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(b) *Functional characteristics of computerized test systems.* The test system is composed of emission measurement devices and other motor vehicle test equipment controlled by a computer.

(1) The test system shall automatically:

- (i) Make a pass/fail decision for all measurements;
- (ii) Record test data to an electronic medium;
- (iii) Conduct regular self-testing of recording accuracy;
- (iv) Perform electrical calibration and system integrity checks before each test, as applicable; and
- (v) Initiate system lockouts for:

(A) Tampering with security aspects of the test system;

(B) Failing to conduct or pass periodic calibration or leak checks;

(C) Failing to conduct or pass the constant volume sampler flow rate check (if applicable);

(D) Failing to conduct or pass any of the dynamometer checks, including coast-down, roll speed and roll distance, power absorption capability, and inertia weight selection checks (if applicable);

(E) Failing to conduct or pass the pressure monitoring device check (if applicable);

(F) Failing to conduct or pass the purge flow metering system check (if applicable); and

(G) A full data recording medium or one that does not pass a cyclical redundancy check.

(2) Test systems in enhanced I/M programs shall include a real-time data link to a host computer that prevents unauthorized multiple initial tests on the same vehicle in a test cycle and to insure test record accuracy.

(3) The test system shall insure accurate data collection by limiting, cross-checking, and/or confirming manual data entry.

(4) *On-board diagnostic test equipment requirements.* The test equipment used to perform on-board diagnostic inspections shall function as specified in 40 CFR 85.2231.

(c) *SIP requirements.* The SIP shall include written technical specifications for all test equipment used in the program and shall address each of the above requirements. The specifications

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shall describe the emission analysis process, the necessary test equipment, the required features, and written acceptance testing criteria and procedures.

[57 FR 52987, Nov. 5, 1992, as amended at 61 FR 40945, Aug. 6, 1996]

§ 51.359 Quality control.

Quality control measures shall insure that emission measurement equipment is calibrated and maintained properly, and that inspection, calibration records, and control charts are accurately created, recorded and maintained.

(a) *General requirements.* (1) The practices described in this section and in appendix A to this subpart shall be followed, at a minimum. Alternatives or exceptions to these procedures or frequencies may be approved by the Administrator based on a demonstration, including control chart analysis, of equivalent performance.

(2) Preventive maintenance on all inspection equipment necessary to insure accurate and repeatable operation shall be performed on a periodic basis.

(3) Computerized analyzers shall automatically record quality control check information, lockouts, attempted tampering, and any other recordable circumstances which should be monitored to insure quality control (e.g., service calls).

(b) *Requirements for steady-state emissions testing equipment.* (1) Equipment shall be maintained according to demonstrated good engineering practices to assure test accuracy. The calibration and adjustment requirements in appendix A to this subpart shall apply to all steady-state test equipment. States may adjust calibration schedules and other quality control frequencies by using statistical process control to monitor equipment performance on an ongoing basis.

(2) For analyzers that use ambient air as zero air, provision shall be made to draw the air from outside the inspection bay or lane in which the analyzer is situated.

(3) The analyzer housing shall be constructed to protect the analyzer bench

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and electrical components from ambient temperature and humidity fluctuations that exceed the range of the analyzer's design specifications.

(4) Analyzers shall automatically purge the analytical system after each test.

(c) *Requirements for transient exhaust emission test equipment.* Equipment shall be maintained according to demonstrated good engineering practices to assure test accuracy. Computer control of quality assurance checks and quality control charts shall be used whenever possible. Exceptions to the procedures and the frequency of the checks described in appendix A of this subpart may be approved by the Administrator based on a demonstration of equivalent performance.

(d) *Requirements for evaporative system functional test equipment.* Equipment shall be maintained according to demonstrated good engineering practices to assure test accuracy. Computer control of quality assurance checks and quality control charts shall be used whenever possible. Exceptions to the procedures and the frequency of the checks described in appendix A of this subpart may be approved by the Administrator based on a demonstration of equivalent performance.

(e) *Document security.* Measures shall be taken to maintain the security of all documents by which compliance with the inspection requirement is established including, but not limited to inspection certificates, waiver certificates, license plates, license tabs, and stickers. This section shall in no way require the use of paper documents but shall apply if they are used by the program for these purposes.

(1) Compliance documents shall be counterfeit resistant. Such measures as the use of special fonts, water marks, ultra-violet inks, encoded magnetic strips, unique bar-coded identifiers, and difficult to acquire materials may be used to accomplish this requirement.

(2) All inspection certificates, waiver certificates, and stickers shall be printed with a unique serial number and an official program seal.

(3) Measures shall be taken to ensure that compliance documents cannot be

stolen or removed without being damaged.

(f) *SIP requirements.* The SIP shall include a description of quality control and record keeping procedures. The SIP shall include the procedure manual, rule, ordinance or law describing and establishing the quality control procedures and requirements.

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§ 51.360 Waivers and compliance via diagnostic inspection.

The program may allow the issuance of a waiver, which is a form of compliance with the program requirements that allows a motorist to comply without meeting the applicable test standards, as long as the prescribed criteria described below are met.

(a) *Waiver issuance criteria.* The waiver criteria shall include the following at a minimum.

(1) Waivers shall be issued only after a vehicle has failed a retest performed after all qualifying repairs have been completed. Qualifying repairs include repairs of the emission control components, listed in paragraph (a)(5) of this section, performed within 60 days of the test date.

(2) Any available warranty coverage shall be used to obtain needed repairs before expenditures can be counted towards the cost limits in paragraphs (a)(5) and (a)(6) of this section. The operator of a vehicle within the statutory age and mileage coverage under section 207(b) of the Clean Air Act shall present a written denial of warranty coverage from the manufacturer or authorized dealer for this provision to be waived for approved tests applicable to the vehicle.

(3) Waivers shall not be issued to vehicles for tampering-related repairs. The cost of tampering-related repairs shall not be applicable to the minimum expenditure in paragraphs (a)(5) and (a)(6) of this section. States may issue exemptions for tampering-related repairs if it can be verified that the part in question or one similar to it is no longer available for sale.

(4) Repairs shall be appropriate to the cause of the test failure, and a visual check shall be made to determine if repairs were actually made if, given