

§ 1066.420

40 CFR Ch. I (7–1–13 Edition)

(3) If the cooling specifications in this paragraph (b) are impractical for special vehicle designs, such as vehicles with rear-mounted engines, you may arrange for an alternative fan configuration that allows for proper simulation of vehicle cooling during in-use operation, subject to our approval.

(c) Record the vehicle's speed trace based on the time and speed data from the dynamometer. Record speed to at least the nearest 0.01 m/s or 0.1 mph and time to at least the nearest 0.1 s.

(d) You may perform practice runs for operating the vehicle and the dynamometer controls to meet the driving tolerances specified in §1066.430 or adjust the emission sampling equipment. Verify that the accelerator pedal allows for enough control to closely follow the prescribed driving schedule. You may not measure emissions during a practice run.

(e) Inflate the drive wheel tires according to the vehicle manufacturer's specifications. The drive wheels' tire pressure must be the same for dynamometer operation and for coastdown procedures for determining road-load coefficients. Report these tire pressure values with the test results.

(f) For vehicles with GVWR above 14,000 lbs, you must use a vehicle pull down mechanism that allows simulation of the actual normal forces that the tire and dynamometer roll interface would see if a loaded vehicle were actually being tested. Use of this mechanism will ensure that wheel slip does not occur when trying to accelerate the loaded vehicle.

(g) Use good engineering judgment when testing vehicles in four-wheel drive or all-wheel drive mode. This may involve testing on a dynamometer with a separate dynamometer roll for each drive axle. This may also involve operation on a single roll, which may require disengaging the second set of drive wheels, either with a switch available to the driver or by some other means; however, operating such a vehicle on a single roll may occur only if this does not decrease emissions or energy consumption relative to normal in-use operation. Alternatively, for heavy-duty motor vehicles, up to two drive axles may use a single drive roll, as described in §1066.210(d)(2).

(h) Warm up the dynamometer as recommended by the dynamometer manufacturer.

(i) Following the test, determine the actual driving distance by counting the number of dynamometer roll or shaft revolutions, or by integrating speed over the course of testing from a high-resolution encoder system.

§ 1066.420 Pre-test verification procedures and pre-test data collection.

(a) Follow the procedures for PM sample preconditioning and tare weighing as described in 40 CFR 1065.590 if your engine must comply with a PM standard.

(b) Unless the standard-setting part specifies different tolerances, verify at some point before the test that ambient conditions are within the tolerances specified in this paragraph (b). For purposes of this paragraph (b), "before the test" means any time from a point just prior to engine starting (excluding engine restarts) to the point at which emission sampling begins.

(1) Ambient temperature must be (20 to 30) °C. See §1066.430(m) for circumstances under which ambient temperatures must remain within this range during the test.

(2) Atmospheric pressure must be (80.000 to 103.325) kPa. You are not required to verify atmospheric pressure prior to a hot-start test interval for testing that also includes a cold start.

(3) Dilution air conditions must meet the specifications in 40 CFR 1065.140, except in cases where you preheat your CVS before a cold-start test. We recommend verifying dilution air conditions just before starting each test phase.

(c) You may test vehicles at any intake-air humidity.

(d) You may perform a final calibration of proportional-flow control systems, which may include performing practice runs.

(e) You may perform the following procedure to precondition sampling systems:

(1) Operate the vehicle over the test cycle.

(2) Operate any dilution systems at their expected flow rates. Prevent aqueous condensation in the dilution systems.

(3) Operate any PM sampling systems at their expected flow rates.

(4) Sample PM for at least 10 min using any sample media. You may change sample media during preconditioning. You must discard preconditioning samples without weighing them.

(5) You may purge any gaseous sampling systems during preconditioning.

(6) You may conduct calibrations or verifications on any idle equipment or analyzers during preconditioning.

(7) Proceed with the test sequence described in § 1066.430.

(f) Verify the amount of nonmethane hydrocarbon (or equivalent) contamination in the exhaust and background HC sampling systems within 8 hours before the start of the first test drive cycle for each individual vehicle tested as described in 40 CFR 1065.520(g).

§ 1066.425 Engine starting and restarting.

(a) Start the vehicle's engine as follows:

(1) At the beginning of the test cycle, start the engine according to the procedure you describe in your owners manual. In the case of hybrid vehicles, this would generally involve activating vehicle systems such that the engine will start when the vehicle's control algorithms determine that the engine should provide power instead of or in addition to power from the rechargeable energy storage system (RESS). Unless we specify otherwise, engine starting throughout this part generally refers to this step of activating the system on hybrid vehicles, whether or not that causes the engine to start running.

(2) Place the transmission in gear as described by the test cycle in the standard-setting part. During idle operation, you may apply the brakes if necessary to keep the drive wheels from turning.

(b) If the vehicle does not start after your recommended maximum cranking time, wait and restart cranking according to your recommended practice. If you don't recommend such a cranking procedure, stop cranking after 10 seconds, wait for 10 seconds, then start cranking again for up to 10 seconds. You may repeat this for up to three start

attempts. If the vehicle does not start after three attempts, you must determine and record the reason for failure to start. Shut off sampling systems and either turn the CVS off, or disconnect the exhaust tube from the tailpipe during the diagnostic period. Reschedule the vehicle for testing from a cold start.

(c) Repeat the recommended starting procedure if the engine has a "false start."

(d) Take the following steps if the engine stalls:

(1) If the engine stalls during an idle period, restart the engine immediately and continue the test. If you cannot restart the engine soon enough to allow the vehicle to follow the next acceleration, stop the driving schedule indicator and reactivate it when the vehicle restarts.

(2) If the engine stalls during operation other than idle, stop the driving schedule indicator, restart the engine, accelerate to the speed required at that point in the driving schedule, reactivate the driving schedule indicator, and continue the test.

(3) Void the test if the vehicle will not restart within one minute. If this happens, remove the vehicle from the dynamometer, take corrective action, and reschedule the vehicle for testing. Record the reason for the malfunction (if determined) and any corrective action. See the standard-setting part for instructions about reporting these malfunctions.

§ 1066.430 Performing emission tests.

The overall test consists of prescribed sequences of fueling, parking, and driving at specified test conditions.

(a) Vehicles are tested for criteria pollutants and greenhouse gas emissions as described in the standard-setting part.

(b) Take the following steps before emission sampling begins:

(1) For batch sampling, connect clean storage media, such as evacuated bags or tare-weighed filters.

(2) Start all measurement instruments according to the instrument manufacturer's instructions and using good engineering judgment.

(3) Start dilution systems, sample pumps, and the data-collection system.