CHAPTER 27B

SAMPLING AND ANALYTICAL PROCEDURES

Authority

N.J.S.A. 13:1D–5, 13:1D–9, 26:2C–8.

Source and Effective Date

R.1974 d.360, effective December 30, 1974.
See: 7 N.J.R. 48(a).

Executive Order No. 66(1978) Expiration Date

Chapter 27B, Sampling and Analytical Procedures, is exempt from Executive Order No. 66(1978).

Chapter Historical Note

Chapter 27B, Sampling and Analytical Procedures was adopted as R.1974 d.360, effective December 30, 1974. See: 7 N.J.R. 48(a). Chapter 27B was amended and Subchapters 2 and 3 were adopted by R.1975 d.76, effective March 20, 1975. See: 7 N.J.R. 144(a). Revisions which consolidated the prior text of Subchapter 3 (making it Reserved) with Subchapter 1 became effective June 21, 1986 as R.1986 d.121. See: 8 N.J.R. 223(a). Subchapter 4 became effective January 21, 1985 (operative July 1, 1985) as R.1985 d.3. See: 16 N.J.R. 2894(a), 17 N.J.R. 184(a). Subchapter 3, Air Test Method 3: Sampling and Analytical Procedures for the Determination of Volatile Organic Compounds from Source Operations, was adopted as R.1986 d.377, effective September 8, 1986 (operative October 10, 1986). See: 17 N.J.R. 2194(a), 18 N.J.R. 1800(a).

CHAPTER TABLE OF CONTENTS

SUBCHAPTER 1. SAMPLING AND ANALYTICAL PROCEDURES FOR DETERMINING EMISSIONS OF PARTICLES FROM MANUFACTURING PROCESSES AND FROM COMBUSTION OF FUELS

Authority

Unless otherwise expressly noted, all provisions of this Subchapter were adopted pursuant to authority of N.J.S.A. 26:2C–1 et seq. and were filed and became effective on December 30, 1974, as R.1974 d.360. See: 7 N.J.R. 48(a). Revisions to the original rules were filed and became effective on May 20, 1975, as R.1975 d.136. See: 7 N.J.R. 261(d). Further revisions were filed on April 21, 1976, as R.1976 d.121 to become effective on June 21, 1976. See: 8 N.J.R. 223(a).

7:27B–1.1 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise. Terms not defined in this section are intended to be used as defined in the New Jersey Air Pollution Control Act, N.J.S.A. 26:2C–1 et seq., and Chapter 27 in Title 7 of the New Jersey Administrative Code, or are used in their common engineering or scientific sense. Symbols and nomenclature are defined in Appendix 6.

"Bureau" means the Bureau of Air Pollution Control.

"Department" means the Department of Environmental Protection.

"Equipment diameter" means the diameter of a circular cross section having the same area as a noncircular cross section.

"Performance test" or "test" means a series of test runs used for the purpose of determining emissions of air contaminants to the outdoor atmosphere.

"Run" or "test run" means a single integrated measurement or procedure used for the purpose of collecting a sample of air contaminants emitted to the outdoor atmosphere during a specified time interval.

"Sample collector" means any device used to selectively separate and collect a sample of a specified contaminant from a gas stream, including, but not limited to, thimbles, filters, impingers, bubblers, cyclones, condensers and absorbers.

"Sampling location" means the specific position at which a sampling port is located in a stack or chimney.

"Sampling port" means an opening in a stack or chimney into which sampling or measuring devices may be inserted or through which a sample is extracted.

"Sampling rate" means the volume rate at which stack gases are drawn through a sampling train.

"Sampling train" means a combination of entrapment devices, instruments, and auxiliary apparatus arranged in a prescribed sequence to selectively separate and collect samples of specified air contaminants.

"Sampling velocity" means the linear velocity at which stack gases are drawn through the nozzle of a sampling train.

"Stack gas velocity" means the linear velocity (in the direction of gas flow) at which stack gases pass the sampling train nozzle.

"Standard conditions" means 70 degrees Fahrenheit and one atmosphere pressure (14.7 psia or 760 mm Hg).

"Traverse point" means a predetermined point at which a sample or measurement is obtained inside a stack or chimney.

7:27B–1.2 Acceptable test methods

(a) Because of size and/or inertial effects on the particles to be measured, they are to be collected under isokinetic conditions to ensure that the sample is representative. With isokinetic sampling, that portion of the gas stream from which the particles are entrapped is made to enter the sampling nozzle in the same direction and at the same velocity as the gas stream in the stack or chimney being sampled. The sample weight is determined gravimetrically after removal of uncombined water.

(b) Performance tests shall be conducted in accordance with test methods set forth hereinafter. Alternate test procedures, equipment and/or materials of construction may be used subject to prior approval and/or conditions prescribed by the Department. The Department may itself employ such alternates when warranted by test conditions or other circumstances.

12. ASTM Designation D2698–73, Standard Test Method for the Determination of the Pigment Content of Solvent Reducible Paints by High Speed Centrifuging, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103 ($4.00).

13. ASTM Designation D95–83, Standard Method for Determining Water in Petroleum and Bituminous Materials by Distillation, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103 ($4.00).

