

percent of tank fuel capacity (total capacity of both tanks when the vehicle is equipped with dual fuel tanks) shall be determined from the fuel economy on the UDDS applicable to the test vehicle and from the number of gallons to the nearest 0.1 gallon (0.38 liter) that constitutes 85 percent of tank volume. If this "fuel consumed point" occurs partway through a UDDS cycle, the cycle shall be completed in its entirety.

(iv) The vehicle shall be driven at a speed not to exceed 25 mph from the test track to the laboratory provided the distance from the test track to the laboratory does not exceed 5 miles (8.05 km). If the distance from the test track to the emission laboratory is greater than 5 miles (8.05 km) the vehicle shall be moved from the test track with the engine off.

(v) For vehicles equipped with dual fuel tanks, fuel switching from the first tank to the second tank shall occur at the 10 percent volume of the first tank regardless of the point in the UDDS cycle at which this occurs.

(vi) If necessary to accommodate work schedules, the engine may be turned off and the vehicle parked on the test track. The vehicle may be parked off of the test track to facilitate maintenance or repairs if required. If the vehicle is moved from the test track, it shall be returned to the track with the engine off when mileage accumulation is to be resumed.

(3) *Drive schedule for partial refueling test.* The Administrator may conduct a partial refueling test involving a shortening of the drive procedures described in paragraphs (d) (1) and (2) of this section and a modified soak and refueling procedure as described in paragraph (e) of this section and § 86.154-98(e)(7)(i). The drive shall be performed as described in paragraph (d) (1) or (2) of this section except that the drive shall be terminated when at least 10 percent but no more than 85 percent of the fuel tank nominal capacity has been consumed and not partway through a UDDS cycle. The amount of fuel consumed in the drive shall be determined by multiplying the number of UDDSs driven by the mileage accumulated per UDDS and dividing by the fuel econ-

omy for the UDDS applicable to the test vehicle.

(e) *Vehicle cool down*—(1) *Partial refueling test.* If the Administrator is conducting the non-integrated system partial refueling test, after the driving procedure specified in paragraph (d)(3) of this section, the vehicle shall be parked (without starting the engine) and soaked at  $80\pm 3$  °F ( $27\pm 1.7$  °C) for a minimum of 1 hour and a maximum of 6 hours.

(2) *For all other refueling emission tests.* Within 10 minutes of completion of refueling emissions canister stabilization (see paragraph (c) or (d) of this section), the refueling emissions canister(s) shall be disconnected, unless the manufacturer specifies that the refueling canister(s) should not be disconnected. Within 60 minutes of completion of refueling emissions canister stabilization (see paragraph (c) or (d) of this section), the vehicle fuel tank(s) shall be drained, the fuel tank(s) fueled to 10 percent of nominal tank capacity determined to the nearest one-tenth of a U.S. gallon (0.38 liter) with the specified fuel, and the vehicle parked (without starting the engine) and soaked at  $80\pm 3$  °F ( $27\pm 1.7$  °C) for a minimum of 6 hours and a maximum of 24 hours.

[59 FR 16298, Apr. 6, 1994, as amended at 60 FR 43898, Aug. 23, 1995; 70 FR 72927, Dec. 8, 2005; 79 FR 23698, Apr. 28, 2014]

**§ 86.154-98 Measurement procedure; refueling test.**

(a) The refueling test measurement procedure described in this section immediately follows the vehicle and canister preconditioning described in § 86.153-98.

(b) The refueling emission enclosure shall be purged for several minutes immediately prior to the test. Warning: If at any time the concentration of hydrocarbons, of methanol, or of methanol and hydrocarbons exceeds 15,000 ppm C, the enclosure should be immediately purged. This concentration provides a 4:1 safety factor against the lean flammability limit.

(c)(1) The FID (or HFID) hydrocarbon analyzer, and additional analyzer, if needed, shall be zeroed and spanned immediately prior to the test.

