

Street, Etobicoke, Ontario, Canada. Applicant's representative: J. P. Vermette, 7887 Grenache Street, Ville d'Anjou, Quebec, Canada. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Muriatic acid*, in bulk, in tank vehicles, from the port of entry on the international boundary line between the United States and Canada located at or near Port Huron, Mich., to Ecorse, Mich., restricted to the transportation of traffic having an immediate prior movement in foreign commerce in local, through, single-line service for 180 days. Supporting shipper(s): Allied Chemical Canada Ltd., 237 Hymus Blvd., Point Claire, Quebec, Canada. Send protests to: George M. Parker, District Supervisor, Interstate Commerce Commission, Bureau of Operations, 910 Federal Building, 111 West Huron Street, Buffalo, N.Y. 14202.

No. MC 142548 (Sub-No. 3TA) (correction), filed May 16, 1977, published in the FEDERAL REGISTER issue of June 8, 1977, and republished as corrected this issue. Applicant: STALEY EXPRESS, INC., 2501 N. Brush College Road, Decatur, Ill. 62521. Applicant's representative: Fritz R. Kahn, Suite 1000, 1680 L Street NW., Washington, D.C. 20036. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Iron castings*, in steel bins, (1) from Decatur, Ill. to Toledo and Dayton, Ohio, and Kokomo, Ind., and (2) from Decatur, Ill. to Lima, Ohio, with stop in transit, permitted for inspection at Cleveland, Ohio. Both (1) and (2) above restricted to the transportation of shipments from the plantsites or storage facilities of Wagner Castings Co., at Decatur, Ill., under a continuing contract with Wagner Castings Co. for 180 days. Supporting shipper(s): C. E. Allison, Vice President-Administration, Wagner Castings Co., P.O. Box 1319, Decatur, Ill. 62525. Send protests to: District Supervisor Harold C. Jolliff, Interstate Commerce Commission, P.O. Box 2418, Springfield, Ill. 62705. The purpose of this republication is to add "Send protests to" which was previously omitted.

By the Commission,

H. G. HOMME, JR.,
Acting Secretary.

[FR Doc. 77-18522 Filed 6-27-77; 8:45 am]

[Notice No. 83]

MOTOR CARRIER TEMPORARY AUTHORITY APPLICATIONS

JUNE 23, 1977.

Important notice: The following are notices of filing of applications for temporary authority under Section 210a(a) of the Interstate Commerce Act provided for under the provisions of 49 CFR 1131.3. These rules provide that an original and six (6) copies of protests to an application may be filed with the field official named in the FEDERAL REGISTER

publication no later than the 15th calendar day after the date the notice of the filing of the application is published in the FEDERAL REGISTER. One copy of the protest must be served on the applicant, or its authorized representative, if any, and the protestant must certify that such service has been made. The protest must identify the operating authority upon which it is predicated, specifying the "MC" docket and "Sub" number and quoting the particular portion of authority upon which it relies. Also, the protestant shall specify the service it can and will provide and the amount and type of equipment it will make available for use in connection with the service contemplated by the TA application. The weight accorded a protest shall be governed by the completeness and pertinence of the protestant's information.

Except as otherwise specifically noted, each applicant states that there will be no significant effect on the quality of the human environment resulting from approval of its application.

A copy of the application is on file, and can be examined at the Office of the Secretary, Interstate Commerce Commission, Washington, D.C., and also in the ICC Field Office to which protests are to be transmitted.

MOTOR CARRIERS OF PROPERTY

No. MC 3281 (Sub-No. 8TA), filed June 9, 1977. Applicant: POWELL TRUCK LINE, INC., 300 S. Main St., Searcy, Ark. 72143. Applicant's representative: A. Doyle Cloud, Jr., 2008 Clark Tower, 5100 Poplar Ave., Memphis, Tenn. 38137. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *General commodities*, except those of unusual value, Classes A and B explosives, household goods as defined by the Commission, commodities in bulk, and commodities requiring special equipment, between Forrest City, Ark., and the plantsite of American Greetings Corp., at or near McCrory, Ark., from Forrest City, Ark., over Arkansas Highway 1 to the intersection of U.S. Highway 64 at or near Wynne, Ark., thence over U.S. Highway 64 to junction U.S. 64-B, thence over U.S. 64-B to the plantsite of American Greetings Corp., and return over the same route, restricted to transportation of shipments with an immediately prior or subsequent movement by rail, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: American Greetings Corp., McGroory, Ark. 72101. Send protests to: District Supervisor William H. Land, Jr., 3108 Federal Office Building, 700 West Capitol, Little Rock, Ark. 72201.

No. MC 61396 (Sub-No. 331TA), filed June 9, 1977. Applicant: HERMAN BROS., INC., 2565 St. Marys Avenue, P.O. Box 189, Omaha, Nebr. 68101. Applicant's representative: John E. Smith II (same address as applicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Liquid fertilizer*, in

bulk, in tank vehicles, from the plantsite and storage facilities of Agriculture Chemicals, Inc., at or near Old Monroe, Mo., to points in Illinois, for 180 days. Supporting shipper(s): James S. Bremmer, President, Agriculture Chemicals, Inc., P.O. Box 155, Old Monroe, Mo. 63369. Send protests to: Carroll Russell, District Supervisor, Interstate Commerce Commission, Suite 620, 110 North 14th Street, Omaha, Nebr. 68102.

No. MC 78276 (Sub-No. 7TA), filed June 6, 1977. Applicant: MAZZEO & SONS EXPRESS, 311 South River Street, Hackensack, N.J. 07601. Applicant's representative: George A. Olsen, 69 Tonnele Avenue, Jersey City, N.J. 07306. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: (1) *Wearing apparel, materials, supplies and equipment*, used in the manufacture and sale of wearing apparel, between points in Baltimore, Md., Commercial Zone, points in New Jersey, New York, N.Y., Commercial zone, Nassau, Rockland, and Suffolk Counties, N.Y., points in Philadelphia, Pa., Commercial zone, and York, Pa., and also points in Wilmington, Del., Commercial zone, on the one hand, and, on the other points in the states of Georgia, North Carolina and South Carolina, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): There are approximately ten (10) statements of support attached to the application which may be examined at the Interstate Commerce Commission in Washington, D.C. or copies thereof may be examined at the field office named below. Send protests to: Joel Marrows District Supervisor, Interstate Commerce Commission, 9 Clinton Street, Newark, N.J. 07102.

No. MC 87511 (Sub-No. 20TA), filed June 6, 1977. Applicant: SAIA MOTOR FREIGHT LINE, INC., P.O. Box 10157, Station 1, Houma, La. 70360. Applicant's representative: Philip Robinson, P.O. Box 2207, Austin, Tex. 78768. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *General commodities*, (except those of unusual value, Class A and B explosives, household goods as defined by the Commission, commodities in bulk, and commodities which because of size or weight require the use of special equipment), serving the compressor station of United Gas Pipe Line Company located near Vinton, La., as an off-route point in connection with carrier's presently authorized regular route operations, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): United Gas Pipe Line Company, P.O. Box 1478, Houston, Tex. 77001. Send protests to: Ray C. Armstrong, Jr., District Supervisor, 701 Loyola Ave., 9038 Federal Building, New Orleans, La. 70113.

No. MC 88380 (Sub-No. 26TA), filed June 9, 1977. Applicant: REB TRANSPORTATION, INC., 2400 Cold Springs

Rd., Box 4309, Fort Worth, Tex. 76106. Applicant's representative: John L. Payne, 2400 Cold Springs Rd., Box 4309, Fort Worth, Tex. 76106. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Iron and steel bar joists, rods, beams, and channels*, from the plantsite of TEX-ARK Joist Company at or near Hope, Ark., to points in Colorado, Kansas, Louisiana, Missouri, New Mexico, Oklahoma, and Tex., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): Tex-Ark Joist Company, P.O. Box TAJ, Hope, Ark. 71801. Send protests to: Robert J. Kirspeil District Supervisor, Room 9A27 Federal Building, 819 Taylor Street, Fort Worth, Tex. 76102.

No. MC 95876 (Sub-No. 202TA), filed June 9, 1977. Applicant: ANDERSON TRUCKING SERVICE, INC., 203 Cooper Avenue North, St. Cloud, Minn. 56301. Applicant's representative: Robert D. Givold, 1000 First National Bank Bldg., Minneapolis, Minn. 55402. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Composition board, plywood, accessories and materials*, used in the installation and sale thereof, from the plant and warehouse sites of Abitibi Corporation, Chicago, Ill., to points in Wisconsin, Iowa and Minn., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): Abitibi Corporation, 3250 W. Big Beaver Road, Troy, Mich. 48064. Send protests to: Marlon L. Cheney, Transportation Assistant, Interstate Commerce Commission, Bureau of Operations, 414 Federal Building & U. S. Court House, 110 S. 4th Street, Minneapolis, Minn. 55401.

No. MC 100666 (Sub-No. 349TA), filed June 10, 1977. Applicant: MELTON TRUCK LINES, INC., P. O. Box 7666, 1129 Grimmer Dr., Shreveport, La. 71107. Applicant's representative: Wilburn L. Williamson, 3535 N.W. 58th Street, 280 National Foundation Life Bldg., Oklahoma City, Okla. 73112. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Pottery and plaster products*, from Comanche, Tex., and Oxford, Miss., to points in the United States for 180 days. Supporting shipper(s): Jim Ratcliff, db/a Janco Manufacturing Co., P.O. Box 443, Comanche, Tex. Send protests to: Ray C. Armstrong, Jr., District Supervisor, 701 Loyola Avenue, 9038 Federal Bldg., New Orleans, La. 70113.

No. MC 105566 (Sub-No. 148TA), filed June 8, 1977. Applicant: SAM TANKSLEY TRUCKING, INC., P.O. Box 1120, Cape Girardeau, Mo. 63701. Applicant's representative: Thomas F. Kilroy, 6901 Old Keene Mill Road, Suite 406, Springfield, Va. 22150. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Plastic materials, anti-freeze, anti-freeze preparations, plastic pellets, resins, lumps*

or granules and chemical compounds, from Ottawa, Ill.; Gary, Ind.; Chicago, Ill.; Calumet City, Ill., and Hammond, Ind., to points in Arizona, California, Nevada, Utah, Idaho, Oregon, Washington, New Mexico and Texas, for 180 days. Supporting shipper(s): Northern Petrochemical Company, 2350 E. Devon Avenue, Des Plaines, Ill. 60018. Cosden Oil & Chemical Company, P. O. Box 2159, Dallas, Tex. 75221. Borg-Warner Chemicals, International Center, Parkersburg, W. Va. 26101. Send protests to: J. P. Werthmann District Supervisor, Interstate Commerce Commission, Bureau of Operations, Room 1465, 210 N. 12th Street, St. Louis, Mo. 63101.

No. MC 106920 (Sub-No. 71TA), filed June 7, 1977. Applicant: RIGGS FOOD EXPRESS, INC., P.O. Box 26, West Monroe St., New Bremen, Ohio 45869. Applicant's representative: Betty Kominsk (same address as applicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Candy and confectionery*, in mechanically refrigerated equipment, except in bulk, from Carol Stream and points within the Chicago, Illinois Commerce Zone, to points within the State of Ohio, Pennsylvania, New York, Maryland, West Virginia, Virginia, Delaware, District of Columbia, New Jersey, Connecticut, Massachusetts, Rhode Island, Maine, Vermont, and New Hampshire, restricted to the plant site and storage facilities of E. J. Brach & Sons, and restricted to traffic originating at named origin and destined to named destination, for 180 days. Supporting shipper: E. J. Brach & Sons, 4656 W. Kinzie St., Chicago, Ill. 60644. Send protests to: Keith D. Warner, District Supervisor, Bureau of Operations, Interstate Commerce Commission, 313 Federal Office Building, 234 Summit St., Toledo, Ohio 43604.

No. MC 107496 (Sub-No. 1086TA), filed June 13, 1977. Applicant: RUAN TRANSPORT CORPORATION, 3200 Ruan Center, 666 Grand Avenue, Des Moines, Iowa 50309. Applicant's representative: E. Check (same address as applicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Mixed fertilizer solution*, in bulk, from Eau Claire, Mich., to points in Minnesota, Illinois, Indiana, and Michigan, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): St. Lawrence Corporation, 2505 Ardmore, S.E. Grand Rapids, Mich. 49501. Send protests to: Herbert W. Allen, District Supervisor, Bureau of Operations, Interstate Commerce Commission, 518 Federal Building, Des Moines, Iowa 50309.

No. MC 110012 (Sub-No. 35TA), filed June 9, 1977. Applicant: ROY WIDENER MOTOR LINES, INC., 707 North Liberty Hill Rd., P.O. Box 68, Morristown, Tenn. 37814. Applicant's representative: John R. Sims, Jr., 915 Pennsylvania Building, 425 13th St., N.W., Washington, D.C.

20423. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: (1) *New furniture*, from the plantsites of Lea Industries, Incorporated, Division of Sperry Hutchinson Co., located at or near Richmond and Kenbridge, Va., and Waynesville, N.C. to points in Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas, (2) returned shipments of *new furniture*, from the above named destination states to the above named origins, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Lea Industries, Incorporated, Division of Sperry-Hutchinson Co., P.O. Box 25476, Richmond, Va. 23260. Send protests to: Joe J. Tate, District Supervisor, Bureau of Operations, Interstate Commerce Commission, Suite A-422 U.S. Court House, 801 Broadway, Nashville, Tenn. 37203.

No. MC 114632 (Sub-No. 114TA), filed June 9, 1977. Applicant: APPLE LINES, 212 S.W. Second St., P.O. Box 287, Madison, S. Dak. 57042. Applicant's representative: Robert T. Meisner (same address as applicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Meats, meat products, and meat by-products, and articles distributed by meat packinghouses*, as described in Sections A and C of Appendix I to the report in Descriptions in Motor Carrier Certificates, 61 M.C.C. 209 and 766 (except hides and commodities in bulk), from Payette, Idaho to Pueblo and Denver, Colo., Golden Valley, Minn., Des Moines, Iowa, Milwaukee, Wis., Sioux City, Iowa, Omaha, Nebr., and Fargo, N. Dak., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Wells & Davies, Inc., P.O. Box 219, Payette, Idaho 83661, Earl Tromberg, Plant Manager. Send protests to: J. L. Hammond, District Supervisor, Interstate Commerce Commission, Bureau of Operations, Rm. 455, Federal Building, Pierre, S. Dak. 57501.

No. MC 115654 (Sub-No. 64TA), filed June 9, 1977. Applicant: TENNESSEE CARTAGE CO., INC., P.O. Box 1193, No. 1 Candy Lane, Nashville, Tenn. 37202. Applicant's representative: Henry E. Seaton, 915 Pennsylvania Building, 13th & Pennsylvania Ave., N.W., Washington, D.C. 20004. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Confectionery and confectionery products*, in mechanically refrigerated equipment, (except in bulk), from the plantsite and warehouse facilities of M&M/Mars, a division of Mars, Inc., at or near Little Rock, Ark., to points on and west of the Tennessee River in Tenn., and Ky., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): M&M/Mars, a division of Mars, Inc., High Street, Hackettstown, N.J. 07840. Send protests to: Joe J. Tate.