14. Method 2–1 California Air Resources Board, Test Procedures for Determining the Efficiency of Gasoline Vapor Recovery Systems at Service Stations. Available from State of California, Air Resources Board, 1102 Q Street, Sacramento, California 95812.

15. ASTM Designation D322–80, Standard Test Method for Gasoline Dilutent in Used Gasoline Engine Oils by Distillation, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103 ($4.00).

16. Code of Federal Regulations, Title 40, Part 60—Reference Methods 2A and 2B are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

Amended by R.1992 d.102, effective March 2, 1992 (operative March 28, 1992).
See: 23 N.J.R. 1858(b), 24 N.J.R. 792(a).
Repealed and replaced (a)3 regarding vapor pressure measurement methods.

Editor's Note: In addition to the above text, Appendices A through H were filed with these rules, but not reproduced herein. Further information regarding these Appendices may be obtained by contacting:

Bureau of Technical Services
Division of Environmental Quality
Department of Environmental Protection
CN 411 (380 Scotch Road)
Trenton, New Jersey 08625–0411

SUBCHAPTER 4. AIR TEST METHOD 4: TESTING PROCEDURES FOR MOTOR VEHICLES

Authority

N.J.S.A. 13:1D–5, 13:1D–9, 26:2C–8, 26:2C–8.1, 26:2C–8.2 and 26:2C–8.5.

Source and Effective Date

R.1985 d.3, effective January 21, 1985 (operative July 1, 1985).
See: 16 N.J.R. 2894, 17 N.J.R. 184(a).

7:27B–4.1 Definitions

The following words and terms, when used in this subchapter, have the following meanings, unless the context clearly indicates otherwise.

"Alternative smoke opacity standard" means the smoke opacity standard applicable to a specific vehicle-engine-chassis combination, as determined by the procedure set forth at N.J.A.C. 7:27B–4.13.

"California Air Resources Board" or "CARB" means the agency of the State of California established and empowered to regulate sources of air contaminant emissions, including motor vehicles, pursuant to California Health and Safety Code, Sections 39500 et seq.

"Carbon monoxide" or "CO" means a gas having a molecular composition of one carbon atom and one oxygen atom.

"Certified configuration" means a heavy-duty diesel engine design or a light-duty diesel-powered motor vehicle-engine-chassis design certified by either of the following agencies as meeting the applicable emission standards for heavy-duty diesel engines or light-duty diesel-powered motor vehicles manufactured in a given model year:

1. EPA, for model year 1971 or for a more recent model year heavy-duty diesel vehicle engine;

2. EPA, for model year 1968 or for a more recent model year light-duty diesel vehicle;

3. CARB, for model year 1973 or for a more recent model year heavy-duty diesel vehicle engine; or

4. CARB, for model year 1966 or for a more recent model year light-duty diesel vehicle.

"Chassis dynamometer" or "dynamometer" means a power absorption device utilizing a set of rollers on which a motor vehicle is driven to simulate on-road vehicle operation.

"Commissioner" means the Commissioner of the Department of Environmental Protection.

"Crankcase emissions" means substances emitted into the atmosphere from any portion of the engine crankcase ventilation or lubrication system.

"Department" means the New Jersey Department of Environmental Protection.

"Dew point" means the temperature to which air must be cooled for saturation to occur.

"Diesel bus" means any diesel-powered autobus or motorbus of any size or configuration, whether registered in this State or elsewhere, that is designed or used for intrastate or interstate transportation of passengers for hire or otherwise

on a public road, street or highway or any public or quasi-public property in this State, including, but not limited to, autobuses under the jurisdiction of the New Jersey Department of Transportation pursuant to Titles 27 or 48 of the Revised Statutes; autobuses of the New Jersey Transit Corporation and its contract carriers that are under the inspection jurisdiction of the New Jersey Department of Transportation; autobuses that are subject to Federal motor carrier safety regulations; autobuses under the authority of the Interstate Commerce Commission or its successor agency; school buses, as defined pursuant to N.J.S.A. 39:1–1; and hotel, casino, charter, and special buses.

"Diesel emissions inspection center" or "DEIC" means a facility licensed by the Division of Motor Vehicles pursuant to N.J.S.A. 39:8–69 and N.J.A.C. 13:20–47.

"Diesel engine" means a compression ignition type of internal combustion engine.

"Diesel-powered" means utilizing a diesel engine.

"Division of Motor Vehicles" or "DMV" means the Division of Motor Vehicles within the New Jersey Department of Transportation.

"Element of design" means any part or system on a motor vehicle or a motor vehicle engine pertaining to the vehicle's or engine's certified configuration.

"Emission control apparatus" means any device utilized by the vehicle manufacturer and/or the engine manufacturer to control the emission of any regulated emission, including any associated component which monitors the function and maintenance of such a device.

"Engine RPM hookup" means a mechanism integral to the smokemeter which senses the engine speed in revolutions per minute.

"EPA" means the United States Environmental Protection Agency.

"Exhaust aftertreatment" means any element of design which affects or alters the molecular content of the exhaust emissions of a diesel engine.

"Exhaust emissions" means the emissions (including any liquid or solid particles in the gaseous stream) released into the atmosphere from any opening downstream from the exhaust ports of a motor vehicle engine.

"Exhaust leak" means any condition of the exhaust system which permits exhaust emissions to escape into the atmosphere at any point between the exhaust ports of a motor vehicle engine and the outlet of the engine exhaust pipe.

"Exhaust stack diameter" means the external diameter of the exhaust outlet of the vehicle, rounded to the nearest whole inch, except in those instances where the thickness of the pipe wall is so great that using the external diameter would result, when rounding off to the nearest inch, in a diameter measurement which is a full inch greater than that which would have resulted from the measurement of the internal diameter.

"Full-flow smokemeter" means a smokemeter which measures smoke opacity by passing a beam of light through the axis of the exhaust plume as the exhaust exits the tailpipe of a motor vehicle.

"Gasoline-fueled" means powered by a hydrocarbon fuel other than diesel fuel, including, but not limited to, gasoline, natural gas, liquified petroleum gas, or propane or powered by alcohol fuels, hydrocarbon-alcohol fuel blends or hydrogen.

"Governor" means a mechanism installed on a diesel engine by the original equipment manufacturer for the purpose of limiting the maximum engine RPM.

"Gross vehicle weight rating" or "GVWR" means the value specified by the vehicle manufacturer as the maximum loaded weight of a single or combination vehicle.

"Heavy-duty diesel vehicle" or "HDDV" means a diesel-powered motor vehicle other than a diesel bus that has a GVWR exceeding 8,500 pounds and is designed primarily for transporting persons or property.

"Heavy-duty gasoline-fueled vehicle" or "HDGV" means a gasoline-fueled motor vehicle that has a GVWR exceeding 8,500 pounds and is designed primarily for transporting persons or property.

"Hydrocarbons (HC)" means any compound or mixture of compounds whose molecules consist of atoms of hydrogen and carbon only.

"Idle" means an operating mode where the vehicle engine is not engaged in gear and where the engine operates at a speed at the revolutions per minute specified by the engine or vehicle manufacturer.

"Idle mode" means the vehicle test mode of the prescribed inspection test procedure, consisting of a non-loaded, throttled engine speed at the revolutions per minute specified by the manufacturer.

"Inertia weight" means the vehicle curb weight plus 300 pounds.

"Inspector" means any person authorized by the State of New Jersey to determine whether a vehicle complies with the requirements of N.J.A.C. 7:27–14.

"Light-duty diesel vehicle" or "LDDV" means a diesel-powered motor vehicle, other than a diesel bus, that has a GVWR of 8,500 pounds or less and is designed primarily for transporting persons or property.

"Light-duty gasoline-fueled vehicle" or "LDGV" means a gasoline-fueled motor vehicle that has a GVWR of 8,500 pounds or less, is designed primarily for use as a passenger car or is a passenger car derivative and is capable of seating no more than 12 passengers.

"Light-duty gasoline-fueled truck" or "LDGT" means a gasoline-fueled motor vehicle that has a GVWR of 8,500 pounds or less, a vehicle curb weight of 6,000 pounds or less, and a basic frontal area of 45 square feet or less, and that is:

1. Designed primarily for the transportation of property or more than 12 passengers; or

2. Available with special features enabling off-street or off-highway operation and use.

"Light-duty gasoline-fueled truck 1" or "LDGT1" means a light-duty gasoline-fueled truck with a GVWR of 6,000 pounds or less.

"Light-duty gasoline-fueled truck 2" or "LDGT2" means a light-duty gasoline-fueled truck with a GVWR of more than 6,000 pounds.

"Low speed engine" means an engine with a maximum governed RPM of no more than 2,400.

"Maximum governed RPM" means, for an engine which has a functioning governor, the manufacturer's recommended maximum engine speed as restricted by the governor. For an engine which does not have a functioning governor, this term means a value of 80 percent of the manufacturer's recommended maximum engine speed.

"Measurement path" means the linear path between the sending and receiving points of a full-flow smokemeter.

"Motor vehicle" means all vehicles propelled otherwise than by muscular power, excepting motorized bicycles and such vehicles as run only upon rails or tracks.

"Motor vehicle emission testing equipment" means equipment used to conduct a test of a gasoline-fueled motor vehicle set forth at N.J.A.C. 7:27B, and which satisfies all applicable specifications set forth at N.J.A.C. 7:27B–4.14, Specifications for motor vehicle emission testing equipment for use in the New Jersey Enhanced Inspection and Maintenance Program. For motor vehicle inspections conducted pursuant to N.J.A.C. 7:27–15 and this subchapter, this term shall include all devices used for performing a motor vehicle inspection, including, but not limited to, exhaust gas analyzers, evaporative pressure testing apparatus, evaporative purge testing apparatus, dynamometers, computers and related software.

"Motorized bicycle" means a pedal bicycle having a helper motor characterized in that either the maximum piston displacement is less than 50 cubic centimeters, or said motor is rated at no more than 1.5 brake horsepower and said bicycle is capable of a maximum speed of no more than 25 miles per hour on a flat surface.

"MPH" means miles per hour.

"Neutral density filter" means a device used to calibrate or verify the accuracy of the raw opaque value within the measurement path of a smokemeter which consists of a lens of neutral particle density and which filters visible light to a known opacity value.

