

primary operation, or in the area of registration. Alternate schedules may be established to permit convenient testing of these vehicles (e.g., vehicles belonging to students away at college should be rescheduled for testing during a visit home). I/M programs shall make provisions for providing official testing to vehicles registered elsewhere.

(4) Vehicles which are operated on Federal installations located within an I/M program area shall be tested, regardless of whether the vehicles are registered in the State or local I/M area. This requirement applies to all employee-owned or leased vehicles (including vehicles owned, leased, or operated by civilian and military personnel on Federal installations) as well as agency-owned or operated vehicles, except tactical military vehicles, operated on the installation. This requirement shall not apply to visiting agency, employee, or military personnel vehicles as long as such visits do not exceed 60 calendar days per year. In areas without test fees collected in the lane, arrangements shall be made by the installation with the I/M program for reimbursement of the costs of tests provided for agency vehicles, at the discretion of the I/M agency. The installation shall provide documentation of proof of compliance to the I/M agency. The documentation shall include a list of subject vehicles and shall be updated periodically, as determined by the I/M program administrator, but no less frequently than each inspection cycle. The installation shall use one of the following methods to establish proof of compliance:

(i) Presentation of a valid certificate of compliance from the local I/M program, from any other I/M program at least as stringent as the local program, or from any program deemed acceptable by the I/M program administrator.

(ii) Presentation of proof of vehicle registration within the geographic area covered by the I/M program, except for any program whose enforcement is not through registration denial.

(iii) Another method approved by the State or local I/M program administrator.

(5) Special exemptions may be permitted for certain subject vehicles pro-

vided a demonstration is made that the performance standard will be met.

(b) *SIP requirements.* (1) The SIP shall include a detailed description of the number and types of vehicles to be covered by the program, and a plan for how those vehicles are to be identified, including vehicles that are routinely operated in the area but may not be registered in the area.

(2) The SIP shall include a description of any special exemptions which will be granted by the program, and an estimate of the percentage and number of subject vehicles which will be impacted. Such exemptions shall be accounted for in the emission reduction analysis.

(3) The SIP shall include the legal authority or rule necessary to implement and enforce the vehicle coverage requirement.

§ 51.357 Test procedures and standards.

Written test procedures and pass/fail standards shall be established and followed for each model year and vehicle type included in the program.

(a) *Test procedure requirements.* Emission tests and functional tests shall be conducted according to good engineering practices to assure test accuracy.

(1) Initial tests (i.e., those occurring for the first time in a test cycle) shall be performed without repair or adjustment at the inspection facility, prior to the test, except as provided in paragraph (a)(10)(i) of this section.

(2) The vehicle owner or driver shall have access to the test area such that observation of the entire official inspection process on the vehicle is permitted. Such access may be limited but shall in no way prevent full observation.

(3) An official test, once initiated, shall be performed in its entirety regardless of intermediate outcomes except in the case of invalid test condition, unsafe conditions, or fast pass/fail algorithms.

(4) Tests involving measurement shall be performed with program-approved equipment that has been calibrated accordingly to the quality procedures contained in appendix A to this subpart.

(5) Vehicles shall be rejected from testing if the exhaust system is missing or leaking, or if the vehicle is in an unsafe condition for testing.

(6) Vehicles shall be retested after repair for any portion of the inspection that is failed on the previous test to determine if repairs were effective. To the extent that repair to correct a previous failure could lead to failure of another portion of the test, that portion shall also be retested. Evaporative system repairs shall trigger an exhaust emissions retest.

(7) *Steady-state testing.* Steady-state tests shall be performed in accordance with the procedures contained in appendix B to this subpart.

(8) *Emission control device inspection.* Visual emission control device checks shall be performed through direct observation or through indirect observation using a mirror, video camera or other visual aid. These inspections shall include a determination as to whether each subject device is present and appears to be properly connected and appears to be the correct type for the certified vehicle configuration.

(9) *Evaporative system purge test procedure.* The purge test procedure shall consist of measuring the total purge flow (in standard liters) occurring in the vehicle's evaporative system during the transient dynamometer emission test specified in paragraph (a)(11) of this section. The purge flow measurement system shall be connected to the purge portion of the evaporative system in series between the canister and the engine, preferably near the canister. The inspector shall be responsible for ensuring that all items that are disconnected in the conduct of the test procedure are properly re-connected at the conclusion of the test procedure. Alternative procedures may be used if they are shown to be equivalent or better to the satisfaction of the Administrator. Except in the case of government-run test facilities claiming sovereign immunity, any damage done to the evaporative emission control system during this test shall be repaired at the expense of the inspection facility.