(2) For methanol-fueled vehicles only, impingers charged with known

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volumes of pure deionized water shall be placed in the methanol sampling system.

(d) If not already on, the enclosure mixing fan and the spilled fuel mixing blower shall be turned on at this time.

(e) The refueling emission measurement portion of the refueling test shall be performed as follows:

(1) The line from the fuel tank(s) to the refueling emissions canister(s) shall be connected.

(2) The test vehicle, with the engine shut off, shall be moved into the enclosure. The test vehicle windows and luggage compartment shall be opened if not already open.

(3) An electrical ground shall be attached to the vehicle. The vehicle fuel filler cap shall be removed and the enclosure door shall be closed and sealed within two minutes of cap removal. The FID (or HFID) trace shall be allowed to stabilize.

(4) The dispensed fuel temperature recording system shall be started.

(5)(i) Within 10 minutes of closing and sealing the doors, analyze enclosure atmosphere for hydrocarbons and record. This is the initial (time=0 minutes) hydrocarbon concentration,  $C_{HCl}$ , required in § 86.143-96.

(ii) For methanol-fueled vehicles only, measure the initial concentration of methanol as described in § 86.133-96(i)(6).

(6) Within one minute of obtaining the initial FID (or HFID) reading, and methanol reading if applicable, the fuel nozzle shall be inserted into the filler neck of the test vehicle, to its maximum penetration, and the refueling operation shall be started. The plane of the nozzle's handle shall be approximately perpendicular to the floor of the laboratory. The fuel shall be dispensed at a temperature of  $67 \pm 1.5$  °F ( $19.4 \pm 0.8$  °C) and at a dispensing rate of  $9.8 \pm 0.3$  gal/min ( $37.1 \pm 1.1$  liter/min). In testing conducted by the Administrator, a lower dispensing rate (no lower than 4.0 gal/min (15.1 liter/min)) may be used.

(7)(i) *Partial refueling test.* If the Administrator conducts the non-integrated system partial refueling test, the fuel flow shall continue until the amount of fuel pumped is equal to the fuel consumed during the driving, as

determined in accordance with § 86.153-98(d)(3). The final volume of fuel dispensed must be within one-tenth of a U.S. gallon (0.38 liter) of the targeted amount. If automatic nozzle shut-off occurs prior to this point, the nozzle shall be reactivated within 15 seconds and fuel dispensing continued as needed. A minimum of 3 seconds shall elapse between any automatic shutoff and subsequent resumption of dispensing.

(ii) *For all other refueling tests.* The fuel flow shall continue until the refueling nozzle automatic shut-off is activated. The amount of fuel dispensed must be at least 85 percent of nominal fuel tank volume, determined to the nearest one-tenth of a U.S. gallon (0.38 liter). If automatic nozzle shut-off occurs prior to this point, the nozzle shall be reactivated within 15 seconds and fuel dispensing continued as needed. A minimum of 3 seconds shall elapse between any automatic shutoff and subsequent resumption of dispensing. Dispensing may not be manually terminated, unless the test vehicle has already clearly failed the test.

(8)(i) The final reading of the evaporative enclosure FID analyzer shall be taken  $60 \pm 5$  seconds following the final shut-off of fuel flow. This is the final hydrocarbon concentration,  $C_{HCl}$ , required in § 86.143-96. The elapsed time, in minutes, between the initial and final FID (or HFID) readings shall be recorded.

(ii) *For methanol-fueled vehicles only.* Measure the final concentration of methanol as described in § 86.133-96(m)(2).

(9) For vehicles equipped with more than one fuel tank, the procedures described in this section shall be performed for each fuel tank.

[59 FR 16299, Apr. 6, 1994, as amended at 60 FR 43898, Aug. 23, 1995]

### § 86.155-98 Records required; refueling test.

The following information shall be recorded with respect to each test:

- (a) Test number.
- (b) System or device tested (brief description).
- (c) Date and time of day.
- (d) Instrument operated.
- (e) Operator.