"Oil temperature probe" means a device integral to a smokemeter which measures the engine crankcase oil temperature.

"Opacity" means the property of a substance whereby it partially or wholly obstructs the transmission of visible light expressed as the percentage to which light is obstructed.

"Operating mode" means a procedure for operating a diesel-powered motor vehicle or a diesel-powered engine during measurement of smoke opacity in the exhaust emissions.

"Partial-flow smokemeter" means a smokemeter which samples, at frequent intervals, a representative portion of the total exhaust flow and directs it to a measurement cell, and which calculates smoke opacity based upon the sample smoke density and the diameter of the exhaust pipe.

"Particles" means any material, except uncombined water, which exists as liquid particles or solid particles at standard conditions.

"Peak smoke opacity" means the highest numerical value of smoke opacity measured during a snap acceleration smoke opacity test at N.J.A.C. 7:27B–4.3(a), a rolling acceleration smoke opacity test at N.J.A.C. 7:27B–4.3(b), or a stall smoke opacity test at N.J.A.C. 7: 27B–4.3(c).

"Regulated emission" means any solid, liquid or gaseous substance which is emitted from a motor vehicle or motor vehicle engine and which is regulated by the EPA pursuant to 40 C.F.R. Part 86.

"RPM" means revolutions per minute.

"SAE J1667" means the recommended practice incorporated in document number J1667 published by the Society of Automotive Engineers in February 1996, entitled Snap-Acceleration Smoke Test Procedure for Heavy-Duty Diesel-Powered Vehicles, and all appendices attached thereto, incorporated herein by reference.

"Smoke" means the emissions, including airborne solid and/or liquid particles, exclusive of water vapor, released into the atmosphere from a process of combustion.

"Smokemeter" means smoke measurement equipment designed and manufactured in accordance with specifications set forth at N.J.A.C. 7:27B–4.15.

"Tailpipe" means the final downstream section of pipe in a motor vehicle's exhaust system.

"Vehicle curb weight" means the actual weight of a motor vehicle in operational status or the weight given by the manufacturer for such a vehicle. Such weight shall include the weight of all standard equipment, of the fuel at nominal tank capacity, and of optional equipment computed in accordance with 40 CFR section 86.082–24.

"Wide open throttle" or "WOT" means, in reference to a diesel-powered motor vehicle, the positioning of the primary engine power control to deliver maximum potential power and fuel. In most cases this is the positioning of the vehicle's accelerator control at its forward-most or downward-most position.

Emergency amendment R.1995 d.409, effective June 29, 1995 (expires August 28, 1995).
See: 27 N.J.R. 2752(a).
Adopted concurrent proposal, R.1995 d.527, effective August 28, 1995 (operative October 27, 1995).
See: 27 N.J.R. 2752(a), 27 N.J.R. 3806(a).
Amended by R.1997 d.283, effective July 7, 1997 (operative August 11, 1997).
See: 29 N.J.R. 726(a), 29 N.J.R. 2826(b).
Amended "Chassis dynamometer", "Gasoline-fueled" , "Heavy-duty gasoline-fueled vehicle", "Hydrocarbons (HC)", "Idle", and "Motor vehicle emission testing equipment".
Amended by R.1997 d.393, effective September 15, 1997 (operative October 7, 1997).
See: 29 N.J.R. 971(a), 29 N.J.R. 4108(a).
Added "Alternative smoke opacity standard", "California Air Resources Board", "Certified configuration", "Dew point", "Diesel bus", "Diesel emissions inspection center", "Diesel engine", "Diesel-powered", "Division of Motor Vehicles", "Element of design", "Engine RPM hookup", "Exhaust aftertreatment", "Exhaust stack diameter", "Full-flow smokemeter", "Governor", "Light-duty diesel vehicle", "Low speed engine", "Maximum governed RPM", "Measurement path", "Neutral density filter", "Oil temperature probe", "Partial-flow smokemeter", "Particles", "Peak smoke opacity", "Regulated emission", "SAE J667", "Tailpipe" and "Wide open throttle"; deleted "Autobus", "Motor vehicle safety specialist" and "Prescribed inspection test procedure"; and amended "Department", "Emission control apparatus", "Exhaust emissions", "Gasoline-fueled", "Gross vehicle weight rating", "Heavy-duty diesel vehicle", "Idle", "Inspector", "Opacity", "Smoke", and " Smokemeter".

7:27B–4.2 General instructions for all tests

(a) The general procedures which must be carried out in order for an emissions test conducted pursuant to any provision of this subchapter to be valid are as follows:

1. Prior to conducting an emissions test pursuant to this subchapter, ensure that the equipment is calibrated by checking and, if necessary, adjusting zero and span settings;

2. Within one week prior to testing, verify smokemeter calibrations for a zero smoke opacity value;

3. Verify a value representing between 20 and 60 percent opacity by using a neutral density filter certified to be within one percent of the actual opacity value. If the meter does not read within one percent opacity of the filter value, discontinue testing;

4. Operate the engine under load, or by driving the vehicle, for at least 15 minutes or until the engine temperature gauges read within normal operating ranges; do not make any measurement until the engine is at normal operating temperature;

5. Examine the vehicle for an exhaust leak, and, if an exhaust leak is observed, have the leak repaired before performing a test;

