable travel the distance required to complete the test with a fully charged battery, or they are unable to achieve the maximum speed on either the UDDS or HFEDS (Highway Fuel Economy Drive Cycle also known as the HFET) cycle should seek Administrator approval to use the procedures outlined in SAE J1634 Section 7 Single Cycle Range and Energy Consumption Test (SCT).

(2) The MCT includes the following key-on soak times and key-off soak periods:

(i) As noted in SAE J1634 Section 8.3.4, a 15 second key-on pause is required between $UDDS_1$ and $HFEDS_1$, and $UDDS_3$ and $HFEDS_2$.

(ii) As noted in SAE J1634 Section 8.3.4, a 10-minute key-off soak period is required between $HFEDS_1$ and $UDDS_2$, and $HFEDS_2$ and $UDDS_4$.

(iii) A key-off soak period up to 30 minutes may be inserted between $UDDS_2$ and the first phase of the mid-test constant speed cycle, between $UDDS_4$ and the first phase of the end-of-test constant speed cycle, and between the end of the mid-test constant speed cycle and $UDDS_3$. Start the next test segment immediately if there is no key-off soak between test segments.

(iv) If multiple phases are required during either the mid-test constant speed cycle or the end-of-test constant speed cycle there must be a 5-minute to 30-minute key-off soak period between each constant speed phase as noted in SAE J1634 Section 6.6.

(3) As noted in SAE J1634 Section 8.3.4, during all `key-off' soak periods, the key or power switch must be in the "off" position, the hood must be closed, the test cell fan(s) must be off, and the brake pedal not depressed. For vehicles which do not have a key or power switch the vehicle must be placed in the `mode' the manufacturer recommends when the vehicle is to be parked and the occupants exit the vehicle.

(4) Manufacturers may determine the mid-test constant speed cycle distance (d_M) using their own methodology and good engineering judgment. Otherwise, either Method 1 or Method 2 described in Appendix A of SAE J1634 may be used to estimate the mid-test constant speed cycle distance (d_M). The mid-test constant speed cycle distance calculation needs to be performed prior to beginning the test and should not use data from the test being performed. If Method 2 is used, multiply the result determined by the Method 2 equation by 0.8

to determine the mid-test constant speed cycle distance (d_M).

(5) Divide the mid-test constant speed cycle distance (d_M) by 65 mph to determine the total time required for the mid-test constant speed cycle. If the time required is one hour or less, the mid-test constant speed cycle can be performed with no key-off soak periods. If the time required is greater than one hour, the mid-test constant speed cycle must be separated into phases such that no phase exceeds more than one hour. At the conclusion of each mid-test constant speed phase, except at the conclusion of the mid-test constant speed cycle, perform a 5-minute to 30-minute key-off soak. A key-off soak period up to 30 minutes may be inserted between the end of the mid-test constant speed cycle and $UDDS_3$.

(6) Using good engineering judgment determine the end-of-test constant speed cycle distance so that it does not exceed 20% of the total distance driven during the MCT as described in SAE J1634 Section 8.3.3.

(7) Divide the end-of-test constant speed cycle distance (d_E) by 65 mph to determine the total time required for the end-of-test constant speed cycle. If the time required is one-hour or less the end-of-test constant speed cycle can be performed with no key-off soak periods. If the time required is greater than one-hour the end-of-test constant speed cycle must be separated into phases such that no phase exceeds more than one-hour. At the conclusion of each end-of-test constant speed phase, perform a 5-minute to 30-minute key-off soak.

(8) SAE J1634 Section 3.13 defines useable battery energy (UBE) as the total DC discharge energy (Edc_{total}), measured in DC watt-hours for a full discharge test. The total DC discharge energy is the sum of all measured phases of a test inclusive of all drive cycle types. As key-off soak periods are not considered part of the test phase, the discharge energy that occurs during the key-off soak periods is not included in the useable battery energy.

(9) Recharging the vehicle's battery must start within three hours after the end of testing.

(10) At the request of a manufacturer, the Administrator may approve the use of an earlier version of SAE J1634 when a manufacturer is carrying over data for vehicles tested using a prior version of SAE J1634.

(11) All label values related to fuel economy, energy consumption, and range must be based on 5-cycle testing or on values adjusted to be equivalent to 5-cycle results. Prior to performing testing to generate a 5-cycle adjustment factor, manufacturers must request Administrator approval to use SAE J1634 Appendices B and C for determining a 5-cycle adjustment factor with the following modifications, clarifications, and attestations: