already started, and begin test sequence of §86.335;
(7) Should it be determined that the test must be rerun, then only the soak specified in paragraph (c)(5) of this section need be performed prior to paragraph (d) of this section;
(8) Perform the test cycle, §86.335, and continuously record exhaust gas concentrations;
(9) Read and record all modal data specified in §86.337(d) during the test cycle;
(10) The engine speed and load must be maintained within the requirements of §86.343;
(11) If at any time during a test, the test equipment malfunctions or the specifications in paragraph (d)(10) of this section are not met, the test is void, and may be aborted. The test sequence may be restarted under the provisions of paragraph (c)(5) of this section.

(e) Exhaust gas measurements. (1) Measure HC, CO, CO\textsubscript{2}, and NO\textsubscript{X} volume concentration in the exhaust sample. Should the analyzer response exceed 100 percent of full scale or respond less than 15 percent of the full scale, the next higher or lower analyzer range shall be used per §86.338. For exceptions to the lower limit see §86.338. Should the fuel flow instrument read below 20 percent of the full-scale value, a flow measurement unit with a lower scale must be used unless the option in §86.314 is desired.
(2) For each analyzer, each range that may be used during a test must have the zero and span responses recorded prior to the execution of that test. Only the range(s) used to measure the emissions during a test are required to have their zero and span recorded after the completion of the test.
(3) If during an emission test the value of gauges downstream of the NDIR analyzer(s) (G3 or G4) differs by more than ±2 inches of water from the pretest value, the test is void.

(Secs. 206, 301(a), Clean Air Act as amended (42 U.S.C. 7525, 7601(a)))

(vi) Longer preconditioning times may be used only if prior approval is obtained from the Administrator.

(6) Within a total elapsed time of 10 minutes or less, determine by experimentation the maximum torque at the rated and intermediate speeds;

(7) Calculate the torque corresponding to 2, 25, 50, 75, and 100 percent of the maximum observed torque for the rated and intermediate speeds;

(8) Read and record all pre-test data specified in §86.337(c);

(9) Start the test cycle, §86.336, within 10 minutes, after determining test load using the torque values determined in paragraph (d)(6) of this section;

(10) Read and record all modal data specified in §86.337(d) during the last 2 minutes of each mode;

(11) Continuously record the analyzer's response to the exhaust gas during each test segment;

(12) Test segments may be repeated;

(13) If a delay of more than 20 minutes occurs between the end of one segment and the beginning of another segment the test is void. The test may be restarted at paragraph (d)(8) of this section. If the delay exceeds 4 hours, the test shall be restarted at paragraph (d)(2) of this section;

(14) The engine speed and load must be maintained within the requirements of §86.336 during the last 2 minutes of each mode. If the requirement is not met for all modes during a test segment, that segment of the test is void. The test segment may be restarted beginning with paragraph (d)(8) of this section;

(15) If at any time during a test segment, the test equipment malfunctions or the specifications in paragraph (d)(14) of this section are not met, the test segment is void, and may be aborted. The test segment may be restarted beginning with paragraph (d)(8) of this section;

(16) Fuel flow and air flow during the idle or 2-percent load conditions may be determined just prior to or immediately following the dynamometer sequence, if longer times are required for accurate measurements.

(e) Exhaust gas measurements. (1) Measure HC, CO, CO\textsubscript{2}, and NO\textsubscript{X} volume concentration in the exhaust sample. Should the analyzer response exceed 100 percent of full scale or respond less than 15 percent of full scale, the next higher or lower analyzer range shall be used per §86.338. For exceptions to the lower limit see §86.338. Should the fuel flow instrument read below 20 percent of full-scale value, a smaller flow measurement unit must be used unless the option in §86.314 is desired.

(2) Each analyzer range that may be used during a test segment must have the zero and span responses recorded prior to the execution of that test segment. Only the range(s) used to measure the emissions during a test segment are required to have their zero and span recorded after the completion of the test segment.

(3) It is permitted to change filter elements between test segments.

(4) A leak check is permitted between test segments.

(5) A hang-up check is permitted between test segments.

(6) If, during the emission measurement portion of a test segment, the value of the gauges downstream of the NDIR analyzer(s) G3 or G4 differs by more than ±2 inches of water from the pretest value, the test segment is void.

§ 86.342–79 Post-test procedures.

(a) Begin a hang-up check within 30 seconds of the completion of the last mode in the test. Use the following procedure:

(1) Introduce a zero-grade gas or room air into the sample probe or valve V2 to check the “hangup zero” response. Simultaneously start a time measurement.

(2) Select the lowest HC range used during the test;

(3) The difference between the span zero response and the hang-up zero response shall not be greater than 5.0 percent of full scale or 10 ppmC whichever is greater, within:

(i) 50 seconds for gasoline-fueled engine test, or

(ii) 4 minutes for Diesel engine tests, or

(b) Begin the analyzer span checks within 6 minutes after the completion of the last mode in the test. Record for