6. Prior to conducting a smoke opacity test on a diesel-powered motor vehicle equipped with multiple exhaust outlets, determine which exhaust outlet exhibits the highest opacity level by visually comparing the opacity level of each outlet during a single repetition of the snap acceleration test as set forth at N.J.A.C. 7:27B–4.3(a), if appropriate, or by liberally accelerating the engine at WOT, not to exceed maximum governed RPM. Conduct the testing using the highest-opacity exhaust outlet;

7. Do not conduct a smoke opacity test on a diesel-powered motor vehicle unless and until the ambient air temperature is between 35 and 95 degrees Fahrenheit and is above the dew point;

8. Before initiating the test, turn off all accessories;

9. If, at any time before or during the inspection of a diesel-powered motor vehicle, continuous blue smoke is observed in the exhaust emissions for more than three seconds, discontinue the testing and determine that the vehicle has failed to pass the smoke opacity test conducted pursuant to N.J.A.C. 7:27–14.6;

10. At the conclusion of the inspection of a diesel-powered motor vehicle at a DEIC, ensure that a printed test report has been produced by the smokemeter and

11. At the conclusion of the smoke opacity test, confirm that the smokemeter reads a value of less than ±2.0 percent opacity when the smokemeter is disengaged from the vehicle exhaust stream.

(b) Equipment to be used in conducting a smoke opacity test on a diesel-powered motor vehicle in accordance with N.J.A.C. 7:27–14.5 shall satisfy all specifications and standards for a smokemeter as set forth in N.J.A.C. 7:27B–4.15

(c) Any equipment to be used in conducting a motor vehicle emissions test as set forth in this subchapter shall first be approved by the Department. Approval of testing equipment shall be based on the determination by the Department of the following:

1. The equipment meets all applicable specifications;

2. The equipment hardware and software comply with the data collection and transfer protocols in use throughout New Jersey's motor vehicle inspection programs;

3. The equipment maintains compatibility with other test equipment used concurrently during the motor vehicle inspection process with which it is required to interface; and

4. The equipment is complete in that it includes all options and accessories necessary for performing each emissions inspection test procedure for which it was designed and it is to be used.

(d) The Department shall periodically review and evaluate equipment offered by manufacturers of motor vehicle testing equipment of which it is aware or has been made aware and make available a list of approved equipment for specific test procedures. A copy of this list can be obtained from the Bureau of Transportation Control in the Department of Environmental Protection.

Amended by R.1997 d.283, effective July 7, 1997 (operative August 11, 1997).
See: 29 N.J.R. 726(a), 29 N.J.R. 2826(b).
Added (e) and (f).
Amended by R.1997 d.393, effective September 15, 1997 (operative October 7, 1997).
See: 29 N.J.R. 971(a), 29 N.J.R. 4108(a).
Substantially amended section.

7:27B–4.3 Smoke opacity testing procedures for heavy-duty diesel vehicles and diesel buses

(a) The testing procedures for the snap acceleration smoke opacity test, required pursuant to N.J.A.C. 7:27–14.5, shall be performed as follows:

1. Determine whether the vehicle has a properly functioning governor. Do not proceed with the testing of a vehicle which is determined to have a disabled or an improperly functioning governor until the governor is repaired or a properly functioning governor is installed;

2. Firmly place the smokemeter on the exhaust outlet of the motor vehicle. If the vehicle has multiple exhaust outlets, firmly place the smokemeter on the exhaust outlet selected pursuant to N.J.A.C. 7:27B–4.2(e);

3. If using a partial-flow smokemeter, measure the exhaust stack diameter and determine the engine horsepower. Enter these values into the smokemeter;

4. If using a full-flow smokemeter, install the smokemeter so that the measurement path is in the axis of the exhaust plume and within five centimeters of the exhaust outlet, and so that the installation is in accordance with SAE J1667 Appendix D. Measure the exhaust stack diameter and determine the engine horsepower. Enter these values into the smokemeter. Smoke opacity shall be measured only from an exhaust outlet which serves as the effluent point of an exhaust pipe ending in a straight length of at least two linear feet and which has an internal diameter of no more than five inches (127 mm), or from an exhaust outlet to which a leak-free adaptor has been attached to allow the vehicle to meet these conditions;

5. If conducting this inspection at a DEIC, attach the engine RPM hookup and oil temperature probe to the motor vehicle;

6. If the vehicle is equipped with a manual transmission, place the transmission in neutral and release the clutch. If the vehicle is equipped with an automatic transmission, place the gear selector in the park position; or alternately, if a park selection is not available, place the gear selector in the neutral position. For both manual and automatic transmission vehicles, depress and hold the brakes firmly depressed throughout the remainder of this procedure;

7. Beginning with the accelerator pedal in the low idle position, rapidly accelerate the engine at wide open throttle and hold the accelerator pedal at wide open throttle for one to three seconds after the engine has achieved maximum governed RPM. Release the accelerator pedal and allow the engine to idle for five to 45 seconds. Repeat this procedure four more times. (The purpose of the first and second test runs is to purge the exhaust system of excess smoke and soot);

8. Record the peak smoke opacity readings obtained in (a)7, above, during the third, fourth and fifth test runs; and

9. Determine the arithmetic mean of the three peak smoke opacity readings recorded in (a)8 above. If the difference between the values (given in percent smoke opacity) of the highest and lowest of the three peak smoke opacity readings is greater than five percent smoke opacity, the test shall be invalid, and may be repeated until the difference between these values is five percent smoke opacity or less. If the arithmetic mean of the three peak smoke opacity readings exceeds the standards set forth at N.J.A.C. 7:27–14.6(b), (c), (d) or (e), or an alternative smoke opacity standard established pursuant to N.J.A.C. 7:27B–4.13, as applicable, the vehicle shall be deemed to have failed to pass the snap acceleration smoke opacity test.