District Supervisor, Bureau of Operations, Interstate Commerce Commission, Suite A-422, U.S. Court House, 801 Broadway, Nashville, Tenn. 37203.

No. MC 115654 (Sub-No. 65TA), filed June 9, 1977. Applicant: TENNESSEE CARTAGE CO., INC., P.O. Box 1193, No. 1 Candy Lane, Nashville, Tenn. 37202. Applicant's representative: Henry E. Seaton, 915 Pennsylvania Bldg., Pennsylvania Avenue and 13th St., N.W., Washington, D.C. 20004. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Confectionery* in mechanically refrigerated equipment, (except in bulk), from the plantsite and storage facilities of M&M/Mars, a division of Mars Inc., at or near Chicago, Ill., to points in Ohio, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): M&M/Mars, A division of Mars, Inc. High Street, Hackettstown, N.J. 07840. Send protests to: Joe J. Tate, District Supervisor, Bureau of Operations, Interstate Commerce Commission, Suite A-422, U.S. Court House, 801 Broadway, Nashville, Tenn. 37203.

No. MC 116073 (Sub-No. 356TA), filed June 9, 1977. Applicant: BARRETT MOBILE HOME TRANSPORT, INC., 1825 Main Avenue, P.O. Box 919, Moorhead, Minn. 56560. Applicant's representative: John C. Barrett, P.O. Box 919, Moorhead, Minn. 56560. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Trailers*, designed to be drawn by passenger automobiles, and buildings, complete or in sections, from the plantsite of Continental Spacemaster Corp., at or near Elkhart, Ind., to all points in the states of Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Ohio and Wisconsin, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): Continental Spacemaster Corporation, 25702 Miner Street, Elkhart, Ind. 46514. Send protests to: Ronald R. Mau, District Supervisor, Bureau of Operations, Interstate Commerce Commission, P.O. Box 2340, Fargo, N. Dak. 58102.

No. MC 117633 (Sub-No. 3TA), filed June 8, 1977. Applicant: BLUE BIRD CAB CO., INC., 502-504 North Barry Street, Olean, N.Y. 14760. Applicant's representative: Ronald W. Malin, Bankers Trust Building, Jamestown, N.Y. 14701. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Railroad crews and their equipment*, in vehicles limited to eleven (11) passengers or less, between Niagara, Erie, Chautauqua and Cattaraugus Counties, N.Y., on the one hand, and, on the other, Clinton Potter, Cameron and McKean Counties, Pa., under a continuing contract, or contracts, with Consolidated Rail Corporation, for 180 days. Supporting shipper(s): Consolidated Rail Corporation, P.O. Box 42, Olean, N.Y. 14760. Send protests to: George M. Parker, District

Supervisor, Interstate Commerce Commission, Bureau of Operations, 910 Federal Building, 111 West Huron Street, Buffalo, N.Y. 14202.

No. MC 119789 (Sub-No. 357TA), filed June 10, 1977. Applicant: CARAVAN REFRIGERATED CARGO, INC., P.O. Box 6188, Dallas, Tex. 75222. Applicant's representative: James K. Newbold, Jr. (same address as applicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Liquid plastic*, in containers in mechanically refrigerated equipment, from Riverside, Calif., to Illinois, Indiana, Iowa, Louisiana, Michigan, Minnesota, Missouri, Nebraska, New Mexico, Oregon, Texas, and Washington, Carbondale, Ill., Evansville, Ind., Holstein, Spencer, Marshalltown, Aldonna, Iowa, New Orleans, La., Detroit, Mich., Minneapolis, Roger, Minn., St. Louis, Mo., David City, Nebr., Albuquerque, N. Mex., Portland, Ore., Houston, Tex., Arlington, Pasco, Wash., for 180 days. Supporting shipper: Foam Systems Co., 3640 Chicago Ave., P.O. Box 5347, Riverside, Calif. 92507. Send protests to: Opal M. Jones, Trans. Asst., Interstate Commerce Commission, 1100 Commerce St., Rm. 13C12, Dallas, Tex. 75242.

No. MC 124048 (Sub-No. 26TA), filed June 2, 1977. Applicant: SCHWERMAN TRUCKING CO., 611 South 28 Street, Milwaukee, Wis. 53215. Applicant's representative: Richard H. Prevette (same address as applicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Vegetable oils*, in bulk, in tank vehicles, from Macon, Ga., to Grand Island, Nebr., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): The Procter & Gamble Distributing Company, P.O. Box 599, Cincinnati, Ohio. 45201. (William J. Payne, Analyst) Send protests to: John E. Ryden, District Supervisor, Interstate Commerce Commission, Bureau of Operations, U.S. Federal Building and Court House, 517 East Wisconsin Avenue, Room 619, Milwaukee, Wis. 53202.

No. MC 128527 (Sub-No. 85TA), filed June 9, 1977. Applicant: MAY TRUCKING COMPANY, P.O. Box 398, Payette, Idaho 83661. Applicant's representative: C. Marvin May (same address as applicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: (a) *Such merchandise as is dealt in by wholesale, retail, and chain grocery and food business houses*, and (b) *equipment, materials, and supplies used in the conduct of such businesses*, in Portland, Salem, Hillsboro, Forest Grove, Albany, Eugene, Stayton and Hood River, Ore., and Seattle, Kent, Tacoma, Bellingham, Bellevue, Vancouver, Yakima, Markham, Sunnyside, Arlington, Puyallup, Kennewick, La Conner, Walla Walla, Selah and Prosser, Wash., to the warehouse facilities of American Strevell Inc., located at Boise, Idaho, for 180 days. Applicant has also filed an underlying ETA seeking up

to 90 days of operating authority. Supporting shipper: American Strevell, Inc., 506 S. 11th, Boise, Idaho, 83706. Send protests to: Barney L. Hardin, District Supervisor, Interstate Commerce Commission, 550 W. Fort St. Box 07, Boise, Idaho 83724.

No. MC 128592 (Sub-No. 9TA), filed June 8, 1977. Applicant: KLM, INC., P.O. Box 162, Railroad Avenue, Center, Tex. 79535. Applicant's representative: Donald B. Morrison, 1500 Deposit Guaranty Plaza, Jackson, Miss. 39205. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: (1) *Frozen foods*, from points in Pennsylvania, Wisconsin and Texas, to the distribution facilities of the Burger King Corporation located at Greensboro, N.C.; Syosett, N.Y.; Bellmawr, N.J.; Atlanta, Ga.; Miami, Fla.; Minneapolis, Minn.; Detroit, Mich.; Solon, Ohio; Santa Fe Springs, Calif.; Kansas City, Mo.; Denver, Colo.; Houston and Arlington, Tex.; and Boston, Mass.; (2) *Such commodities as are sold or used by operators or restaurant chains* (except commodities in bulk), from Miami, Fla., to the distribution facilities of the Burger King Corporation located at Greensboro, N.C.; Syosett, N.Y.; Bellmawr, N.J.; Atlanta, Ga.; Minneapolis, Minn.; Detroit, Mich.; Solon, Ohio; Santa Fe Springs, Calif.; Kansas City, Mo.; Denver, Colo.; Houston and Arlington, Tex.; and Boston, Mass. The transportation service to be performed under (1) and (2) shall be pursuant to a continuing contract, or contracts, with the Burger King Corporation, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): Burger King Corporation—District Division, P.O. Box 520843, Miami, Fla. 33152. Send protests to: Alan C. Tarrant, District Supervisor, Interstate Commerce Commission, Room 212, 145 East Amite Building, Jackson, Miss. 39201.

No. MC 128801 (Sub-No. 3TA), filed June 10, 1977. Applicant: RONALD SHREINER, R.D. No. 1, Labanon, Pa. 17042. Applicant's representative: John M. Musselman, P.O. Box 1146, 410 North Third St., Harrisburg, Pa. 17108. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Non-ferrous metals and alloys, and scrap non-ferrous metals and scrap non-ferrous metal articles and alloys*, between Columbia, Pa., on the one hand, and, on the other, Fort Riley, Kans., and Fort Sill, Okla., and points in Arkansas, Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Texas and Wisconsin, under a continuing contract with Colonial Metals Co., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Colonial Metals Co., P.O. Box 311, Columbia, Pa. 17512. Send protests to: Charles F. Myers, District Supervisor, Bureau of Operations, Interstate Commerce Commission, 278 Federal Building, P.O. Box 869, Harrisburg, Pa. 17108.

No. MC 129963 (Sub-No. 6TA), filed June 13, 1977. Applicant: Fann McKelvey, d.b.a. McKELVEY TRUCKING, 5420 W. Missouri, Glendale, Ariz. 85301. Applicant's representative: A. Michael Bernstein, 1441 E. Thomas Road, Phoenix, Ariz. 85014. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Lettuce cartons*, from Los Angeles, Calif., to Center and Alamosa, Colo., under a continuing contract, or contracts, with Desert Supply Company, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): Desert Supply Company, 1055 Walnut, Yuma, Ariz. 85364. Send protests to: Andrew V. Baylor, District Supervisor, Interstate Commerce Commission, Room 3427 Federal Bldg., 230 N. First Avenue, Phoenix, Ariz. 85025.

No. MC 134734 (Sub-No. 34TA), filed June 10, 1977. Applicant: NATIONAL TRANSPORTATION, INC., P.O. Box 37465, Omaha, Nebr. 68137. Applicant's representative: Joseph Winter, 33 N. LaSalle St., Chicago, Ill. 60602. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Motor vehicle parts, tools, and related advertising materials*, (a) from the plantsite and facilities of Moog Automotive, Inc., at or near Creve Coeur, Mo., to Reno, Nev., and (b) from the facilities of D.J.T. Realty Co. at Reno, Nev., to points in Orange, Riverside, Los Angeles, San Bernardino, San Diego, San Francisco, San Mateo, Santa Clara, Contra Costa, Sacramento, Fresno, Kern, Tulare, and San Joaquin Counties, Calif., under a continuing contract or contracts with Moog Automotive, Inc., for 180 days. Supporting shipper: William L. Mussbaum, Asst. General Counsel, Moog Automotive, Inc., Box 7224, St. Louis, Mo. 63177.

No. MC 135539 (Sub-No. 8TA), filed June 6, 1977. Applicant: FARM SERVICE & SUPPLIES, INC., P.O. Box 5351, Evansville, Ind. 47715. Applicant's representative: Margie Market, 305 Van Buren St., Marengo, Ill. 60152. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Grain bins, storage tanks, fans, heaters, augers, dryers, pre-engineered steel buildings*, and all related parts and accessories between the plantsite of Superior Equipment Manufacturing Co., Division of Tiffany Industries, Inc., Matoon, Ill., and all points in the states of Iowa, Indiana, Ohio, Kentucky and Tennessee, under a continuing contract with Superior Equipment Manufacturing Co., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Superior Equipment Manufacturing Co., Div. of Tiffany Industries, Inc. 1321 S. Nineteenth St., Matoon, Ill. 61938. Send protests to: William S. Ennis, D/S Interstate Commerce Commission, Federal Bldg., and U.S. Courthouse, 46 East Ohio St., Rm. 429 Indianapolis, Ind. 46204.

No. MC 136220 (Sub-No. 42TA), filed June 9, 1977. Applicant: Roy Sullivan, d.b.a. SULLIVAN TRUCKING CO., P.O. Box 2164, Ponca City, Okla. 74601. Applicant's representative: G. Timothy Armstrong, 6161 N. May Avenue, Oklahoma City, Okla. 73112. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Alfalfa pellets and alfalfa meal*, in bulk, in dump vehicles, from points in Sumner County, Kans., to points in Arkansas and Oklahoma, for 180 days. Supporting shipper(s): Western Alfalfa Corporation, P.O. Box 69, Shawnee Mission, Kans. 66201. Send protests to: Joe Green District Supervisor, Room 240, Old Post Office Bldg., 215 Northwest Third Street, Oklahoma City, Okla. 73102.

No. MC 138036 (Sub-No. 9TA), filed June 8, 1977. Applicant: J & S, INC., P.O. Box 288, Indianola, Pa. 15051. Applicant's representative: William A. Gray, 2310 Grant Building, Pittsburgh, Pa. 15219. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Such commodities as are dealt in by retail drug and variety stores, and equipment, materials, and supplies used in the conduct of such business (except commodities in bulk)*, between the facilities of Thrift Drug Division of J.C. Penney Company, Inc., in Atlanta Southern Industrial Park, Morrow (Clayton County), Ga., on the one hand, and, on the other, points in California, under a continuing contract or contracts with Thrift Drug Division of J.C. Penney Company, Inc., of New York, N.Y. for 180 days. Supporting shipper: Thrift Drug Division of J.C. Penney Co., Inc. 615 Alpha Drive, Pittsburgh, Pa. 15238. Send protests to: John J. England, District Supervisor, Interstate Commerce Commission, 2111 Federal Bldg., 1000 Liberty Ave., Pittsburgh, Pa. 15222.

No. MC 139495 (Sub-No. 244TA), filed June 13, 1977. Applicant: NATIONAL CARRIERS, INC., P.O. Box 1358, 1501 E. 8th Street, Liberal, Kans. 67901. Applicant's representative: Frederic J. Coffman, Peterson, Bowman, Coffman & Larsen, P.O. Box 81849, Lincoln, Nebr. 68501. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Plastic pipe fittings and connectors*, from the facilities of ITT-Grinnell at Temple, Tex., to points in the United States, (except Alaska, Hawaii and Texas), restricted to traffic originating at the above facilities, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): ITT-Grinnell Corporation, P.O. Box 687, Temple, Tex. 76501. Send protests to: M. E. Taylor District Supervisor, Interstate Commerce Commission, Suite 101 Litwin Building, Wichita, Kans. 67202.

No. MC 142268 (Sub-No. 15TA), filed June 7, 1977. Applicant: GORSKI BULK TRANSPORT, INC., R.R. No. 4, Harrow, Ontario, Canada. Applicant's representative: William B. Elmer, 21635 East Nine

Mile Road, St. Clair Shores, Mich. 48080. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Water and sewage treatment chemicals*, in bulk, in tank vehicles, from Detroit, Michigan and points in its commercial zone, to the international boundary line between the United States and Canada, at points in Michigan, for furtherance to points in Ontario, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): (1) West Windsor Pollution Control Plant, W. J. Newman Superintendent, 4155 Obilway Parkway, Windsor, Ontario, Canada. (2) Ontario Ministry of the Environment, Area Superintendent H. F. Sanger, Box 298, Kingsville, Ontario, N9Y 2E9. (3) Windsor Utilities Commission, Superintendent, Water Division, E. A. Loft, 787 Ouellette Avenue, Windsor, Ontario, N9A 5T7. (4) Amherstburg Water Filtration Plant, Superintendent Louis Singer, Amherstburg, Ontario. (5) Harrow Water Filtration Plant, Superintendent Ernie Johnston, Box 909, Harrow, Ontario, Canada. (6) Ministry of the Environment, Superintendent Richard Fletcher, RR No. 1, Blenheim, Ontario. Send protests to: James A. Augustyn District Supervisor, Interstate Commerce Commission, 1110 Broderick Tower, 10 Witherell Avenue, Bureau of Operations, Detroit, Mich. 48226.

No. MC 142291 (Sub-No. 2TA), filed June 6, 1977. Applicant: MDI, INC., 6202 Concord Blvd. East, Inver Grove Heights, Minn. 55075. Applicant's representative: Robert P. Sack, P.O. Box 8010, West St. Paul, Minn. 55118. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Alcoholic liquors and wines*, (except in bulk), from points in Kentucky to Long Prairie, Minn., under a continuing contract, or contracts, with Minnesota Distillers, Inc., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): Minnesota Distillers, Inc. Long Prairie, Minn. Send protests to: Mrs. Marion L. Cheney, Transportation Assistant, Interstate Commerce Commission, Bureau of Operations, 414 Federal Building and U.S. Court House, 110 S. 4th Street, Minneapolis, Minn. 55401.

No. MC 143163 (Sub-No. 2TA), filed May 16, 1977. Applicant: RICHARDSON TRUCKING INC., 330 East 8th St., P.O. Box 967, Greeley, Colo. 80631. Applicant's representative: Western Traffic Service, 5900 West Colfax Ave., Suite 20, P.O. Box 14006, Denver, Colo. 80214. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Meat indible meat and meat by-products (except hides and commodities in bulk, in tank vehicles)*, used as, or in the manufacture of animal feed and feed ingredients, from Greeley, Colo., and its commercial zone to Fort Dodge and Des Moines, Iowa; Independence, Kansas City, and St. Joseph, Mo.; Forest

Grove, Hillsboro, and Portland, Oreg.; and Jefferson, Wis., and their commercial zones, under a continuing contract with J. R. Nylen Ltd. and their Man Handling Company Division, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: J. R. Nylen Ltd., and their Man Handling Company Division, P.O. Box 1314, Sioux City, Iowa 51102. Send protests to: Roger L. Buchanan, Dist. Supervisor, Interstate Commerce Commission, 721 19th St. 492 U.S. Customs House, Denver, Colo. 80202.

No. MC 143359 (Sub-No. 1TA), filed June 8, 1977. Applicant: HELEN McNAY, d/b/a. McNAY TRUCK LINE, R. R. No. 8, Quincy, Ill. 62301. Applicant's representative: Robert T. Lawley, 300 Reisch Building, Springfield, Ill. 62701. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Carbonated beverages*, from Quincy, Ill., to Burlington, Iowa for the account of Pepsi-Cola Quincy Bottling Co., Quincy, Ill., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): Gordon Cornwell, Executive Vice President, Pepsi-Cola Quincy Bottling Co., 1121 Locust Street, Quincy, Ill. 62301. Send protests to: Harold C. Jolliff, District Supervisor, Interstate Commerce Commission, P.O. Box 2418, Springfield, Ill. 62705.

No. MC 143367TA, filed June 13, 1977. Applicant: ORANGEBURG RED-MIX CONCRETE, INC., P.O. Box 706, Orangeburg, S.C. 29115. Applicant's representative: Frank A. Graham, Jr., 707 Security Federal Bldg., Columbia, S.C. 29201. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Mill scale*, in bulk, in dump vehicles, from Groft, N.C., to Orangeburg, S.C., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): Paul Blum Company, Inc., 189 Van Rensselaer Street, Buffalo, N.Y. 14210. Send protests to: E. E. Strotheid, District Supervisor, Interstate Commerce Commission, Room 302, 1400 Pickens Street, Columbia, S.C. 29201.

No. MC 143368TA, filed June 7, 1977. Applicant: WALTER D. BROOKS, 447 Range Road, Cumberland, Maine 04021. Applicant's representative: John G. Feehan, Hewes, Culley & Feehan, One Canal Plaza, Portland, Maine 04112. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Petroleum products*, in bulk, in tank vehicles, from Portland and South Portland, Maine to Portsmouth, Dover, Durham, Newington, Gonic and Rochester, N.H., for 180 days. Supporting shipper(s): Sunmark Industries, Division of Sun Oil Co. of Pennsylvania, P.O. Box 7368-19101, 1845 Walnut Street, Philadelphia, Pa. 19103. Send

protests to: Donald G. Weiler, District Supervisor, Bureau of Operations, Interstate Commerce Commission, 76 Pearl Street, Room 307, Portland, Maine 04111.

No. MC 143369TA, filed June 9, 1977. Applicant: ON-A-WAY TRUCKING, INC., Route 3, Box 426C, Molalla, Oreg. 97038. Applicant's representative: John A. Anderson, 200 S.W. Market Street, Suite 1440, 200 Market Building, Portland, Oreg. 97201. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Woodchips and hog fuel*, from points in Benton, Polk and Yamhill Counties, Oreg., to Longview, Wash., under a continuing contract, or contracts, with Wilson, Wilson & Wilson, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): Wilson, Wilson & Wilson, 22625 Jennie Road, Lyons, Oreg. Send protests to: A. E. Odoms, District Supervisor, Bureau of Operations, Interstate Commerce Commission, 114 Pioneer Courthouse, 555 S.W. Yamhill Street, Portland, Oreg. 97204.

No. MC 143370TA, filed June 9, 1977. Applicant: H. D. JORDAN AND EMMETT O. MCKENZIE, d/b/a EMPIRE TRUCKING COMPANY, P.O. Box 206, Old Washington, Ohio. 43768. Applicant's representative: E. H. van Deusen, Sanborn, Brandon & Duvall, P.O. Box 97, Dublin, Ohio. 43017. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Petroleum and petroleum products*, (except in bulk), from the facilities of Industrial Terminal Systems, Inc., at or near Logans Ferry, Plum Borough, Allegheny County, Pa., to points in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee and Texas, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): Quaker State Oil Refining Corp., P.O. Box 989, Oil City, Pa. 16301. Send protests to: Frank L. Calvary, District Supervisor, Interstate Commerce Commission, 220 Federal Bldg. and U.S. Courthouse, 85 Marconi Boulevard, Columbus, Ohio 43215.

No. MC 143371TA, filed June 13, 1977. Applicant: JOHN M. PARSONS, South Green Street, Tuckerton, N.J. 08087. Applicant's representative: Robert B. Pepper, 168 Woodbridge Avenue, Highland Park, N.J. 08904. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Fresh and frozen meats, meat by-products, frozen foods, and dairy products*, from Philadelphia, Pa., to points in Atlantic, Burlington, Cape May, Monmouth, and Ocean Counties, N.J., restricted to shipments picked up and delivered the same day for 180 days. Ap-

plicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): (1) Milden and White, Inc., 1224 North 9th Street, Philadelphia, Pa. 19122. (2) Stein-Henry Company, 1705 North America Street, Philadelphia, Pa. 19122. (3) E. F. Schulze Co. 414 N. Percy Street, Philadelphia, Pa. 19123. Send protests to: Dieter H. Harper, District Supervisor, Interstate Commerce Commission, 428 East State Street, Room 204, Trenton, N.J. 08608.

No. MC 143372 TA, filed June 13, 1977. Applicant: PEOPLES TRANSFER, INC., 1712 S. Bunn Street, Bloomington, Ill. 61701. Applicant's representative: Donald S. Mullins, 4704 W. Irving Park Road, Chicago, Ill. 60641. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Carpeting, carpet padding, vinyl flooring and flooring products*, between the facilities of Carpetland U.S.A., at or near Munster, Ind., on the one hand, and, on the other, points and places in the Commercial Zones of Bloomington, Champaign, Decatur, Elk Grove Village, Joliet, Peoria and Springfield, Ill., for 180 days. Supporting shipper(s): Carpetland U.S.A. David Brownlee, Service Manager, 8201 Calumet Avenue, Munster, Ind. 46321. Send protests to: Patricia A. Roscoe District Supervisor, Interstate Commerce Commission, Everett McKinley Dirksen Building, 219 S. Dearborn Street, Room 1386, Chicago, Ill. 60604.

PASSENGER APPLICATION

No. MC 141063 (Sub-No. 2TA), filed June 9, 1977. Applicant: THE CITY CONTRACT BUS SERVICE, INC., P.O. Box 2182, Jacksonville, Fla. 32203. Applicant's representative: Archie B. Culbreth, 1252 West Peachtree St., N.W., Suite 246, Atlanta, Ga. 30309. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Passengers* who are employees of Louisville and Nashville Railroad Company, and their baggage, between points in Georgia on and north of Interstate 20, on the one hand, and, on the other, points in Tennessee along the line of Louisville and Nashville Railroad Company, under a continuing contract, or contracts, with Louisville and Nashville Railroad Company, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper(s): Louisville and Nashville Railroad Company, 1590 Marietta Blvd., N.W. Atlanta, Ga. 30301. Send protests to: G. H. Fauss, Jr. District Supervisor, Bureau of Operations, Interstate Commerce Commission, Box 35008, 400 West Bay Street, Jacksonville, Fla. 32202.

By the Commission.

H. G. HOMME, Jr.,
Acting Secretary.

[FR Doc. 77-18521 Filed 6-27-77; 8:45 am]

sunshine act meetings

This section of the FEDERAL REGISTER contains notices of meetings published under the "Government in the Sunshine Act" (Pub. L. 94-409), 5 U.S.C. 552b(e)(3).

CONTENTS

	Item	
Civil Aeronautics Board.....	1, 2, 3	Board's Policies Concerning Deliberate Overbooking and Oversales. ¹
Civil Service Commission.....	11	At the June 23, 1977 Board meeting, Chairman Kahn noted that one of the Office of General Counsel attorneys who is involved in the Overbooking proceeding would not be available for the June 28, 1977 Board meeting and that the item would be rescheduled in the near future.
Federal Deposit Insurance Corporation.....	4	The following Members voted that agency business that this item be deleted from the June 28, 1977, agenda and that no earlier announcement of the change was possible:
Federal Election Commission.....	5	Chairman Alfred E. Kahn
Federal Reserve System.....	6	Member G. Joseph Minetti
Foreign Claims Settlement Commission.....	7	Member Lee R. West
International Trade Commission.....	8	
Interstate Commerce Commission.....	9	
Nuclear Regulatory Commission.....	10	

1

AGENCY HOLDING THE MEETING: Civil Aeronautics Board.

[MA-10 amending M-25]

Notice of deletion of item from June 28, 1977 meeting agenda.

REVISED AGENDA

TIME AND DATE: 10 a.m., June 28, 1977.

PLACE: Room 1027, 1825 Connecticut Avenue NW., Washington, D.C. 20428.

SUBJECT: 1. Ratification of Items Adopted by Negotiation.¹

2. Docket 30714, Application of Braniff Airways Inc. for an exemption pursuant to section 416(b) of the Federal Aviation Act of 1958 to provide free transportation for travel agents to attend the TravelAge MidAmerica Sales Seminar, Trade Show and Familiarization Program in Houston, Texas between September 16 and 18, 1977.

3. Docket 30362, Petition of Air Freight Forwarders Association to amend Part 296 to permit the payment of commissions on international consolidated shipments or, in the alternative, the issuance of a Policy Statement by the Board recognizing that freight forwarders may be compensated for delivering freight shipments to the Direct Carriers "ready for carriage."

STATUS: Open.

PERSON TO CONTACT:

Phyllis T. Kaylor, the Secretary, 202-673-5068.

SUPPLEMENTARY INFORMATION: Item 4 on the announced agenda for the June 28, 1977 Board meeting was Docket 29139, EDR-296, "Reexamination of the

¹ The ratification process provides an entry in the Board's Minutes of Items already adopted by the Board through the written Notation process (memoranda circulated to the Members sequentially). A list of items ratified at this meeting will be available in the Board's Public Reference Room (Room 710, 1825 Connecticut Avenue NW., Washington, D.C. 20428) following the meeting.

Chairman Alfred E. Kahn
Member G. Joseph Minetti
Member Lee R. West

PHYLLIS T. KAYLOR,
Secretary.

[S-757-77 Filed 6-24-77;9:01 am]

2

AGENCY HOLDING THE MEETING: Civil Aeronautics Board.

[M-25]

TIME AND DATE: 10 a.m., June 30, 1977.

PLACE: Room 1027, 1825 Connecticut Avenue NW., Washington, D.C. 20428.

SUBJECT: 1. Ratification of Items Adopted by Notation.¹

2. Discussion of regulatory reform legislation currently before Congress.

STATUS: Open.

PERSON TO CONTACT:

Phyllis T. Kaylor, The Secretary, 202-673-5068.

PHYLLIS T. KAYLOR,
Secretary.

[S-758-77 Filed 6-24-77;9:01 am]

3

AGENCY HOLDING THE MEETING: Civil Aeronautics Board.

[M-25]

TIME AND DATE: 10 a.m., June 28, 1977.

PLACE: Room 1027, 1825 Connecticut Avenue NW., Washington, D.C. 20428.

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SUBJECT: 1. Ratification of Items Adopted by Notation.¹

2. Docket 30714, Application of Braniff Airways Inc. for an exemption pursuant to section 416(b) of the Federal Aviation Act of 1958 to provide free transportation for travel agents to attend the TravelAge MidAmerica Sales Seminar, Trade Show and Familiarization Program in Houston, Texas between September 16 and 18, 1977.

3. Docket 30362, Petition of Air Freight Forwarders Association to amend Part 296 to permit the payment of commissions on international consolidated shipments or, in the alternative, the issuance of a Policy Statement by the Board recognizing that freight forwarders may be compensated for delivering freight shipments to the Direct Carriers "ready for carriage."

4. Docket 29139, EDR-296 Reexamination of the Board's Policies Concerning Deliberate Overbooking and Oversales.

STATUS: Open.

PERSON TO CONTACT:

Phyllis T. Kaylor, the Secretary, 202-673-5068.

PHYLLIS T. KAYLOR,
Secretary.

[S-759-77 Filed 6-24-77;9:01 am]

4

AGENCY HOLDING THE MEETING: Federal Deposit Insurance Corporation.

"FEDERAL REGISTER" CITATION OF PREVIOUS ANNOUNCEMENT: 42 FR 31518.

PREVIOUSLY ANNOUNCED TIME AND DATE OF THE MEETING: 11 a.m., June 27, 1977.

CHANGES IN THE MEETING:

Notice is hereby given of the addition of a Resolution regarding a one month extension of time within which certain employees may file a Statement of Employment and Financial Interests and a Resolution to establish an Office of Personnel Management to the agenda for consideration at its open meeting

¹ The ratification process provides an entry in the Board's Minutes of Items already adopted by the Board through the written Notation process (memoranda circulated to the Members sequentially). A list of items ratified at this meeting will be available in the Board's Public Reference Room (Room 710, 1825 Connecticut Avenue NW., Washington, D.C. 20428) following the meeting.

scheduled for 11 a.m. at the above time and date.

CONTACT PERSON FOR MORE INFORMATION:

Alan R. Miller, Executive Secretary,
202-389-4446.

[S-780-77 Filed 6-24-77; 9:26 am]

5

AGENCY HOLDING THE MEETING:
Federal Election Commission.

"FEDERAL REGISTER" CITATION OF PREVIOUS ANNOUNCEMENT: S-734-77, 42 FR 32348, June 24, 1977.

PREVIOUSLY ANNOUNCED DATE AND TIME: Thursday, June 30, 1977, 10 a.m.

PLACE: 1325 K Street NW., Washington, D.C.

CHANGE IN THE MEETING:

Please Add Advisory Opinion 1977-16.