(10) *Evaporative system integrity test procedure.* The test sequence shall consist of the following steps:

(i) Test equipment shall be connected to the fuel tank canister hose at the canister end. The gas cap shall be checked to ensure that it is properly, but not excessively tightened, and shall be tightened if necessary.

(ii) The system shall be pressurized to 14 ± 0.5 inches of water without exceeding 26 inches of water system pressure.

(iii) Close off the pressure source, seal the evaporative system and monitor pressure decay for up to two minutes.

(iv) Loosen the gas cap after a maximum of two minutes and monitor for a sudden pressure drop, indicating that the fuel tank was pressurized.

(v) The inspector shall be responsible for ensuring that all items that are disconnected in the conduct of the test procedure are properly re-connected at the conclusion of the test procedure.

(vi) Alternative procedures may be used if they are shown to be equivalent or better to the satisfaction of the Administrator. Except in the case of government-run test facilities claiming sovereign immunity, any damage done to the evaporative emission control system during this test shall be repaired at the expense of the inspection facility.

(11) *Transient emission test.* The transient emission test shall consist of 240 seconds of mass emission measurement using a constant volume sampler while the vehicle is driven through a computer-monitored driving cycle on a dynamometer with inertial weight settings appropriate for the weight of the vehicle. The driving cycle shall include acceleration, deceleration, and idle operating modes as specified in appendix E to this subpart. The 240 second sequence may be ended earlier using fast pass or fast fail algorithms and multiple pass/fail algorithms may be used during the test cycle to eliminate false failures. The transient test procedure, including algorithms and other procedural details, shall be approved by the Administrator prior to use in an I/M program.

(12) *On-board diagnostic checks.* Inspection of the on-board diagnostic system shall be according to the procedure described in 40 CFR 85.2222, at a minimum.

(13) *Approval of alternative tests.* Alternative test procedures may be approved if the Administrator finds that—

(i) Such procedures are in accordance with good engineering practice, including errors of commission (at cutpoints corresponding to equivalent emission reductions) no higher than the tests they would replace;

(ii) Such procedures show a correlation with the Federal Test Procedure (with respect to their ability to detect high emitting vehicles and ensure their effective repair) equal to or better than the tests they would replace; and

(iii) Such procedures would produce equivalent emission reductions in combination with other program elements.

(b) *Test standards—(1) Emissions standards.* HC, CO, and CO+CO₂ (or CO₂ alone) emission standards shall be applicable to all vehicles subject to the program and repairs shall be required for failure of any standard regardless of the attainment status of the area. NO_x emission standards shall be applied to vehicles subject to a transient test in ozone nonattainment areas and in an ozone transport region, unless a waiver of NO_x controls is provided to the State under § 51.351(d) of this subpart.

(i) *Steady-state short tests.* The steady-state short test emission standards for 1981 and later model year light duty vehicles and light duty trucks shall be at least as stringent as those in appendix C to this subpart.

(ii) *Transient test.* Transient test emission standards shall be established for HC, CO, CO₂, and NO_x for subject vehicles based on model year and vehicle type.

(2) *Visual equipment inspection standards.* (i) Vehicles shall fail visual inspections of subject emission control devices if such devices are part of the original certified configuration and are found to be missing, modified, disconnected, or improperly connected.

(ii) Vehicles shall fail visual inspections of subject emission control devices if such devices are found to be incorrect for the certified vehicle configuration under inspection. Aftermarket parts, as well as original equipment manufacture parts, may be considered correct if they are proper for the certified vehicle configuration.

Where an EPA aftermarket approval or self-certification program exists for a particular class of subject parts, vehicles shall fail visual equipment inspections if the part is neither original equipment manufacture nor from an approved or self-certified aftermarket manufacturer.

(3) *Functional test standards—(i) Evaporative system integrity test.* Vehicles shall fail the evaporative system pressure test if the system cannot maintain a system pressure above eight inches of water for up to two minutes after being pressurized to 14±0.5 inches of water or if no pressure drop is detected when the gas cap is loosened as described in paragraph (a)(10)(iv) of this section. Additionally, vehicles shall fail the evaporative test if the canister is missing or obviously damaged, if hoses are missing or obviously disconnected, or if the gas cap is missing.