(b) The testing procedures for the rolling acceleration smoke opacity test, required pursuant to N.J.A.C. 7:27–14.5, shall be performed on a straight and level road course, as follows:

1. Firmly place the smokemeter on the exhaust outlet of the motor vehicle. If the vehicle has multiple exhaust outlets, firmly place the smokemeter on the exhaust outlet selected pursuant to N.J.A.C. 7:27B–4.2(f);

2. If using a partial-flow smokemeter, measure the exhaust stack diameter and determine the engine horsepower. Enter these values into the smokemeter;

3. If using a full-flow smokemeter, install the smokemeter so that the measurement path is in the axis of the exhaust plume and within five centimeters of the exhaust outlet and so that the installation is in accordance with SAE J1667 Appendix D. Measure the exhaust stack diameter and determine the engine horsepower. Enter these values into the smokemeter. Smoke opacity shall be measured only from an exhaust outlet which serves as the effluent point of an exhaust pipe ending in a straight length of at least two linear feet and which has an internal diameter of no more than five inches (127 mm), or from an exhaust outlet to which a leak-free adaptor has been attached to allow the vehicle to meet these conditions;

4. If conducting this inspection at a DEIC, attach the engine RPM hookup and oil temperature probe to the motor vehicle;

5. Place the transmission in neutral and apply the brakes. If the vehicle is equipped with a governor, rapidly accelerate the engine to maximum governed RPM. If the vehicle is not equipped with a governor, liberally accelerate the engine, but do not exceed 80 percent of the manufacturer's recommended engine operating speed. Repeat this procedure once. (The purpose of this procedure is to purge the exhaust system of excess smoke and soot);

6. Disengage the brakes. If the vehicle is equipped with a manual transmission, place the transmission in low gear and accelerate to idle plus 200 RPM; if the vehicle is equipped with an automatic transmission, place the transmission in drive or low gear and accelerate to idle plus 200 RPM. (This shall be considered operation in a rolling idle mode.) From the rolling idle, rapidly accelerate the vehicle at wide open throttle, ending the test run as soon as either maximum governed RPM or 12 miles per hour is achieved;

7. Record the peak smoke opacity reading obtained during the test run described in (b)6 above. If the peak smoke opacity reading exceeds the standards set forth at N.J.A.C. 7:27–14.6(b) or (e), or an alternative smoke opacity standard established pursuant to N.J.A.C. 7:27B–4.13, as applicable, the vehicle shall be deemed to have failed to pass the rolling acceleration smoke opacity test.

(c) The testing procedures for the stall smoke opacity test, required pursuant to N.J.A.C. 7:27–14.5, shall be performed, on a vehicle with an automatic transmission only, as follows:

1. Determine whether the vehicle's braking system is in proper operating condition and is capable of restraining the test vehicle at wide open throttle with the transmission engaged in a drive gear. Do not proceed with the testing of a vehicle which is determined to have an improperly functioning braking system or a braking system which is not capable of restraining the test vehicle at wide open throttle with the transmission engaged in a drive gear until the braking system is repaired;

2. Block the drive wheels for the duration of this testing procedure;

3. Firmly place the smokemeter on the exhaust outlet of the motor vehicle. If the vehicle has multiple exhaust outlets, firmly place the smokemeter on the exhaust outlet selected pursuant to N.J.A.C. 7:27B–4.2(f);

4. If using a partial-flow smokemeter, measure the exhaust stack diameter and determine the engine horsepower. Enter these values into the smokemeter;

5. If using a full-flow smokemeter, install the smokemeter so that the measurement path is in the axis of the exhaust plume and within five centimeters of the exhaust outlet and so that the installation is in accordance with SAE J1667 Appendix D. Measure the exhaust stack diameter and determine the engine horsepower. Enter these values into the smokemeter. Smoke opacity shall be measured only from an exhaust outlet which serves as the effluent point of an exhaust pipe ending in a straight length of at least two linear feet and which has an internal diameter of no more than five inches (127 mm), or from an exhaust outlet to which a leak-free adaptor has been attached to allow the vehicle to meet these conditions;

6. If conducting this inspection at a DEIC, attach the engine RPM hookup and oil temperature probe to the motor vehicle and record the oil temperature;

7. Place the transmission in neutral and apply the brakes. If the vehicle is equipped with a governor, rapidly accelerate the engine to maximum governed RPM. If the vehicle is not equipped with a governor, liberally accelerate the engine, but do not exceed 80 percent of the manufacturer's recommended engine operating speed. Repeat this procedure once. (The purpose of this procedure is to purge the exhaust system of excess smoke and soot);