PERSON TO CONTACT FOR INFORMATION:

David Flske, Press Officer, telephone:
302-523-4065.

[S-761-77 Filed 6-24-77; 9:58 am]

6

AGENCY HOLDING THE MEETING:
Federal Reserve System; Board of Governors.

TIME AND DATE: 10 a.m., Friday, July 1, 1977.

PLACE: 20th Street and Constitution Avenue NW., Washington, D.C. 20551.

STATUS: Open.

MATTERS TO BE CONSIDERED:

1. Draft testimony to be presented before the Subcommittee on Consumer Affairs of the Senate Committee on Banking, Housing and Urban Affairs, regarding bills to simplify the Truth in Lending Act.

2. Any agenda items carried forward from a previously announced meeting.

CONTACT PERSON FOR MORE INFORMATION:

Mr. Joseph R. Coyne, Assistant to the Board, 202-452-3204.

Dated: June 24, 1977.

Griffith L. Garwood,
Deputy Secretary of the Board.

[S-762-77 Filed 6-24-77; 11:09 am]

7

AGENCY HOLDING THE MEETING:
Foreign Claims Settlement Commission.

[Notice No. 9-77]

ANNOUNCEMENT IN REGARD TO COMMISSION MEETINGS AND HEARINGS

The Foreign Claims Settlement Commission, pursuant to its regulations (45 CFR Part 504), and the Government in the Sunshine Act (5 U.S.C. 552b), hereby gives notice in regard to the scheduling of open meetings and oral hearings for the transaction of routine Commission business and other matters specified, as follows:

Date, Time, and Subject Matter

Wednesday, July 6, 1977, at 10:30 a.m.,
Routine Business.

Wednesday, July 13, 1977, at 10:30 a.m.,
Routine Business.

Wednesday, July 20, 1977, at 10:30 a.m.,
Routine Business.

Wednesday, July 27, 1977, at 10:30 a.m.,
Routine Business.

Subject matter listed above, not disposed of at the scheduled meeting, may be carried over to the agenda of the following meeting.

All meetings are held at the Foreign Claims Settlement Commission, 1111 20th Street NW., Washington, D.C. Requests for information, or advance notices of intention to observe a meeting, may be directed to: Executive Director, Foreign Claims Settlement Commission, 1111 20th Street NW., Washington, D.C. 20579. Telephone: 202-653-6156.

Dated at Washington, D.C., on June 22, 1977.

Francis T. Masterson,
Executive Director.

[S-753-77 Filed 6-23-77; 3:35 pm]

8

AGENCY HOLDING THE MEETING:
United States International Trade Commission.

"FEDERAL REGISTER" CITATION OF PREVIOUS ANNOUNCEMENT: 42 FR 30574.

PREVIOUSLY ANNOUNCED TIME AND DATE OF THE MEETING: 9:30 a.m., June 23, 1977.

CHANGES IN THE MEETING:

Agenda item No. 2 (Press reports on predatory pricing in steel), previously announced as being open to the public, was closed to the public by vote of a majority

of the entire membership of the Commission.

CONTACT PERSON FOR MORE INFORMATION:

Kenneth R. Mason, Secretary, 202-523-0161.

[S-752-77 Filed 6-23-77; 3:35 p.m.]

9

AGENCY HOLDING THE MEETING:
Interstate Commerce Commission.

"FEDERAL REGISTER" CITATION OF PREVIOUS ANNOUNCEMENT: Published June 27, 1977.

TIME AND DATE: Changed time from 9:30 a.m. to 9 a.m., Tuesday, June 28, 1977.

PLACE: Commission's Offices, 12th and Constitution Avenue NW., Washington, D.C.

STATUS: *Closed Special Conference.* Voting to close as to the following item on the agenda were Chairman O'Neal, Commissioners Clapp, Murphy, Stafford, Gresham, MacFarland and Christian (Commissioners Brown and Hardin did not participate) on the grounds that such meeting is likely to specifically concern the initiation and conduct by the Commission of a particular case of formal adjudication involving a determination on the record after opportunity for a hearing, within the meaning of 5 U.S.C. 552b(c)(10) and 49 CFR 1012.7(d)(12). The General Counsel has issued his certificate accordingly.

No. 36611, Trans Alaska Pipeline System—Tariff Consideration

In addition to the Commission, the following will be in attendance: Mark L. Evans, General Counsel; Janice M. Rosenak, Deputy Director, Section of Rates, Office of Proceedings; John A. Grady, Director, Bureau of Accounts; and William Bono, Thomas Carpenter, Joseph Morgan, David Drucker and Edward Johnson, all of the Bureau of Accounts.

CONTACT PERSON FOR MORE INFORMATION:

Public Information Officer, Douglas Baldwin, telephone 202-275-7252.

[S-756-77 Filed 6-24-77; 9:01 am]

10

AGENCY HOLDING THE MEETING:
Nuclear Regulatory Commission.

TIME AND DATE: Wednesday, June 22, and Friday, June 24, 1977.

SUNSHINE ACT MEETINGS

PLACE: Commissioners' Conference Room, 1717 H St. NW., Washington, D.C.

STATUS: Closed.

MATTERS TO BE CONSIDERED:

Wednesday, June 22, 4:30 p.m. (approx): Discussion of Awards (Exemptions 2 and 6).

Friday, June 24, 4:30 p.m.: 1 Discussion of Tarapur Export License (Exemptions 1 and 10) (Approx. 1 hr). 2. Vote to Extend Review of Indian Point ALAB Decision (Exemption 10) (Approx. 10 min.). 3. Order on Seabrook (Exemption 10) (Approx. 5 min.).

CONTACT PERSON FOR MORE INFORMATION:

Walter Magee, 202-634-1410.

Dated: June 22, 1977.

WALTER MAGEE,
Office of the Secretary.

[S-754-77 Filed 6-23-77;3:39 pm]

11

AGENCY HOLDING MEETING: Civil Service Commission.

TIME AND DATE OF MEETING: 9 a.m., July 5, 1977.

PLACE: Commissioners' Meeting Room, Room 5H09 (fifth floor), 1900 E Street NW., Washington, D.C.

STATUS: Open.

MATTERS TO BE CONSIDERED:

(1) Continuation of discussion of Recommendations of the Task Force on Merit Staffing Review Recommendations.

(2) Approval of a Graduate Level Work Experience Program.

CONTACT PERSON FOR MORE INFORMATION:

Georgia Metropulos, Office of the Executive Assistant to the Commissioners, 202-632-5556.

UNITED STATES CIVIL SERVICE COMMISSION,
JAMES C. SPRY,
Executive Assistant
to the Commissioners.

[S-768-77 Filed 6-27-77;9:43 am]

**Register
Federal**

TUESDAY, JUNE 28, 1977

PART II



**FEDERAL
ELECTION
COMMISSION**

■

**ADVISORY OPINION
REQUESTS**

**FEDERAL ELECTION
COMMISSION**

[Notice 1977-35, AOR 1977-27]

ADVISORY OPINION REQUEST

Pursuant to 2 U.S.C. 437f(c) and the procedures reflected in Part 112 of the Commission's regulations, published on August 25, 1976 (41 FR 35954), Advisory Opinion Request 1977-27 has been made public at the Commission. Copies of AOR 1977-27 were made available on June 21, 1977. These copies of the advisory opinion request were made available for public inspection and purchase at the Federal Election Commission, Public Records Division, at 1325 K Street NW., Washington, D.C. 20463.

Interested persons may submit written comments on any advisory opinion request within ten days after the date the request was made public at the Commission. These comments should be directed to the Office of General Counsel, Advisory Opinion Section at the Commission. Persons requiring additional time in which to respond to any advisory opinion requests will normally be granted such time upon written request to the Commission. All timely comments received by the Commission will be considered before the Commission issues an advisory opinion. Comments on pending requests should refer to the specific AOR number of the requests and statutory references should be to the United States Code citations rather than to the Public Law citations.

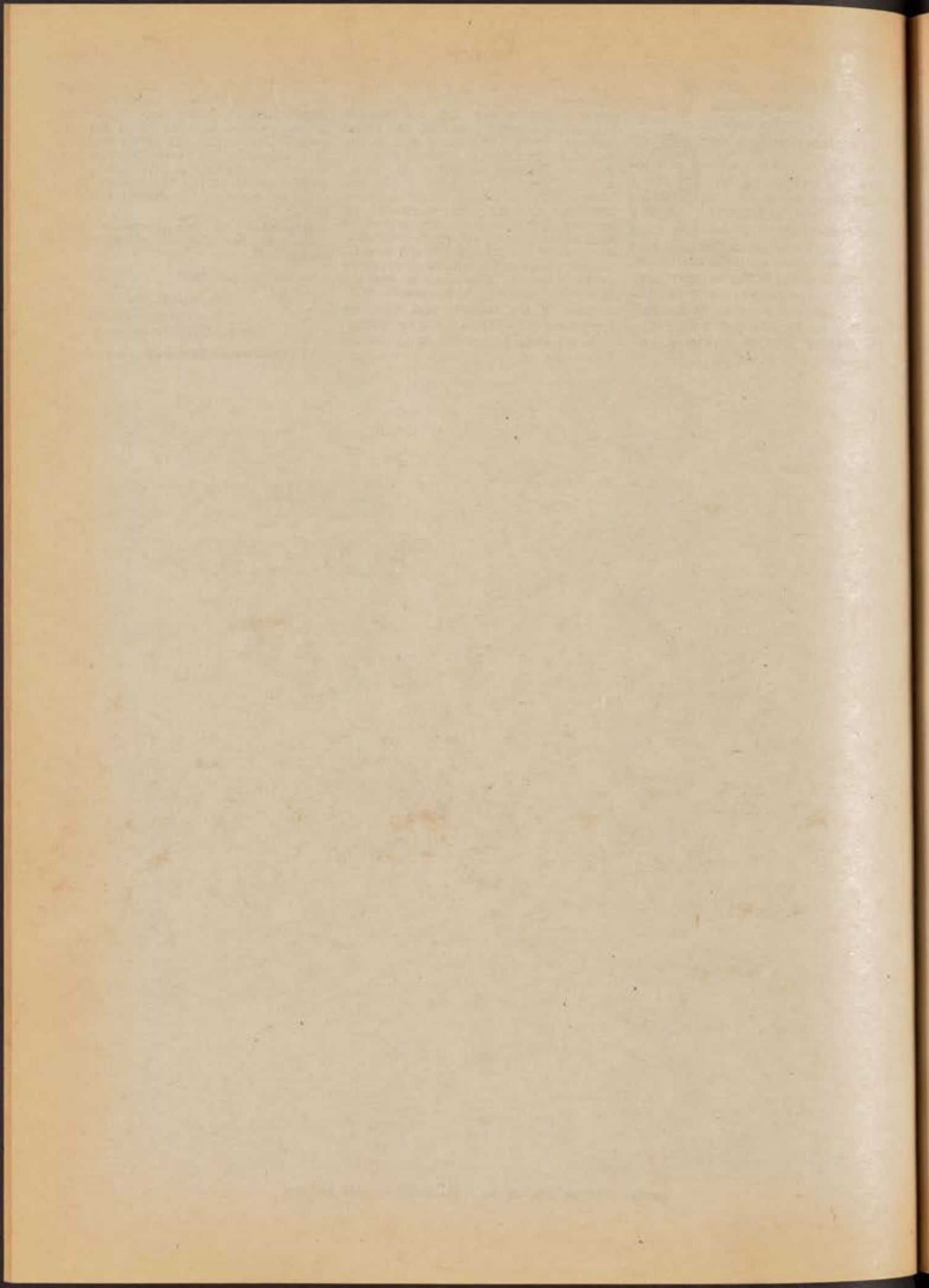
AOR 1977-27: Is the Intern Program Trust Fund of Florida's Tenth Congressional District, which was established to receive and disburse funds for the purpose of sending high school students to Washington "to observe various operations of the federal government," an office account of the Member of Congress representing the district under 2 U.S.C. 439a.

Requested by Representative L.A. Bafalis, House of Representatives, Washington, D.C.

Dated: June 20, 1977.

THOMAS E. HARRIS,
*Chairman for the
Federal Election Commission.*

[FR Doc. 77-18126 Filed 6-27-77; 8:45 am]



Register
for
Federal

TUESDAY, JUNE 28, 1977

PART III



**ENVIRONMENTAL
PROTECTION
AGENCY**

■

**CONTROL OF AIR
POLLUTION FROM NEW
MOTOR VEHICLES AND
NEW MOTOR VEHICLE
ENGINES**

**Republication of the 1977, 1978, and
1979 Model Year Motor Vehicle
Certification Regulations**

Title 40—Protection of Environment

[FRL 748-6]

CHAPTER I—ENVIRONMENTAL PROTECTION AGENCY

PART 86—CONTROL OF AIR POLLUTION FROM NEW MOTOR VEHICLES AND NEW MOTOR VEHICLE ENGINES

Republication of the 1977, 1978, and 1979 Model Year Motor Vehicle Certification Regulations

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: This action is a republication of the 1977 model year motor vehicle certification regulations, a publication of the complete 1978 model year motor vehicle certification regulations, and a publication of the existing 1979 model year motor vehicle certification regulations. This publication is being issued to provide the public with complete, updated 1977, 1978, and 1979 model year motor vehicle certification regulations to aid in the use of those regulations. This action is needed due to the numerous amendments that have been made to the regulations since they were last published in their complete form (July 1, 1976 edition of the Code of Federal Regulations, Title 40, Parts 60 to 99). This document does not make any changes to the existing motor vehicle certification requirements.

EFFECTIVE DATE: These amendments are effective June 28, 1977.

FOR FURTHER INFORMATION CONTACT:

David A. Finley, Regulatory Management Staff, Mobile Source Air Pollution Control (AW-455), Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460, (202) 755-0596.

SUPPLEMENTARY INFORMATION: The Agency finds good cause to omit as unnecessary a notice of proposed rule-making and public rulemaking procedure in the issuance of these regulations. These regulations are a recodification of existing regulatory requirements, applicable to 1977, 1978 and 1979 model year certification. For the same reasons, the Agency finds good cause to make these regulations effective on the date of publication in the FEDERAL REGISTER.

NOTE:—The Environmental Protection Agency has determined that this document does not contain a major regulation requiring preparation of an Economic Impact Statement under Executive Order 11821, as amended by Executive Order 11949, and under OMB Circular A-107.

Dated: June 14, 1977.

EDWARD F. TUERK,
Acting Assistant Administrator
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40 CFR Part 86 is amended by revising Subpart A, Subpart B, and Appendices I through VI, to read as follows:

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Authority: Secs. 202, 206, 207, 208, 301(a) of the Clean Air Act, as amended (42 U.S.C. 1857f-1, 1857f-5, 1857f-5a, 1857f-6, 1857g(a)).

Subpart A—General Provisions for Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles, 1977 and Later Model Year New Light-Duty Trucks, and for 1977 and Later Model Year New Heavy-Duty Engines

§ 86.077-1 General applicability.

The provisions of this subpart are applicable to 1977 and later model year new gasoline-fueled and Diesel light-duty vehicles, 1977 and later model year new gasoline-fueled and Diesel light-duty trucks and 1977 and later model year new gasoline-fueled and Diesel heavy-duty engines.

