

TABLE O–96–2—SETS OF CONDITIONS TO BE EMPLOYED BY THE ADMINISTRATOR IN THE CST—Continued

	Test Option 1	Test Option 2	Test Option 3
	Cold Temperature	Moderate Temperature	Warm Temperature
Ambient temperature	15 °F–25 °F (–9 °C––4 °C)	68 °F–86 °F (20 °C–30 °C) ...	86 °F–96 °F (30 °C–36 °C)

(c) For testing conducted in accordance with this subpart, the ambient temperature to which the test vehicle is exposed must not fall outside the range specified in this paragraph.

(1) *For the cold temperature compliance pathways—(i) For the manufacturer’s data submittal.* The ambient temperature for the steps following the fuel drain and fill or transient test procedure must remain between 15 °F and 25 °F (between –9 °C and –4 °C).

(ii) *For testing by the Administrator.* The ambient temperature for the remainder of the compliance pathway beginning with the step following the fuel drain and fill must remain between 15 °F and 68 °F (between –9 °C and 20 °C). In addition, from the warmup operation step (if performed) or the wait time step forward through the remainder of the CST, the ambient temperature must be maintained within ±5 °F (3 °C) of the selected ambient temperature of the CST.

(2) *For the moderate and warm temperature compliance pathways—(i) For the manufacturer’s data submittal.* The ambient temperature for the steps preceding the warmup operation (if performed) or the wait time (if no warmup is performed) must remain within the specific ambient temperature range selected for the CST, that is, either moderate or warm, as specified in table O–96–1.

(ii) *For testing by the Administrator.* The ambient temperature for the steps preceding the warmup operation (if performed) or the wait time (if no warmup is performed) must remain between 68 °F and 96 °F (between 20 °C and 36 °C), except as provided in paragraph (c)(3) of this section.

(iii) The warmup operation (if performed) and the entire test run from the wait time forward, as described in § 86.1437 or § 86.1438, must remain within the specific ambient temperature range selected for the CST, that is, either

moderate or warm, as specified in tables O–96–1 and O–96–2.

(3) *For testing by the Administrator only.* If Cold CO fuel is selected in conjunction with the moderate temperature compliance pathway, the specific provisions described in paragraphs (c)(3) (i) and (ii) of this section apply.

(i) The ambient temperature must be maintained within the moderate temperature range, as specified in table O–96–2, from the drain and fuel step forward throughout the remainder of the compliance pathway.

(ii) The ambient temperature of the test cell may not exceed 80 °F (27 °C) for the warmup operation (if performed) nor for the entire test run from the wait time forward, as described in §§ 86.1438 and 86.1439.

(d) If the engine stalls at any time during the test run, the CST is void unless the stall falls during the wait time within the guidelines for engine off time described in §§ 86.1437 (b) and (d) and 86.1438(d)(1)(i).

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§ 86.1431 [Reserved]

§ 86.1432 Vehicle preparation.

(a) The test conditions to be employed in the CST procedure must be selected from the applicable options specified in table O–96–1 or table O–96–2 of § 86.1430(b). The fuel tank must be fitted, as required, to accommodate a fuel drain at the lowest point possible in the tank(s) as installed on the vehicle.

(b) *Fuel tank drain and fill, or transient test procedure—(1) CST performed as a stand-alone procedure.* For the first CST compliance pathway performed as a stand-alone procedure on a particular test vehicle, the fuel tank(s) must be filled to approximately the prescribed “tank fuel volume” (as defined in § 86.082–2) with the specified test fuel.

For the cold temperature compliance pathway, the temperature of the fuel prior to its delivery to the fuel tank must be less than or equal to 60 °F (16 °C). If the existing fuel in the fuel tank(s) does not meet the specifications contained in §§86.1413 and 86.1430(b), the existing fuel must be drained prior to the fuel fill as specified above. Other refueling during a CST may not be performed. Draining and refueling between successive CSTs is allowed and is required prior to any CST for which the specified fuel is different than that existing in the tank(s). Any soak or operation that follows this step, until the conclusion of the CST sequence, must occur at an ambient temperature that is within the allowable temperature range described in §86.1430(c).

(2) *CST performed in sequence with other confirmatory testing.* Certain complete confirmatory test procedures, as indicated in paragraphs (b)(2) (i) and (ii) of this section, may be substituted for the vehicle preparation steps described in paragraph (b)(1), (c), and (d) of this section. If the vehicle is to be subjected to one or more of these other confirmatory test procedures, the vehicle is prepared in accordance with the applicable complete procedures from the point of fuel drain and fill.

(i) *Manufacturer's data submittal.* The only test procedure that the manufacturer may select to substitute for paragraphs (b)(1), (c)(1), and (d)(1) of this section for the purposes of its data submittal is the Cold CO Test Procedure, performed in accordance with subpart C of this part.

(ii) *Testing by the Administrator.* The complete confirmatory test sequences that the Administrator may select to substitute for paragraph (b)(1) of this section are listed in paragraphs (b)(2)(ii) (A) through (C) of this section.

(A) Federal Test Procedure for exhaust emissions (except when performing evaporative test sequence) or for fuel economy testing, in accordance with subpart B of this part.

(B) Highway Fuel Economy Test Procedure, in accordance with part 600 of this chapter (which must follow a Federal Test Procedure).

(C) Cold CO Test Procedure, in accordance with subpart C of this part.