8. Place the vehicle transmission in drive gear with the vehicle braking pedal firmly depressed so as to prevent movement of the vehicle during all segments of testing;

9. Rapidly depress the vehicle accelerator pedal to wide open throttle and keep it so depressed for a period of not less than three seconds nor more than 10 seconds after the engine speed stabilizes, then completely release the accelerator;

10. Repeat the procedure described in (c)9, above, twice. Allow the vehicle to idle in or out of drive gear for a period of not less than 15 seconds and not more than 30 seconds between test cycles;

11. Record the peak smoke opacity readings obtained in (c)9 and 10 above;

12. Determine the arithmetic mean of the three peak smoke opacity readings recorded in (c)11 above. If the difference between the values (given in percent smoke opacity) of the highest and lowest of the three peak smoke opacity readings is greater than five percent smoke opacity, the test shall be invalid, and may be repeated until the difference between these values is five percent smoke opacity or less. If the arithmetic mean of the three peak smoke opacity readings exceeds the standards set forth at N.J.A.C. 7:27–14.6(b), (c), (d), (e) or an alternative smoke opacity standard established pursuant to N.J.A.C. 7:27B–4.13, as applicable, the vehicle shall be deemed to have failed to pass the stall smoke opacity test.

(d) The testing procedures for the visible black smoke screening test, required pursuant to N.J.A.C. 7:27–14.5, shall be performed as follows:

1. Determine whether the vehicle's governor and automatic transmission, as applicable, are functioning properly. Do not proceed with the testing of a vehicle which is determined to have a disabled or an improperly functioning governor or automatic transmission until the governor or automatic transmission is repaired or a properly functioning governor or automatic transmission is installed;

2. If the vehicle is equipped with a manual transmission, place the transmission in neutral and release the clutch. If the vehicle is equipped with an automatic transmission and a low speed engine, place the gear selector in the park or neutral position. If the vehicle is equipped with an automatic transmission, but is not equipped with a low speed engine, place the gear selector in drive or low gear. For both manual and automatic transmission vehicles, depress the brakes firmly throughout the remainder of the test;

3. Observe all exhaust ports of the vehicle for the presence of visible black smoke in the exhaust emissions throughout the duration of the test;

4. Beginning with the accelerator pedal in the low idle position, rapidly accelerate the engine at wide open throttle and hold the accelerator pedal at wide open throttle for one to three seconds after the engine has achieved maximum governed RPM or, for vehicles with an automatic transmission, only, until the engine speed stabilizes while operating in a forward gear. Release the accelerator pedal and allow the engine to idle for 15 seconds while continuing to observe the exhaust emissions for visible black smoke. If black smoke is observed, the vehicle shall be deemed to have failed to pass the visible black smoke screening test.

Amended by R.1997 d.393, effective September 15, 1997 (operative October 7, 1997).
See: 29 N.J.R. 971(a), 29 N.J.R. 4108(a).
Rewrote section.

7:27B–4.4 Procedures for the visible smoke test and the idle test for gasoline-fueled motor vehicles

(a) The testing procedure for the visible smoke test, to be used to determine a gasoline-fueled motor vehicle's compliance with the standard set forth at N.J.A.C. 7:27–15.6(a) shall be performed as follows:

1. The vehicle shall be placed in neutral gear with all accessories off and the emergency or parking brake secured;

2. The engine speed shall be increased to an engine speed greater than the idle mode, and the exhaust emissions and crankcase emissions observed for visible continuous smoke; and

3. If there is visible smoke in the exhaust emissions or crankcase emissions for a period in excess of three consecutive seconds, the motor vehicle shall be determined to fail the smoke test.

(b) The testing procedure to be used to determine a motor vehicle's compliance with the exhaust emission standards set forth at N.J.A.C. 7:27–15.6(b)1 is the idle test and shall be performed as follows:

1. The engine shall be at normal operating temperature and not overheating (as determined by the vehicle's temperature gauge or temperature warning light, a boiling radiator, or other visual observation) with all accessories off;

2. With the engine operating at idle and transmission in neutral, the sample probe shall be inserted at least 10 inches into the exhaust outlet. If the motor vehicle's exhaust system prevents insertion to this depth, a tailpipe extension shall be used. For motor vehicles equipped with multiple exhaust pipes, exhaust gas measurements shall be taken from all exhaust pipes simultaneously;

3. The exhaust concentrations shall be measured as percent carbon monoxide and parts per million hydrocarbons after stabilized readings are obtained or at the end of 30 seconds, whichever occurs first; and

4. If the percent carbon monoxide or parts per million hydrocarbons recorded in (b)3 above exceeds the applicable standards specified in Table 1 at N.J.A.C. 7:27–15.6, the motor vehicle shall be determined to have failed (that is, not passed) the idle test.

Emergency amendment R.1995 d.409, effective June 29, 1995 (expires August 28, 1995).
See: 27 N.J.R. 2752(a).
Adopted concurrent proposal, R.1995 d.527, effective August 28, 1995 (operative October 27, 1995).
See: 27 N.J.R. 2752(a), 27 N.J.R. 3806(a).
Amended by R.1997 d.283, effective July 7, 1997 (operative August 11, 1997).
See: 29 N.J.R. 726(a), 29 N.J.R. 2826(b).
In (b)2, substituted "at idle" for "in the idle mode" and added second sentence.
Recodified from N.J.A.C. 7:27B–4.5 and amended by R.1997 d.393, effective September 15, 1997 (operative October 7, 1997).