§ 86.077-2 Definitions.

(a) The definitions in this section apply to this subpart and also to Subparts B, H, I, and J.

(b) As used in this subpart all terms not defined herein shall have the meaning given them in the Act:

"Act" means Part A of title II of the Clean Air Act, 42 U.S.C. 1857 f-1 through f-7, as amended by Pub. L. 91-604.

"Administrator" means the Administrator of the Environmental Protection Agency or his authorized representative.

"Auxiliary Emission Control Device (AECDD)" means any element of design which senses temperature, vehicle speed, engine RPM, transmission gear, manifold vacuum, or any other parameter for the

purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system.

"Calibrating gas" means a gas of known concentration which is used to establish the response curve of an analyzer.

"Configuration" means a subclassification of an engine-system combination on the basis of engine code, inertia weight class, transmission type and gear ratios, rear axle ratio, and other parameters which may be designated by the Administrator.

"Crankcase emissions" means airborne substances emitted to the atmosphere from any portion of the engine crankcase ventilation or lubrication systems.

"Defeat Device" means an AECDD that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal urban vehicle operation and use, unless (1) such conditions are substantially included in the Federal emission test procedure, or (2) the need for the AECDD is justified in terms of protecting the vehicle against damage or accident, or (3) the AECDD does not go beyond the requirements of engine starting.

"Diurnal breathing loss" means fuel evaporative emissions as a result of the daily range in temperature to which the fuel system is exposed.

"Engine family" means the basic classification unit of a manufacturer's product line used for the purpose of test fleet selection and determined in accordance with § 86.077-24.

"Engine-system combination" means an engine family-exhaust emission control system-fuel evaporative emission control system (where applicable) combination.

"EPA Enforcement Officer" means any officer or employee of the Environmental Protection Agency so designated in writing by the Administrator (or by his designee).

"Exhaust emissions" means substances emitted to the atmosphere from any opening downstream from the exhaust port of a motor vehicle engine.

"Fuel evaporative emissions" means vaporized fuel emitted into the atmosphere from the fuel system of a motor vehicle.

"Fuel system" means the combination of fuel tank, fuel pump, fuel lines, and carburetor, or fuel injection components, and includes all fuel system vents and fuel evaporative emission control systems.

"Gross vehicle weight" means the manufacturer's gross weight rating for the individual vehicle.

"Heavy-duty vehicle" means any motor vehicle either designed primarily for transportation of property and rated at more than 6,000 pounds GVW or designed primarily for transportation of persons and having a capacity of more than 12 persons.

"Heavy-duty engine" means any engine which the engine manufacturer could reasonably expect to be used for motive power in a heavy duty vehicle.

"High-altitude" means any elevation over 1219 meters (4000 feet).

"High-altitude conditions" means a test altitude of 1585 meters (5200 feet), plus or minus 274 meters (900 feet), or equivalent observed barometric test conditions of 83.48 kPa (24.72 inches Hg), plus or minus 2.77 kPa (0.82 inches Hg): *Provided*, That the Administrator may approve conditions other than those specified herein on the basis of a written application by the manufacturer.

"Hot soak loss" means fuel evaporative emissions during the 1-hour hot soak period which begins immediately after the engine is turned off.

"Intermediate speed" means the peak torque speed or 60 percent of rated speed, whichever is higher.

"Light-duty truck" means any motor vehicle rated at 6,000 pounds GVW or less, which is designed primarily for purposes of transportation of property or is a derivative of such a vehicle, or is available with special features enabling off-street or off-highway operation and use.

"Light-duty vehicle" means a passenger car or passenger car derivative capable of seating 12 passengers or less.

"Loaded vehicle weight" means the vehicle curb weight of a light-duty vehicle or light-duty truck plus 300 pounds.

"Maximum rated horsepower" means the maximum brake horsepower output of an engine as stated by the manufacturer in his sales and service literature and his application for certification under § 86.077-21.

"Maximum rated torque" means the maximum torque produced by an engine as stated by the manufacturer in his sales and service literature and his application for certification under § 86.077-21.

"Military engine" means any engine manufactured solely for the Department of Defense to meet military specifications.

"Model year" means the manufacturer's annual production period (as determined by the Administrator) which includes January 1 of such calendar year: *Provided*, That if the manufacturer has no annual production period, the term "model year" shall mean the calendar year.

"Nominal fuel tank capacity" means the volume of the fuel tank, specified by the manufacturer to the nearest tenth of a U.S. gallon, which may be filled with fuel from the fuel tank filler inlet.

"Opacity" means the fraction of a beam of light, expressed in percent, which fails to penetrate a plume of smoke.

"Oxides of nitrogen" means the sum of the nitric oxide and nitrogen dioxide contained in a gas sample as if the nitric oxide were in the form of nitrogen dioxide.

"Peak torque speed" means the speed at which an engine develops maximum torque.

"Percent load" means the fraction of the maximum available torque at a specified engine speed.

"Rated speed" means the speed at which the manufacturer specifies the maximum rated horsepower of an engine.

"Running loss" means fuel evaporative emissions resulting from an average trip

in an urban area or the simulation of such a trip.

"Scheduled maintenance" means any adjustment, repair, removal, disassembly, cleaning, or replacement of vehicle components or systems which is performed on a periodic basis to prevent part failure or vehicle (if the engine were installed in a vehicle) malfunction.

"Smoke" means the matter in the exhaust emissions which obscures the transmission of light.

"Span gas" means a gas of known concentration which is used routinely to set the output level of an analyzer.

"System" includes any motor vehicle engine modification which controls or causes the reduction of substances emitted from motor vehicles.

"Tank fuel volume" means the volume of fuel in the fuel tank(s), which is determined by multiplying the manufacturer's nominal tank(s) capacity by 0.40, the result being rounded using ASTM E29-87 to the nearest tenth of a U.S. gallon.

"Throttle" means the mechanical linkage which either directly or indirectly controls the fuel flow to the engine.

"Unscheduled maintenance" means any adjustment, repair, removal, disassembly, cleaning, or replacement of vehicle components or systems which is performed to correct a part failure or vehicle (if the engine were installed in a vehicle) malfunction.

"Useful life" means:

(1) For light-duty vehicles and light-duty trucks a period of use of 5 years or 50,000 miles, whichever first occurs.

(2) For gasoline-fueled heavy-duty engines a period of use of 5 years or 50,000 miles of vehicle operation or 1,500 hours of engine operation (or an equivalent period of 1,500 hours of dynamometer operation), whichever first occurs.

(3) For Diesel heavy-duty engines a period of use of 5 years or 100,000 miles of vehicle operation or 3,000 hours of engine operation (or an equivalent period of 1,000 hours of dynamometer operation), whichever first occurs.

"Vehicle curb weight" means the actual or the manufacturer's estimated weight of the vehicle in operational status with all standard equipment, and weight of fuel at nominal tank capacity, and the weight of optional equipment computed in accordance with § 86.077-24.

"Zero (0) hours" means that point after normal assembly line operations and adjustments are completed and before one (1) additional operating hour has been accumulated.

"Zero (0) miles" means that point after initial engine starting (not to exceed 10 miles of vehicle operation, or one hour of engine operation) at which normal assembly line operations and adjustments are completed.

§ 86.077-3 Abbreviations.

(a) The abbreviations in this section apply to this subpart and also to Subparts B, H, I, and J and have the following meanings:

accel.—acceleration.

AECD—Auxiliary emission control device.

API—American Petroleum Institute.
ASTM—American Society for Testing and Materials.

BHP—Brake horsepower.

BSCO—Brake specific carbon monoxide.

BSHC—Brake specific hydrocarbons.

BSNO_x—Brake specific oxides of nitrogen.

C—Celsius.

cfm—cubic feet per hour.

CFV—Critical flow venturi.

CFV-CVS—Critical flow venturi—constant volume sampler.

CL—Chemiluminescence.

CO₂—carbon dioxide.

CO—carbon monoxide.

conc.—concentration.

cfm—cubic feet per minute.

CT—Closed throttle.

cu. in.—cubic inch(es).

CVS—Constant volume sampler.

decel.—deceleration.

EP—End point.

evap.—evaporative.

F—Fahrenheit.

FID—Flame ionization detector.

FL—Full load.

ft.—feet.

g.—gram(s).

gal.—U.S. gallon(s).

GVW—Gross vehicle weight.

GVWR—Gross vehicle weight rating.

h—hour(s).

H₂O—water.

HC—hydrocarbon(s).

HFID—Heated flame ionization detector.

Hg—mercury.

hi—high.

hp.—horsepower.

IBP—Initial boiling point.

ID—Internal diameter.

in.—inch(es).

K—kelvin.

kg.—kilogram(s).

km.—kilometer(s).

kPa—kilopascal(s).

lb.—pound(s).

lb.-ft.—pound-feet.

m.—meter(s).

max.—maximum.

mg.—milligram(s).

mi.—mile(s).

min.—minute(s).

ml.—milliliter(s).

mm.—millimeter(s).

mph—miles per hour.

mV—millivolt(s).

N₂—nitrogen.

NDIR—Nondispersive infrared.

NO—nitric oxide.

NO₂—nitrogen dioxide.

NO_x—oxides of nitrogen.

No.—Number.

O₂—oxygen.

Pb—lead.

pct.—percent.

PDP-CVS—Positive displacement pump—constant volume sampler.

ppm—parts per million by volume.

ppm C—parts per million, carbon.

psf—pounds per square inch.

psig—pounds per square inch gauge.

PTA—Part throttle acceleration.

PTD—Part throttle deceleration.

R—Rankin.

rpm—revolutions per minute.

RVP—Reid vapor pressure.

s.—second(s).

SAE—Society of Automotive Engineers.

SI—International system of units.

sp.—speed.

TEL—Tetraethyl lead.

TML—Tetramethyl lead.

UDDS—Urban dynamometer driving schedule.

V—volt(s).

vs.—versus.

W—watt(s).

WF—Weighting factor.

WOT—Wide open throttle.

wt.—weight.

'—feet.

"—inch(es).

*—degree(s).

Σ—summation.

§ 86.077-4 Section numbering; construction.

(a) *Section numbering.* The model year of initial applicability is indicated by the last two digits of the 5 digit group. A section remains in effect for subsequent model years until it is superseded. The number following the hyphen designates what previous section is replaced by a future regulation.

EXAMPLES: Section 86.077-6 applies to the 1977 and subsequent model years until superseded. If a § 86.080-6 is promulgated it would take effect with the 1980 model year; § 86.077-6 would not apply after the 1979 model year. Section 86.077-10 would be replaced by § 86.078-10 beginning with the 1978 model year.

(b) *Construction.* Except where indicated, the language in this subpart applies to both vehicles and engines. In many instances language referring to engines is enclosed in parentheses and immediately follows the language discussing vehicles.

§ 86.077-5 General standards; increase in emissions; unsafe conditions.

(a) (1) Every new motor vehicle (or new motor vehicle engine) manufactured for sale, sold, offered for sale, introduced, or delivered for introduction into commerce, or imported into the United States for sale or resale which is subject to any of the standards prescribed in this subpart shall be covered by a certificate of conformity issued pursuant to §§ 86.077-21 through 86.077-23 and §§ 86.077-29 through 86.077-34.

(2) No heavy-duty vehicle manufacturer shall take any of the actions specified in section 203(a) (1) of the Act with respect to any gasoline-fueled or Diesel heavy-duty vehicle which uses an engine which has not been certified as meeting applicable standards. Each heavy-duty vehicle manufacturer shall provide to the Administrator prior to the beginning of each model year a statement signed by an authorized representative which includes the following information:

(i) A description of the vehicles which will be produced subject to this section;

(ii) Identification of the engines used in the vehicles;

(iii) Projected sales data on each vehicle-engine combination;

(iv) A statement that the engines will not be modified by the vehicle manufacturer or a detailed specification of any changes which will be made. Changes made solely for the purpose of mounting an engine in a vehicle need not be included.

(v) A statement that the engine maintenance instruction supplied by the engine manufacturer, in compliance with § 86.077-38, will be furnished to the ultimate purchaser. If these maintenance instructions are modified, a detailed description of the modifications and a justification for each must be provided to the

Administrator for review. The Administrator will notify the manufacturer of the determination whether the modified instructions are reasonable and necessary to assure proper functioning of the emission control system.

(b) (1) Any system installed on or incorporated in a new motor vehicle (or new motor vehicle engine) to enable such vehicle (or engine) to conform to standards imposed by this subpart:

(i) Shall not in its operation or function cause the emission into the ambient air of any noxious or toxic substance that would not be emitted in the operation of such vehicle (or engine) without such system, except as specifically permitted by regulation; and

(ii) Shall not in its operation, function, or malfunction result in any unsafe condition endangering the motor vehicle, its occupants, or persons or property in close proximity to the vehicle.

(2) Every manufacturer of new motor vehicles (or new motor vehicle engines) subject to any of the standards imposed by this subpart shall, prior to taking any of the actions specified in section 203(a) (1) of the Act, test or cause to be tested motor vehicles (or motor vehicle engines) in accordance with good engineering practice to ascertain that such test vehicles (or test engines) will meet the requirements of this section for the useful life of the vehicle (or engine).

§ 86.077-6 Hearings on certification.

(a) (1) After granting a request for a hearing under §§ 86.077-22 or 86.077-30 the Administrator will designate a Presiding Officer for the hearing.

(2) The General Counsel will represent the Environmental Protection Agency in any hearing under this section.

(3) If a time and place for the hearing has not been fixed by the Administrator under §§ 86.077-22 or 86.077-30, the hearing shall be held as soon as practicable at a time and place fixed by the Administrator or by the Presiding Officer.

(4) In the case of any hearing requested pursuant to § 86.077-30(c) (5) (1), the Administrator may in his discretion direct that all argument and presentation of evidence be concluded within such fixed period not less than 30 days as he may establish from the date that the first written offer of a hearing is made to the manufacturer. To expedite proceedings, the Administrator may direct that the decision of the Presiding Officer (who may, but need not be the Administrator himself) shall be the final EPA decision.

(b) (1) Upon his appointment pursuant to paragraph (a) of this section, the Presiding Officer will establish a hearing file. The file shall consist of the notice issued by the Administrator under §§ 86.077-22 or 86.077-30 together with any accompanying material, the request for a hearing and the supporting data submitted therewith, and all documents relating to the request for certification and all documents submitted therewith, and correspondence and other data material to the hearing.

(2) The hearing file will be available for inspection by the applicant at the office of the Presiding Officer.

(c) An applicant may appear in person, or may be represented by counsel or by any other duly authorized representative.

(d) (1) The Presiding Officer upon the request of any party, or in his discretion, may arrange for a prehearing conference at a time and place specified by him to consider the following:

(i) Simplification of the issues;

(ii) Stipulations, admissions of fact, and the introduction of documents;

(iii) Limitation of the number of expert witnesses;

(iv) Possibility of agreement disposing of all or any of the issues in dispute;

(v) Such other matters as may aid in the disposition of the hearing, including such additional tests as may be agreed upon by the parties.

(2) The results of the conference shall be reduced to writing by the Presiding Officer and made part of the record.