(c) *Soak*—(1) *Manufacturer's data submittal.* A vehicle soak prior to the wait time is optional if the CST sequence is performed as a stand-alone procedure. If the manufacturer elects to perform a Cold CO Test Procedure in conjunction with the CST as permitted in paragraph (b)(2) of this section, the soak and subsequent warmup are not conducted, and instead the procedure must move directly to the wait time step described in §86.1437(b). If the test vehicle undergoes a soak period, it must be maintained at an ambient temperature within the temperature range specified in §86.1430(c), for a period not to exceed 36 hours in duration, except as provided in paragraph (d)(1) of this section. Ambient temperature during soak periods must remain within the appropriate temperature range for the selected test option.

(2) *Testing by the Administrator.* (i) The test sequence may proceed directly to the wait time step described in §86.1438(b) within 60 seconds of the end of vehicle operation conducted in accordance with paragraph (b)(2) of this section.

(ii) Optionally, the test vehicle may soak at an ambient temperature within the temperature range specified in §86.1430(c), for a period up to 36 hours in duration, except as provided in paragraph (d)(2) of this section. If the Administrator opts to soak the test vehicle, warmup operation must be performed as described in paragraph (d)(2) of this section.

(d) *Warmup operation*—(1) *Manufacturer's data submittal.* Warmup operation is optional. Warmup consists of loaded operation over the first 505 seconds of the UDDS (in accordance with §86.115 and appendix I to this part), or optionally, if the soak period has exceeded 36 hours, a full UDDS. Warmup operation must occur within the specific ambient temperature range for the selected test option, as given in table O-96-1 of §86.1430.

(2) *Testing by the Administrator.* Warmup operation is performed if no transient operation of the type specified in §86.1432(b)(2) is performed prior to the wait time, or if the optional soak exceeds 60 seconds. Warmup operation consists of, at a minimum, loaded operation over the first 505 seconds of

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the UDDS (in accordance with § 86.115 and appendix I to this part), or, if the soak period has exceeded 36 hours, a full UDDS. Warmup operation must occur within the specific ambient temperature range for the selected test option, as given in table O-96-2 of § 86.1430, except as specified in paragraphs (e)(2)(i) and (ii) of this section. Warmup operation must proceed immediately to the wait time step at § 86.1438(b).

(i) For moderate temperature testing utilizing Cold CO fuel only, the ambient temperature may not exceed 80 °F (27 °C) during warmup operation, or any of the succeeding steps in the CST sequence.

(ii) For the cold temperature pathway only, warmup operation must occur not only within the specific ambient temperature range indicated in table O-96-2 of § 86.1430, but must also occur within 5 °F (3 °C) of the selected test temperature.

§ 86.1433 [Reserved]

§ 86.1434 Equipment preparation.

(a) Immediately prior to the wait time portion of the test run described in § 86.1437 or § 86.1438, or immediately prior to warmup operation, the steps described in paragraphs (b) through (d) of this section must be performed.

(b) Check the device(s) for removing water from the exhaust sample and the sample filter(s). Remove any water from the water trap(s). Clean and replace the filter(s) as necessary.

(c) Set the zero and span points of the analyzer with the electrical spanning network or with analytical gases.

(d) Attach the tachometer to the vehicle in accordance with the analyzer manufacturer's instructions. The manufacturer must ensure, for all test and production vehicles and engines, that the rpm signal is capable of being read by an exhaust gas analyzer via:

(1) A conventional inductive tachometer; or

(2) The onboard diagnostics (OBD) connector, as described under the provisions of § 86.094-17; or

(3) A dedicated electrical lead, marked "rpm" and located under the hood, with a female-type, quarter-inch spade terminal. The digital transistor-

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logic (TTL) signal must span the 0V-5V range at a rate of one pulse per engine revolution, synchronized to the top dead center position.

§§ 86.1435-86.1436 [Reserved]

§ 86.1437 Test run—manufacturer.

(a) This section describes the test run performed by the manufacturer for its data submittal pursuant to obtaining a certificate of conformity under the provisions of § 86.096-23. The test run consists of the wait time, vehicle preconditioning (optional), and the selected test procedure. The entire test run is performed in accordance with the conditions in the option selected from table O-96-1 of § 86.1430.

(b) *Wait time.* (1) If the vehicle is not already idling, the vehicle is started and allowed to idle freely with the transmission in neutral. The vehicle wait time begins when the vehicle engine speed is between 350 and 1100 rpm. The engine speed must attain the specified idle speed within ten seconds of beginning the idle period. A timer for the wait time portion of the test run will initiate (wt=0) when the vehicle is turned on or when it returns to idle after any transient test procedure, as described in § 86.1432.

(2) Following the first three minutes of idle, this wait time may be interrupted by engine off/restart cycles occurring no more frequently than every five minutes, with each engine off period having a maximum duration of two minutes. Each period of idle following a restart must be a minimum of three minutes in duration. During each idle period, the engine speed must not exceed 1100 rpm or fall below 350 rpm for more than five seconds in any one excursion. The total duration of the wait time, including time at idle and time during engine off periods, is 25 to 30 minutes.

(c) *Optional preconditioning.* Immediately following the wait time, the engine speed is increased to 2500±300 rpm for 25 to 30 seconds or, optionally, the vehicle will undergo loaded operation for a minimum of 30 seconds between the speeds of 30 and 50 mph (48 to 80 kph). The period allowed for preconditioning commences upon attaining the specified rpm or speed range. No more