See: 29 N.J.R. 971(a), 29 N.J.R. 4108(a).
Amended section name; in (a), inserted gasoline-fueled. Former section "Smoke opacity testing procedure for diesel-powered autobuses subject to the inspection rules and regulations of the New Jersey Department of Transportation" was repealed.

7:27B–4.5 Procedures for the 2,500 RPM test

(a) The testing procedure for the 2,500 RPM test, to be used to determine a motor vehicle's compliance with the exhaust emission standards set forth at N.J.A.C. 7:27–15.6(b)2, shall be performed as follows:

1. The motor vehicle shall be tested in as-received condition with all accessories off. Its engine shall be at normal operating temperature and not overheating (as determined by the vehicle's temperature gauge or temperature warning light, a boiling radiator, or other visual observation);

2. The sample probe shall be inserted into the motor vehicle's tailpipe to a minimum depth of 10 inches. If the motor vehicle's exhaust system prevents insertion to this depth, a tailpipe extension shall be used. For motor vehicles equipped with multiple exhaust pipes, exhaust gas measurements shall be taken from all exhaust pipes simultaneously;

3. For all pre–1996 model year vehicles, a tachometer or other device approved by the Department shall be used to measure engine speed. The tachometer or other device shall be attached to the motor vehicle in accordance with the tachometer or device manufacturer's instructions. For 1996 and newer model year vehicles, the OBD data link connector shall be used to monitor RPM. In the event that an OBD data link connector is not available or that an RPM signal is not available over the data link, a tachometer shall be used instead;

4. The vehicle's transmission shall be in park or neutral;

5. The vehicle engine speed shall be increased from idle to between 2200 and 2800 RPM and maintained at that level for the duration of the test, not to exceed 30 seconds. If the engine speed falls and remains below 2200 RPM or exceeds and remains above 2800 RPM for more than two consecutive seconds during the test period, the measured value shall be invalidated for that sampling period and the test duration extended accordingly. If any excursion outside of the allowable RPM range lasts for more than ten seconds, the test shall be invalidated, and another 2500 RPM test shall be initiated; and

6. Exhaust concentrations shall be measured as percent carbon monoxide and parts per million hydrocarbons after stabilized readings are obtained or at the end of 30 seconds, whichever occurs first.

(b) A determination shall be made that the motor vehicle has passed the 2500 RPM test if the measurements made of the hydrocarbons and carbon monoxide in the exhaust emissions indicate that the concentration of each is less than or equal to the applicable standards specified in Table 2 at N.J.A.C. 7:27–15.6.

Emergency New Rule, R.1995 d.409, effective June 29, 1995 (expires August 28, 1995).
See: 27 N.J.R. 2752(a).
Adopted concurrent proposal, R.1995 d.527, effective August 28, 1995 (operative October 27, 1995).
See: 27 N.J.R. 2752(a), 27 N.J.R. 3806(a).
Amended by R.1997 d.283, effective July 7, 1997 (operative August 11, 1997).
See: 29 N.J.R. 726(a), 29 N.J.R. 2826(b).
In (a), inserted "performed" preceding "as follows:"; and in (a)3, inserted "For all pre–1996 model year vehicles,", and added last two sentences.
Recodified from N.J.A.C. 7:27B–4.6 by R.1997 d.393, effective September 15, 1997 (operative October 7, 1997).
See: 29 N.J.R. 971(a), 29 N.J.R. 4108(a).
Former section recodified as N.J.A.C. 7:27B–4.4.

Case Notes

Private inspection center license not suspended; licensee did not improperly certify repairs. Division of Motor Vehicles v. Joe's Auto Service, 92 N.J.A.R.2d (MVH) 1.

7:27B–4.6 Procedures for the ASM5015 test

(a) The testing procedure for the ASM5015 test, to be used to determine a motor vehicle's compliance with the exhaust emission standards set forth at N.J.A.C. 7:27–15.6(b)3 shall consist of an ASM5015 test optionally followed by a second chance purge test.

(b) The motor vehicle shall be tested pursuant to (a) above in as-received condition with all accessories off. Its engine shall be at normal operating temperature and not overheating (as determined by the vehicle's temperature gauge or temperature warning light, a boiling radiator, or other visual observation).

(c) The ASM5015 test shall be initiated as follows:

1. The dynamometer shall be warmed up, in stabilized operating condition, adjusted and calibrated in accordance with the procedures recommended by the dynamometer manufacturer;

2. The motor vehicle shall be positioned on the dynamometer and, if necessary, secured according to protocol recommended by the dynamometer manufacturer;

3. The evaporative purge test apparatus shall be connected and the procedures for the evaporative purge test shall be performed as specified in N.J.A.C. 7:27B–4.11;

4. The dynamometer shall be set at a load setting determined by the following equation:

$$L = IW/250$$

where:

L = load, in horsepower; and

IW = vehicle inertia weight, in pounds;