(e) (1) Hearings shall be conducted by the Presiding Officer in an informal but orderly and expeditious manner. The parties may offer oral or written evidence, subject to the exclusion by the Presiding Officer of irrelevant, immaterial and repetitious evidence.

(2) Witnesses will not be required to testify under oath. However, the Presiding Officer shall call to the attention of witnesses that their statements may be subject to the provisions of title 18 U.S.C. 1001 which imposes penalties for knowingly making false statements or representations, or using false documents in any matter within the jurisdiction of any department or agency of the United States.

(3) Any witness may be examined or cross-examined by the Presiding Officer, the parties, or their representatives.

(4) Hearings shall be reported verbatim. Copies of transcripts of proceedings may be purchased by the applicant from the reporter.

(5) All written statements, charts, tabulations, and similar data offered in evidence at the hearing shall, upon a showing satisfactory to the Presiding Officer of their authenticity, relevancy, and materiality, be received in evidence and shall constitute a part of the record.

(6) Oral argument may be permitted in the discretion of the Presiding Officer and shall be reported as part of the record unless otherwise ordered by him.

(f) (1) The Presiding Officer shall make an initial decision which shall include written findings and conclusions and the reasons or basis therefor on all the material issues of fact, law, or discretion presented on the record. The findings, conclusions, and written decision shall be provided to the parties and made a part of the record. The initial decision shall become the decision of the Administrator without further proceedings unless there is an appeal to the Administrator or motion for review by the Administrator within 20 days of the date the initial decision was filed.

(2) On appeal from or review of the initial decision the Administrator shall have all the powers which he would have in making the initial decision including the discretion to require or allow briefs, oral argument, the taking of additional evidence or the remanding to the Presiding Officer for additional proceedings. The decision by the Administrator shall include written findings and conclusions and the reasons or basis therefor on all the material issues of fact, law, or discretion presented on the appeal or considered in the review.

§ 86.077-7 Maintenance of records; submittal of information; right of entry.

(a) The manufacturer of any new motor vehicle (or new motor vehicle engine) subject to any of the standards or procedures prescribed in this subpart shall establish, maintain and retain the following adequately organized and indexed records.

(1) *General records.* (i) The records required to be maintained by this paragraph shall consist of:

(A) Identification and description of all certification vehicles (or certification engines) for which testing is required under this subpart.

(B) A description of all emission control systems which are installed on or incorporated in each certification vehicle (or certification engine).

(C) A description of all procedures used to test each such certification vehicle (or certification engine).

(ii) A properly filed application for certification, following the format prescribed by the US EPA for the appropriate model year, fulfills each of the requirements of this paragraph (a) (1).

(2) *Individual records.* (i) A brief history of each motor vehicle (or motor vehicle engine) used for certification under this subpart in the form of a separate booklet or other document for each separate vehicle (or each separate engine) in which shall be recorded:

(A) In the case where a current production engine is modified for use in a certification vehicle (or as a certification engine), a description of the process by which the engine was selected and of the modifications made, giving specifically the place of modification and installation of the engine into the certification vehicle and the person(s) in charge of modification and installation, as applicable. In the case where the engine for a certification vehicle (or certification engine) is not derived from a current production engine, a general description of the build up of the engine (e.g., experimental heads were cast and machined according to supplied drawings, etc.) giving specifically the place of engine assembly and installation into a certification vehicle and the person(s) in charge of engine assembly and installation, as applicable. In both cases above, a description of the origin and selection process for the carburetor, distributor, fuel system components, fuel injection components, emission control system components, smoke exhaust emission control system components, and exhaust

aftertreatment devices as applicable, shall be included. The required descriptions shall specify the steps taken to assure that the certification vehicle (or certification engine) with respect to its engine, drive train, fuel system, emission control system components, exhaust aftertreatment devices, smoke exhaust emission control system components, vehicle weight or any other devices or components as applicable, that can reasonably be expected to influence exhaust or evaporative emissions, as applicable, will be representative of production vehicles (or engines) and that either all components and/or vehicle (or engine) construction processes, component inspection and selection techniques, and assembly techniques employed in constructing such vehicles (or engines) are reasonably likely to be implemented for production vehicles (or engines) or that they are as closely analogous as practicable to planned construction and assembly processes.

(B) A complete record of all emission tests performed under Subparts B, H, I, and J, as applicable (except tests performed by EPA directly), including all individual worksheets and/or other documentation relating to each such test, or exact copies thereof, the date, time, purpose, and location of each test, the number of miles accumulated on the vehicle (or the number of hours accumulated on the engine), when the tests began and ended, and the names of supervisory personnel responsible for the conduct of the tests.

(C) The date and times of each mileage (or service) accumulation run, listing both the mileage (or number of operating hours) accumulated and the name of each driver or each operator of the automatic mileage accumulation device (or dynamometer operator).

(D) If used, the record of any devices employed to record the speed and/or mileage in relationship to time of the test vehicle (or engine RPM, and/or horsepower and/or torque in relationship to engine operating time).

(E) A record and description of all maintenance and other servicing performed, giving the date and time of the maintenance or service, the reason for it, the person authorizing it, and the names of supervisory personnel responsible for the conduct of the maintenance or service. The description shall indicate whether or not EPA specifically consented to the work and, if EPA did not, shall list the provision of this part which authorizes its performance.

(F) A record and description of each test performed to diagnose engine or emissions control system performance, giving the date and time of the tests, the reason for it, the person authorizing it, and the names of supervisory personnel responsible for the conduct of the test.

(G) The dates and times that the vehicle (or engine) was idle in storage, and in transit or transport.

(H) A brief description of any significant events affecting the vehicle (or engine) during any time in the period

covered by the history not described by an entry under one of the previous headings including such extraordinary events as vehicle accidents (or accidents involving the engine) or driver speeding citations or warnings (or dynamometer runaway).

(i) Each such history shall be started on the date that the first of any of the selection or buildup activities in paragraph (a) (2) (1) (A) of this section occurred with respect to the certification vehicle (or engine), shall be updated each time the operational status of the vehicle (or engine) changes or additional work is done on it, and shall be kept in a designated location.

(3) All records required to be maintained under this subpart shall be retained by the manufacturer for a period of six (6) years after issuance of all certificates of conformity to which they relate. Records may be retained as hard copy or reduced to microfilm, punch cards, etc., depending on the record retention procedures of the manufacturer, *Provided*, That in every case all the information contained in the hard copy shall be retained.

(b) The manufacturer of any new motor vehicle (or new motor vehicle engine) subject to any of the standards prescribed in this subpart shall submit to the Administrator at the time of issuance by the manufacturer copies of all instructions or explanations regarding the use, repair, adjustment, maintenance, or testing of such vehicle (or engine) relevant to the control of crankcase, exhaust or evaporative emissions, as applicable, issued by the manufacturer for use by other manufacturers, assembly plants, distributors, dealers, and ultimate purchasers; *Provided*, That any material not translated into the English language need not be submitted unless specifically requested by the Administrator.

(c) (1) Any manufacturer who has applied for certification of a new motor vehicle (or new motor vehicle engine) subject to certification test under this subpart shall admit or cause to be admitted any EPA Enforcement Officer during operating hours on presentation of credentials to any of the following:

(i) Any facility where any such tests or any procedures or activities connected with such tests are or were performed.

(ii) Any facility where any new motor vehicle (or new motor vehicle engine) which is being, was, or is to be tested is present.

(iii) Any facility where any construction process or assembly process used in the modification or build up of such a vehicle (or engine) into a certification vehicle (or certification engine) is taking place or has taken place.

(iv) Any facility where any record or other document relating to any of the above is located.

(2) Upon admission to any facility referred to in paragraph (c) (1) of this section, any EPA Enforcement Officer shall be allowed:

(i) To inspect and monitor any part or aspect of such procedures, activities, and testing facilities, including, but not lim-

ited to, monitoring vehicle (or engine) preconditioning, emissions tests and mileage (or service) accumulation, maintenance, and vehicle soak and storage procedures (or engine storage procedures), and to verify correlation or calibration of test equipment;

(ii) To inspect and make copies of any such records, designs, or other documents; and

(iii) To inspect and/or photograph any part or aspect of any such certification vehicle (or certification engine) and any components to be used in the construction thereof.

(3) In order to allow the Administrator to determine whether or not production motor vehicles (or production motor vehicle engines) conform in all material respects to the design specifications which applied to those vehicles (or engines) described in the application for certification for which a certificate of conformity has been issued to standards prescribed under section 202 of the Act, any manufacturer shall admit any EPA Enforcement Officer on presentation of credentials to both:

(i) Any facility where any document, design, or procedure relating to the translation of the design and construction of engines and emission related components described in the application for certification or used for certification testing into production vehicles (or production engines) is located or carried on; and

(ii) Any facility where any motor vehicles (or motor vehicle engines) to be introduced into commerce are manufactured or assembled.

(4) On admission to any such facility referred to in paragraph (c) (3) of this section, any EPA Enforcement Officer shall be allowed:

(i) To inspect and monitor any aspects of such manufacture or assembly and other procedures;

(ii) To inspect and make copies of any such records, documents or designs; and

(iii) To inspect and photograph any part or aspect of any such new motor vehicles (or new motor vehicle engines) and any component used in the assembly thereof that are reasonably related to the purpose of his entry.

(5) Any EPA Enforcement Officer shall be furnished by those in charge of a facility being inspected with such reasonable assistance as he may request to help him discharge any function listed in this paragraph. Each applicant for or recipient of certification is required to cause those in charge of a facility operated for its benefit to furnish such reasonable assistance without charge to EPA whether or not the applicant controls the facility.

(6) The duty to admit or cause to be admitted any EPA Enforcement Officer applies whether or not the applicant owns or controls the facility in question and applies both to domestic and to foreign manufacturers and facilities. EPA will not attempt to make any inspections which it has been informed that local law forbids. However, if local law makes it impossible to do what is necessary to insure the accuracy of data generated at a facility, no informed judgment that a

vehicle or engine is certifiable or is covered by a certificate can properly be based on those data. It is the responsibility of the manufacturer to locate its testing and manufacturing facilities in jurisdictions where this situation will not arise.

(7) For purposes of this paragraph:

(i) "Presentation of credentials" shall mean display of the document designating a person as an EPA Enforcement Officer.

(ii) Where vehicle, component, or engine storage areas or facilities are concerned, "operating hours" shall mean all times during which personnel other than custodial personnel are at work in the vicinity of the area or facility and have access to it.

(iii) Where facilities or areas other than those covered by paragraph (c) (7) (ii) of this section are concerned, "operating hours" shall mean all times during which an assembly line is in operation or all times during which testing, maintenance, mileage (or service) accumulation, production or compilation of records, or any other procedure or activity related to certification testing, to translation of designs from the test stage to the production stage, or to vehicle (or engine) manufacture or assembly is being carried out in a facility.

(iv) "Reasonable assistance" includes, but is not limited to, clerical, copying, interpretation and translation services, the making available on request of personnel of the facility being inspected during their working hours to inform the EPA Enforcement Officer of how the facility operates and to answer his questions, and the performance on request of emissions tests on any vehicle (or engine) which is being, has been, or will be used for certification testing. Such tests shall be nondestructive, but may require appropriate mileage (or service) accumulation. A manufacturer may be compelled to cause the personal appearance of any employee at such a facility before an EPA Enforcement Officer by written request for his appearance, signed by the Assistant Administrator for Enforcement, served on the manufacturer. Any such employee who has been instructed by the manufacturer to appear will be entitled to be accompanied, represented, and advised by counsel.

(v) Any entry without 24 hour prior written or oral notification to the affected manufacturer shall be authorized in writing by the Assistant Administrator for Enforcement.

§ 86.077-8 Emission standards for 1977 light-duty vehicles.

(a) (1) Exhaust emissions from 1977 model year light duty vehicles shall not exceed:

(i) *Hydrocarbons*, 0.41 grams per vehicle mile.

(ii) *Carbon monoxide*, 3.4 grams per vehicle mile.

(iii) *Oxides of nitrogen*, 2.0 grams per vehicle mile.

(2) For those manufacturers who have been granted a suspension of the standards specified in paragraph (a) (1) the following standards for exhaust

emissions from 1977 model year light-duty vehicles shall apply:

(i) *Hydrocarbons*, 1.5 grams per vehicle mile.

(ii) *Carbon monoxide*, 15 grams per vehicle mile.

(iii) *Oxides of nitrogen*, 2.0 grams per vehicle mile.

(3) The standards set forth in paragraphs (a) (1) and (a) (2) of this section refer to the exhaust emitted over a driving schedule as set forth in Subpart B and measured and calculated in accordance with those procedures.

(b) (1) Fuel evaporative emissions from 1977 model year gasoline-fueled light-duty vehicles shall not exceed:

(i) *Hydrocarbons*, 2.0 grams per test.

(2) The standard set forth in paragraph (a) (1) of this section refers to a composite sample of the fuel evaporative emissions collected under the conditions set forth in Subpart B and measured in accordance with those procedures.

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any 1977 model year gasoline-fueled light-duty vehicle.

§ 86.077-9 Emission standards for 1977 light-duty trucks.

(a) (1) Exhaust emissions from 1977 and later model year light-duty trucks shall not exceed:

(i) *Hydrocarbons*, 2.0 grams per vehicle mile.

(ii) *Carbon monoxide*, 20 grams per vehicle mile.

(iii) *Oxides of nitrogen*, 3.1 grams per vehicle mile.

(2) The standards set forth in paragraph (a) (1) of this section refer to the exhaust emitted over a driving schedule as set forth in Subpart B and measured and calculated in accordance with those procedures.

(b) (1) Fuel evaporative emissions from 1977 model year gasoline-fueled light-duty trucks shall not exceed:

(i) *Hydrocarbons*, 2.0 grams per test.

(2) The standard set forth in paragraph (b) (1) of this section refers to a composite sample of the fuel evaporative emissions collected under the conditions set forth in Subpart B and measured in accordance with those procedures.

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any 1977 model year gasoline-fueled light-duty truck.

§ 86.077-10 Emission standards for 1977 gasoline-fueled heavy-duty engines.

(a) (1) Exhaust emissions from new 1977 and later model year gasoline-fueled heavy-duty engines shall not exceed:

(i) *Hydrocarbons plus oxides of nitrogen (as NO₂)*, 16 grams per brake horsepower hour.

(ii) *Carbon monoxide*, 40 grams per brake horsepower hour.

(2) The standards set forth in paragraph (b) (1) of this section refer to composite samples representing the operating cycle set forth in Subpart H and measured in accordance with those procedures.

(b) [Reserved]

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any new 1977 and later model year gasoline-fueled heavy-duty engine.

(d) Every manufacturer of new motor vehicle engines subject to the standards prescribed in this subpart shall, prior to taking any of the actions specified in section 203(a) (1) of the Act, test or cause to be tested motor vehicle engines in accordance with test procedures prescribed in Subpart H to ascertain that such test engines meet the requirements of paragraphs (a) and (c) of this section.

§ 86.077-11 Emission standards for 1977 Diesel heavy-duty engines.

(a) (1) The opacity of smoke emissions from new 1977 and later model year Diesel heavy-duty engines shall not exceed:

(i) 20 percent during the engine acceleration mode.

(ii) 15 percent during the engine lugging mode.

(iii) 50 percent during the peaks in either mode.