(ii) *Evaporative canister purge test.* Vehicles with a total purge system flow measuring less than one liter, over the course of the transient test required in paragraph (a)(9) of this section, shall fail the evaporative purge test.

(4) *On-board diagnostics test standards.* Vehicles shall fail the on-board diagnostic test if they fail to meet the requirements of 40 CFR 85.2207, at a minimum. Failure of the on-board diagnostic test need not result in failure of the vehicle inspection/maintenance test until January 1, 2001.

(c) *Fast test algorithms and standards.* Special test algorithms and pass/fail algorithms may be employed to reduce test time when the test outcome is predictable with near certainty, if the Administrator approves by letter the equivalency to full procedure testing.

(d) *Applicability.* In general, section 203(a)(3)(A) of the Clean Air Act prohibits altering a vehicle's configuration such that it changes from a certified to a non-certified configuration. In the inspection process, vehicles that have been altered from their original certified configuration are to be tested in the same manner as other subject vehicles.

(1) Vehicles with engines other than the engine originally installed by the manufacturer or an identical replacement of such engine shall be subject to

Environmental Protection Agency

§ 51.358

the test procedures and standards for the chassis type and model year including visual equipment inspections for all parts that are part of the original or now-applicable certified configuration and part of the normal inspection. States may choose to require vehicles with such engines to be subject to the test procedures and standards for the engine model year if it is newer than the chassis model year.

(2) Vehicles that have been switched from an engine of one fuel type to another fuel type that is subject to the program (e.g., from a diesel engine to a gasoline engine) shall be subject to the test procedures and standards for the current fuel type, and to the requirements of paragraph (d)(1) of this section.

(3) Vehicles that are switched to a fuel type for which there is no certified configuration shall be tested according to the most stringent emission standards established for that vehicle type and model year. Emission control device requirements may be waived if the program determines that the alternatively fueled vehicle configuration would meet the new vehicle standards for that model year without such devices.

(4) Mixing vehicle classes (e.g., light-duty with heavy-duty) and certification types (e.g., California with Federal) within a single vehicle configuration shall be considered tampering.

(e) *SIP requirements.* The SIP shall include a description of each test procedure used. The SIP shall include the rule, ordinance or law describing and establishing the test procedures.

[57 FR 52987, Nov. 5, 1992, as amended at 61 FR 40945, Aug. 6, 1996; 63 FR 24433, May 4, 1998]

§ 51.358 Test equipment.

Computerized test systems are required for performing any measurement on subject vehicles.

(a) *Performance features of computerized test systems.* The test equipment shall be certified by the program to meet the requirements contained in appendix D to this subpart, and newly acquired systems shall be subjected to acceptance test procedures to ensure compliance with program specifications.

(1) Emission test equipment shall be capable of testing all subject vehicles and shall be updated from time to time to accommodate new technology vehicles as well as changes to the program.

(2) At a minimum, emission test equipment:

(i) Shall be automated to the highest degree commercially available to minimize the potential for intentional fraud and/or human error;

(ii) Shall be secure from tampering and/or abuse;

(iii) Shall be based upon written specifications; and

(iv) Shall be capable of simultaneously sampling dual exhaust vehicles.

(3) The vehicle owner or driver shall be provided with a computer-generated record of test results, including all of the items listed in 40 CFR part 85, subpart W as being required on the test record. The test report shall include:

(i) A vehicle description, including license plate number, vehicle identification number, and odometer reading;

(ii) The date and time of test;

(iii) The name or identification number of the individual(s) performing the tests and the location of the test station and lane;

(iv) The type of tests performed, including emission tests, visual checks for the presence of emission control components, and functional, evaporative system checks;

(v) The applicable test standards;

(vi) The test results, including exhaust concentrations and pass/fail results for each mode measured, pass/fail results for evaporative system checks, and which emission control devices inspected were passed, failed, or not applicable;

(vii) A statement indicating the availability of warranty coverage as required in section 207 of the Clean Air Act;

(viii) Certification that tests were performed in accordance with the regulations and, in the case of decentralized programs, the signature of the individual who performed the test; and

(ix) For vehicles that fail the tailpipe emission test, information on the possible causes of the specific pattern of high emission levels found during the test.