(2) The standards set forth in paragraph (a) (1) of this section refer to exhaust smoke emissions generated under the conditions set forth in Subpart I and measured and calculated in accordance with those procedures.

(b) (1) Exhaust gaseous emissions from new 1977 and later model year Diesel heavy-duty engines shall not exceed:

(i) *Hydrocarbons plus oxides of nitrogen (as NO₂)*, 16 grams per brake horsepower hour.

(ii) *Carbon monoxide*, 40 grams per brake horsepower hour.

(2) The standards set forth in paragraph (b) (1) of this section refer to exhaust gaseous emissions generated under the conditions set forth in Subpart J and measured and calculated in accordance with those procedures.

(c)-(d) [Reserved]

(e) Every manufacturer of new motor vehicle engines subject to the standards prescribed in this subpart shall, prior to taking any of the actions specified in section 203(a) (1) of the Act, test or cause to be tested motor vehicle engines in accordance with test procedures prescribed in Subparts I and J to ascertain that such test engines meet the requirements of paragraphs (a) and (b) of this section.

§ 86.077-12—§ 86.077-20 [Reserved]

§ 86.077-21 Application for certification.

(a) A separate application for a certificate of conformity shall be made for each set of standards and each class of new motor vehicles or new motor vehicle engines. Such application shall be made to the Administrator by the manufacturer and shall be updated and corrected by amendment.

(b) The application shall be in writing, signed by an authorized representative of the manufacturer, and shall include the following:

(1) Identification and description of the vehicles (or engines) covered by the application and a description of their engine (vehicles only), emission control

system, and fuel system components. This shall include a detailed description of each auxiliary emission control device (AECD) to be installed in or on any certification test vehicle (or certification test engine).

(2) Projected U.S. sales data sufficient to enable the Administrator to select a test fleet representative of the vehicles (or engines) for which certification is requested.

(3) A description of the test equipment and fuel proposed to be used.

(4) A description of the proposed mileage (or service) accumulation procedure for durability testing.

(5) A statement of recommended maintenance and procedures necessary to assure that the vehicles (or engines) covered by a certificate of conformity in operation conform to the regulations, and a description of the program for training of personnel for such maintenance, and the equipment required.

(6) At the option of the manufacturer, the proposed composition of the emission data and durability data test fleet.

(c) Complete copies of the application and of any amendments thereto, and all notifications under §§ 86.077-32, 86.077-33, and 86.077-34 shall be submitted in such multiple copies as the Administrator may require.

§ 86.077-22 Approval of application for certification; test fleet selections.

(a) After a review of the application for certification and any other information which the Administrator may require, the Administrator may approve the application and select a test fleet in accordance with § 86.077-24.

(b) The Administrator may disapprove in whole or in part an application for certification for reasons including incompleteness, inaccuracy, inappropriate proposed mileage (or service) accumulation procedures, test equipment, or fuel, and incorporation of defeat devices in vehicles (or on engines) described by the application.

(c) Where any part of an application is rejected, the Administrator shall notify the manufacturer in writing and set forth the reasons for such rejection. Within 30 days following receipt of such notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objections. If, after the review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.077-6 with respect to such issue.

§ 86.077-23 Required data.

(a) The manufacturer shall perform the tests required by the applicable test procedures, and submit to the Administrator the following information: *Provided, however, That:* (1) If requested by the manufacturer, the Administrator

may waive any requirement of this section for testing of vehicles (or engines) for which emission data are available, or will be made available, under the provisions of § 86.077-29, or

(2) If requested by the manufacturer, the Administrator may waive any requirement of this section for testing of vehicles (or engines) at zero kilometers (or zero hours) of operation.

(b) Durability data on such vehicles (or engines) tested in accordance with the applicable test procedures and in such numbers as specified, which will show the performance of the systems installed on or incorporated in the vehicle (or engine) for extended mileage (or extended operation), as well as a record of all pertinent maintenance (all maintenance and servicing for Diesel heavy-duty engines) performed on the test vehicles (or test engines).

(c) *Emission data.* (1) *Certification vehicles.* (i) Emission data on such vehicles tested in accordance with applicable test procedures and in such numbers as specified, which will show their emissions after zero kilometers (zero miles) and 6436 kilometers (4000 miles) of operation.

(ii) Emission data on those vehicles selected under § 86.077-24(b)(1)(v) and tested in accordance with the applicable test procedures of this part and in such numbers as therein specified, which shall be tested at zero kilometers (zero miles) at any altitude, and under high-altitude conditions after 6436 kilometers (4000 miles) of operation at any altitude.

(2) *Certification engines.* Emission data on such engines tested in accordance with applicable emission test procedures and in such numbers as specified, which will show their emissions after zero hours and 125 hours of operation.

(d) A statement that the vehicles (or engines) for which certification is requested conform to the requirements in § 86.077-5(b) and that the descriptions of tests performed to ascertain compliance with the general standards in § 86.077-5(b) and the data derived from such tests are available to the Administrator upon request.

(e) A statement that the test vehicles (or test engines) with respect to which data are submitted to demonstrate compliance with §§ 86.077-8, 86.077-9, 86.077-10, or § 86.077-11, as applicable, are in all material respects as described in the manufacturer's application for certification, have been tested in accordance with the applicable test procedures utilizing the fuels and equipment described in the application for certification, and that on the basis of such tests the vehicles (or engines) conform to the requirements of the regulations in this part. If such statements cannot be made with respect to any vehicle (or engine) tested, the vehicle (or engine) shall be identified, and all pertinent data relating thereto shall be supplied to the Administrator. If, on the basis of the data supplied and any additional data as required by the Administrator, the Administrator determines that the test vehicle (or test engine) was not as described in the ap-

plication for certification or was not tested in accordance with applicable test procedures utilizing the fuels and equipment as described in the application for certification, the Administrator may make the determination that the vehicle (or engine) does not meet the applicable standards. The provisions of § 86.077-30 (b) shall then be followed.

§ 86.077-24 Test vehicles and engines.

(a) (1) The vehicles or engines covered by an application for certification will be divided into groupings of engines which are expected to have similar emission characteristics throughout their useful life. Each group of engines with similar emission characteristics shall be defined as a separate engine family.

(2) To be classed in the same engine family, engines must be identical in all the following respects:

(i) The cylinder bore center-to-center dimensions.

(ii) The dimension from the centerline of the crankshaft to the centerline of the camshaft.

(iii) The dimension from the centerline of the crankshaft to the top of the cylinder block head face.

(iv) The cylinder block configuration (air cooled or water cooled; L-6, 90° V-8, etc.).

(v) The location of intake and exhaust valves and the valve sizes (within a 1/8-inch range on the valve head diameter).

(vi) The method of air aspiration.

(vii) The combustion cycle.

(viii) Catalytic converter characteristics; gasoline-fueled vehicles and engines only.

(ix) Thermal reactor characteristics; gasoline-fueled vehicles and engines only.

(3) Engines identical in all the respects listed in paragraph (a)(2) of this section may be further divided into different engine families if the Administrator determines that they may be expected to have different emission characteristics. This determination will be based upon a consideration of the following features of each engine.

(i) The bore and stroke.

(ii) The surface-to-volume ratio of the nominally dimensioned cylinder at the top dead center position.

(iii) The intake manifold induction port size and configuration.

(iv) The exhaust manifold port size and configuration.

(v) The intake and exhaust valve sizes.

(vi) The fuel system.

(vii) The camshaft timing and ignition or injection timing characteristics.

(4) Where engines are of a type which cannot be divided into engine families based upon the criteria listed in paragraphs (a)(2) and (3) of this section, the Administrator will establish families for those engines based upon the features most related to their emission characteristics.

(b) *Emission data.* (1) *Emission-data vehicles.* Paragraph (b)(1) of this section applies to light-duty vehicle and light-duty truck emission-data vehicles.

(i) Vehicles will be chosen to be operated and tested for emission data based upon the engine family groupings. Within each engine family, the requirements of this paragraph must be met.

(ii) Vehicles of each engine family will be divided into engine displacement-exhaust emission control system-evaporative emission control system combinations as applicable. A projected sales volume will be established for each combination for the model year for which certification is sought. One vehicle of each combination will be selected in order of decreasing projected sales volume until 70 percent of the projected sales of a manufacturer's total production of vehicles of that engine family is represented, or until a maximum of four vehicles is selected. If any single combination represents over 70 percent, then two vehicles of that combination may be selected. The vehicle selected for each combination will be specified by the Administrator as to such features as transmission type, fuel system, and inertia weight class.

(iii) The Administrator may select a maximum of four additional vehicles within each engine family based upon features indicating that they may have the highest emission levels of the vehicles in that engine family. In selecting these vehicles, the Administrator will consider such features as the emission control system combination, induction system characteristics, ignition system characteristics, fuel system, rated horsepower, rated torque, compression ratio, inertia weight class, transmission options, and axle ratios.

(iv) If the vehicles selected in accordance with paragraphs (b)(1)(ii) and (iii) of this section do not represent each engine-system combination, then one vehicle of each engine-system combination not represented will be selected by the Administrator. The vehicle selected shall be of the engine displacement with the largest projected sales volume of vehicles with the control system combination in the engine family and will be designated by the Administrator as to such features as transmission type, fuel system, and inertia weight class.

(v) The Administrator will also select one vehicle for each engine-system combination within an engine family for which vehicles are to be sold to ultimate purchasers at high altitude.

(vi) The Administrator may combine testing requirements for any vehicle selected under paragraph (b)(1)(v) of this section with the testing requirements for any similar vehicle in the same engine-system combination selected under paragraphs (b)(1)(ii), (iii), or (iv) of this section by requiring a vehicle selected for testing under paragraphs (b)(1)(ii), (iii), or (iv) of this section to be modified (if necessary) after mileage accumulation and emission testing for the purpose of demonstrating compliance in accordance with § 86.077-23(c)(1)(ii).

(2) *Gasoline-fueled heavy-duty emission-data engines.* Paragraph (b)(2) of

this section applies to gasoline-fueled heavy-duty emission-data engines.

(i) Engines will be chosen to be run for emission data based upon the engine family groupings. Within each engine family, the requirements of this paragraph must be met.

(ii) Engines of each engine family will be divided into engine displacement-exhaust emission control system combinations. A projected sales volume will be established for each combination for the applicable model year. One engine of each combination will be selected in order of decreasing projected sales volume until 70 percent of the projected sales of a manufacturer's total production of engines of that family is represented, or until a maximum of four engines is selected. The engines selected for each combination will be specified by the Administrator as to fuel system.

(iii) The Administrator may select a maximum of two additional engines within each engine family based upon features indicating that they may have the highest emission levels of the engines in that engine family. In selecting these engines, the Administrator will consider such features as the exhaust emission control system, induction system characteristics, ignition system characteristics, fuel system, rated horsepower, rated torque, and compression ratio.

(iv) If the engines selected in accordance with paragraphs (b)(2)(i) and (iii) of this section do not represent each engine displacement-exhaust emission control system combination, then one engine of each engine displacement-exhaust emission control system combination not represented shall be selected by the Administrator.

(3) *Diesel heavy-duty emission-data engines.* Paragraph (b)(3) of this section applies to Diesel heavy-duty emission-data engines.

(i) Engines will be chosen to be run for emission data based upon engine family groupings. Within each engine family, the requirements of this paragraph must be met.

(ii) Engines of each engine family will be divided into groups based upon their exhaust emission control systems. One engine of each engine-system combination shall be run for smoke emission data and gaseous emission data as prescribed in § 86.077-26(c)(3). Either the complete gaseous emission test or the complete smoke test may be conducted first. Within each combination, the engine that features the highest fuel feed per stroke, primarily at the speed of maximum rated torque and secondarily at rated speed, will usually be selected. If there are military engines with higher fuel rates than other engines in the same engine-system combination, then one military engine shall be also selected. The engine with the highest fuel feed per stroke will usually be selected.

(iii) The Administrator may select a maximum of one additional engine within each engine-system combination based upon features indicating that it may have the highest emission levels of

the engines of that combination. In selecting this engine, the Administrator will consider such features as the injection system, fuel system, compression ratio, rated speed, rated horsepower, peak torque speed, and peak torque.

(c) *Durability data.* (1) *Durability-data vehicles.* Paragraph (c)(1) of this section applies to light-duty vehicle and light-duty truck durability-data vehicles.

(i) A durability-data vehicle will be selected by the Administrator to represent each engine-system combination. The vehicle selected shall be of the engine displacement with the largest projected sales volume of vehicles with that control-system combination in that engine family and will be designated by the Administrator as to transmission type, fuel system, and inertia weight class.

(ii) A manufacturer may elect to operate and test additional vehicles to represent any engine-system combination. The additional vehicles must be of the same engine displacement, transmission type, fuel system, and inertia weight class as the vehicle selected for that engine-system combination in accordance with the provisions of paragraph (c)(1)(i) of this section. Notice of an intent to operate and test additional vehicles shall be given to the Administrator not later than 30 days following notification of the test fleet selection.

(2) *Gasoline-fueled heavy-duty durability-data engines.* Paragraph (c)(2) of this section applies to gasoline-fueled heavy-duty durability-data engines.

(i) A durability-data engine will be selected by the Administrator to represent each engine-system combination. The engine selected shall be of the displacement with the largest projected sales volume of engines with that exhaust emission control system in that engine family and will be designated by the Administrator as to fuel system.

(ii) [Reserved]

(iii) A manufacturer may elect to operate and test additional engines to represent any engine-system combination. The additional engines must be of the same engine displacement and fuel system as the engine selected for that combination in accordance with the provisions of paragraph (c)(2)(i) of this section. Notice of an intent to run additional engines shall be given to the Administrator not later than 30 days following notification of the test fleet selection. Deterioration factors calculated for each engine-system combination shall be applied separately to military and nonmilitary engines within the same engine-system combination.

(3) *Diesel heavy-duty durability-data engines.* Paragraph (c)(3) of this section applies to Diesel heavy-duty durability-data engines.

(i) One engine from each engine-system combination shall be tested as prescribed in § 86.077-26(c)(3)(ii). At each test point, either the complete gaseous emission test or the complete smoke test may be conducted first. Within each combination, the engine

which features the highest fuel feed per stroke, primarily at rated speed and secondarily at the speed of maximum rated torque, will usually be selected for durability testing. In the case where more than one engine in an engine-system combination has the highest fuel feed per stroke, the engine with the highest maximum rated horsepower will usually be selected for durability testing. If an engine-system combination includes both military and nonmilitary engines, then the nonmilitary engine with the highest maximum rated horsepower will usually be selected for durability testing.

(d) A manufacturer may elect to operate and test additional engines to represent any engine-system combination. The additional engines must be of the same model and fuel system as the engine selected in accordance with the provisions of paragraph (c) (3) (i) of this section. Notice of an intent to test additional engines shall be given to the Administrator not later than 30 days following notification of the test fleet selection. Deterioration factors calculated for each engine-system combination shall be applied separately to military and nonmilitary engines within the same engine-system combination.

(e) For purposes of testing under § 86.077-26(a) (9), (b) (9) or (c) (11), the Administrator may require additional emission-data vehicles (or emission-data engines) and durability-data vehicles (or durability-data engines) identical in all material respects to vehicles (or engines) selected in accordance with paragraphs (b) and (c) of this section: *Provided*, That the number of vehicles (or engines) selected shall not increase the size of either the emission-data fleet or the durability-data fleet by more than 20 percent or one vehicle (or engine) whichever is greater.

(f) Any manufacturer whose projected sales for the model year in which certification is sought is less than

(1) 2000 gasoline-fueled light-duty vehicles, or

(2) 2000 Diesel light-duty vehicles, or

(3) 2000 gasoline-fueled light-duty trucks, or

(4) 2000 Diesel light-duty trucks, or

(5) 700 gasoline-fueled heavy-duty engines, or

(6) 200 Diesel heavy-duty engines, may request a reduction in the number of test vehicles (or engines) determined in accordance with the foregoing provisions of this section. The Administrator may agree to such lesser number as he determines would meet the objectives of this procedure.

(g) In lieu of testing an emission-data or durability-data vehicle (or engine) selected under paragraph (b) or (c) of this section, and submitting data therefore, a manufacturer may, with the prior written approval of the Administrator, submit exhaust emission data and/or fuel evaporative emission data, as applicable on a similar vehicle (or engine) for which certification has previously been obtained or for which all applicable data

required under § 86.077-23 has previously been submitted.

(g) (1) This paragraph applies to light-duty vehicles and light-duty trucks.

(2) Where it is expected that more than 33 percent of an engine family will be equipped with an optional item, the full estimated weight of that item shall be included, unless excluded by the Administrator, in the curb weight computation for each vehicle available with that option in the engine family. Where it is expected that 33 percent or less of the vehicles in an engine family will be equipped with an item of optional equipment, no weight for that item will be added in computing curb weight. In the case of mutually exclusive options, only the weight of the heavier option will be added in computing curb weight. Optional equipment weighing less than 3 pounds per item need not be considered.

(3) Where it is expected that more than 33 percent of an engine family will be equipped with an item of optional equipment that can reasonably be expected to influence emissions, then such items of optional equipment shall actually be installed, unless specifically excluded by the Administrator, on all emission-data and durability-data vehicles in the engine family on which the option is intended to be offered in production. Optional equipment that can reasonably be expected to influence emissions are the air conditioner, power steering, power brakes, and other items determined by the Administrator.

(4) Optional equipment that can reasonably be expected to influence emissions which is utilized on 33 percent or less of the vehicles in the engine family shall not be installed on any vehicle in that engine family unless specifically required under this section.

§ 86.077-25 Maintenance.

(a) *Light-duty vehicles and light-duty trucks.* Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(1) Scheduled maintenance on the engine, emission control system and fuel system of durability-data vehicles shall be scheduled for performance during durability testing at the same mileage intervals that will be specified in the manufacturer's maintenance instructions furnished to the ultimate purchaser of the motor vehicle. Such maintenance shall be performed, except as provided in paragraph (a) (5) (iii) of this section, only under the following provisions:

(i) Scheduled major engine tuneups to manufacturer's specifications may be performed no more frequently than every 12,500 miles of scheduled driving, provided that no tuneup may be performed after 45,000 miles of scheduled driving. A scheduled major engine tuneup shall be restricted to paragraph (a) (1) (i) (A) or (B) of this section, as applicable, and shall be conducted in a manner consistent with service instructions and specifications provided by the manufacturer for use by customer service personnel.

(A) *For gasoline-fueled vehicles,* the following items may be inspected, replaced, cleaned, adjusted, and/or serviced as required:

- (1) Ignition system.
- (2) Cold starting enrichment system (includes fast idle speed setting).
- (3) Curb idle speed and air/fuel mixture.
- (4) Drive belt tension on engine accessories.
- (5) Valve lash.
- (6) Inlet air and exhaust gas control valves.
- (7) Engine bolt torque.
- (8) Spark plugs.
- (9) Fuel filter and air filter.
- (10) Crankcase emission control system.

(11) Fuel evaporative emission control system.

(B) *For Diesel vehicles,* a major engine tuneup shall be restricted to the following:

- (1) Adjust low idle speed.
- (2) Adjust valve lash if required.
- (3) Adjust injector timing.
- (4) Adjust governor.
- (5) Clean and service injector tips.
- (6) Adjust drive belt tension on engine accessories.
- (7) Check engine bolt torque and tighten as required.

(ii) Change of engine and transmission oil, and change or service of oil filter will be allowed at the same mileage intervals that will be specified in the manufacturer's maintenance instructions.

(iii) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to adjustment during scheduled major engine tuneups, once during the first 5,000 miles of vehicle operation.

(2) (i) *For gasoline-fueled vehicles,* unscheduled maintenance on the engine, emission control system and fuel system of durability-data vehicles may be performed, except as provided in paragraph (a) (5) (i) of this section, only under the following provisions:

(A) Any persistently misfiring spark plug may be replaced, in addition to replacement at scheduled major engine tuneup points.

(B) Readjustment of the engine cold starting enrichment system may be performed if there is a problem of stalling or if there is visible black smoke.

(C) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to that performed as scheduled maintenance under paragraph (a) (1) of this section, if the idle speed exceeds the manufacturer's recommended idle speed by 300 r.p.m. or more, or if there is a problem of stalling.

(D) The idle mixture may be reset, other than during scheduled major engine tuneups, only with the advance approval of the Administrator.

(ii) *For Diesel vehicles,* unscheduled maintenance on the engine, emission control system and fuel system of durability-data vehicles may be performed, except as provided in paragraph (a) (5) (i) of this section, only under the following provisions:

(A) Injectors may be changed if a persistent misfire is detected.

(B) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to that performed as scheduled maintenance under paragraph (a) (1) of this section, if the idle speed exceeds the manufacturer's recommended idle speed by 300 r.p.m. or more, or if there is a problem of stalling.

(3) An exhaust gas recirculation (EGR) system may be serviced during durability testing only under one of the following provisions:

(i) Manufacturers may schedule service to the EGR system at the scheduled major engine tuneups if an audible and/or visual signal approved by the Administrator alerts the vehicle operator to the need for EGR system maintenance at each of those mileage points. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of vehicles in use.

(ii) Manufacturers may service the EGR system as unscheduled maintenance a maximum of three times during the 50,000 miles if failure of the EGR system activates an audible and/or visual signal approved by the Administrator which alerts the vehicle operator to the need for EGR system maintenance. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of vehicles in use.

(iii) Manufacturers may service the EGR system a maximum of three times during the 50,000 miles either at a scheduled major engine tuneup point or as unscheduled maintenance, if an audible and/or visual signal approved by the Administrator alerts the vehicle operator to the need for EGR system maintenance. The signal may be activated either by EGR system failure (unscheduled maintenance) or need for scheduled periodic maintenance. If maintenance is performed, the signal for scheduled periodic maintenance shall be reset. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of the vehicles in use.

(iv) Manufacturers may schedule service to the EGR system at the scheduled major engine tuneup(s) if failure to perform EGR system maintenance is not likely, as determined by the Administrator, to result in an improvement in vehicle performance. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of vehicles in use.

(4) The catalytic converter may be serviced once during 50,000 miles if an

audible and/or visual signal approved by the Administrator alerts the vehicle operator to the need for maintenance. The signal may be activated either by component failure or need for maintenance at a scheduled point.

(5) Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on durability-data vehicles shall be performed only with the advance approval of the Administrator.

(i) In the case of unscheduled maintenance, such approval will be given if the Administrator:

(A) Has made a preliminary determination that part failure or system malfunction, or the repair of such failure or malfunction, does not render the vehicle unrepresentative of vehicles in use, and does not require direct access to the combustion chamber, except for spark plug, fuel injection component, or removable prechamber removal or replacement (as applicable); and

(B) Has made a determination that the need for maintenance or repairs is indicated by an overt indication of malfunction such as persistent misfiring, vehicle stalling, overheating, fluid leakage, loss of oil pressure, or charge indicator warning.

(ii) Emission measurements may not be used as a means of determining the need for unscheduled maintenance under paragraph (a) (5) (i) (A).

(iii) Requests for authorization of scheduled maintenance of emission control-related components not specifically authorized to be maintained by these regulations must be made prior to the beginning of durability testing. The Administrator will approve the performance of such maintenance if the manufacturer makes a satisfactory showing that the maintenance will be performed on vehicles in use.

(6) If the Administrator determines that part failure or system malfunction occurrence and/or repair rendered the vehicle unrepresentative of vehicles in use, the vehicle shall not be used as a durability-data vehicle.

(7) Where the Administrator agrees under § 86.077-26 to a mileage accumulation of less than 50,000 miles for durability testing, he may modify the requirements of this paragraph.

(8) (i) Adjustment of engine idle speed on emission-data vehicles may be performed once before the 6436-kilometer (4000-mile) test point. Any other engine, emission control system or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on emission-data vehicles shall be performed only with the advance approval of the Administrator.

(ii) Maintenance on emission-data vehicles selected under § 86.077-24(b) (1) (v) and permitted to be tested for purposes of § 86.077-23(b) (1) (ii) under the provisions of § 86.077-24(b) (1) (vi) may be performed in conjunction with emission control system modifications at the 6436-kilometer (4000-mile) test point, and shall be performed in ac-

cordance with the maintenance instructions to be provided to the ultimate purchaser required under § 86.077-33.

(iii) Maintenance on those emission-data vehicles selected under § 86.077-24 (b) (1) (v) which are not capable of being modified in the field for the purpose of complying with emission standards at an altitude other than intended by the original design may be performed in conjunction with the emission control system modifications at the 6436-kilometer (4000-mile) test point, and shall be approved in advance by the Administrator.

(9) Repairs to vehicle components of the durability-data or emission-data vehicle other than the engine, emission control system, or fuel system, shall be performed only as a result of part failure, vehicle system malfunction, or with the advance approval of the Administrator.

(10) Complete emission tests (see §§ 86.177-5 through 86.177-23) are required, unless waived by the Administrator, before and after any vehicle maintenance which may reasonably be expected to affect emissions. These test data shall be air posted to the Administrator within 24 hours (or delivered within 3 working days) after the test along with a complete record of all pertinent maintenance including a preliminary engineering report of any malfunction diagnosis and corrective action taken. A complete engineering report shall be delivered or air posted to the Administrator within 10 working days after the tests. In addition, all test data and maintenance reports shall be compiled and provided to the Administrator in accordance with § 86.077-23.

(11) The Administrator shall be given the opportunity to verify the existence of an overt indication of part failure and/or vehicle malfunction (e.g., misfiring, stalling, black smoke), or an activation of an audible and/or visual signal, prior to the performance of any maintenance to which such overt indication or signal is relevant under the provisions of this section.

(12) Equipment, instruments, or tools may not be used to identify malfunctioning, maladjusted, or defective engine components unless the same or equivalent equipment, instruments, or tools will be available to dealerships and other service outlets and

(i) Are used in conjunction with scheduled maintenance on such components.

(ii) Are used subsequent to the identification of a vehicle or engine malfunction, as provided in paragraph (a) (5) (i) of this section for durability-data vehicles or paragraph (a) (8) (i) of this section for emission-data vehicles, or

(iii) Unless specifically authorized by the Administrator.

(b) [Reserved]

(c) (1) *Gasoline-fueled heavy-duty engines.* Paragraph (c) of this section applies to gasoline-fueled heavy-duty engines.

(2)(i) Scheduled maintenance may be performed on durability-data engines only under the following provisions:

(A) Major engine tuneups to manufacturer's specifications may be performed no more frequently than every 375 hours of scheduled dynamometer operation, provided no tuneups are performed after 1375 hours of scheduled dynamometer operation. The maintenance to be performed on the durability-data engines shall be requested in the application for certification and shall be specified at the same intervals in the maintenance instructions which will be furnished to the ultimate purchaser of the vehicle in which the engine, which is represented by the test engine, is installed. (For equivalent dynamometer hours, engine hours, and mileage intervals, see § 86.077-2.) A scheduled major engine tuneup shall be restricted to paragraphs (c) (2) (i) (A) (1) through (12) of this section and shall be conducted in a manner consistent with service instructions and specifications provided by the manufacturer for use by the customer service personnel. The following items may be inspected, replaced, cleaned, adjusted, and/or serviced as required:

- (1) Ignition system.
 - (2) Cold starting enrichment system (includes fast idle speed setting).
 - (3) Curb idle speed and air/fuel mixture.
 - (4) Drive belt tension on engine accessories.
 - (5) Valve lash.
 - (6) Inlet air and exhaust gas control valves.
 - (7) Engine bolt torque.
 - (8) Spark plugs.
 - (9) Fuel filter and air filter.
 - (10) Crankcase emission control system.
 - (11) Fuel evaporative emission control system.
 - (12) Exhaust gas recirculation system.
- (B) Change of engine oil, and change or service of oil filter will be allowed at the equivalent intervals that will be specified in the manufacturer's maintenance instructions.

(C) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to during scheduled major engine tuneups, once during the first 125 hours of engine operation.

(ii) Unscheduled maintenance may be performed on durability-data engines, except as provided in paragraph (c) (v) (A) of this section, only under the following provisions:

(A) Any persistently misfiring spark plug may be replaced, in addition to replacement at scheduled major engine tuneup points.

(B) Readjustment of the engine cold starting enrichment system may be performed if there is a problem of stalling or if there is visible black smoke.

(C) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to that performed as scheduled maintenance under paragraph (c) (2) (i) of this section, if the idle speed exceeds the manufacturer's

recommended idle speed by 300 r.p.m. or more, or if there is a problem of stalling.

(D) The idle mixture may be reset, other than during scheduled major engine tuneups, only with the advance approval of the Administrator.

(iii)-(iv) [Reserved]

(v) Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on durability-data engines shall be performed only with the advance approval of the Administrator.

(A) In the case of unscheduled maintenance such approval will be given if the Administrator:

(1) Has made a preliminary determination that part failure or system malfunction, or the repair of such failure or malfunction, does not render the engine unrepresentative of engines in use, and does not require direct access to the combustion chamber, except for spark plug, fuel injection component, or removable prechamber removal or replacement; and

(2) Has made a determination that the need for maintenance or repairs is indicated by an overt indication of malfunction such as persistent misfiring, engine stalling, overheating, fluid leakage, loss of oil pressure, excessive fuel consumption, or excessive power loss.

(B) Emission measurements may not be used as a means of determining the need for unscheduled maintenance under paragraph (c) (2) (v) (A) (1) of this section.

(C) Requests for authorization of scheduled maintenance of emission control-related components not specifically authorized to be maintained by these regulations must be made prior to the beginning of durability testing. The Administrator will approve the performance of such maintenance if the manufacturer makes a satisfactory showing that the maintenance will be performed on engines in use.

(vi) If the Administrator determines that part failure or system malfunction occurrence and/or repair rendered the engine unrepresentative of engines in use, the engine shall not be used as a durability-data engine.

(3)(i) Scheduled maintenance on emission-data engines is limited to the adjustment of idle speed once before the 125-hour test point, provided the idle speed is outside the manufacturer's specifications to be shown on the engine label (see § 86.077-35(a) (2) (iii)).

(ii) Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement shall be performed only with the advance approval of the Administrator.

(4) [Reserved]

(5)(i) Complete emission tests (see §§ 86.777-5 through 86.777-15) are required unless waived by the Administrator, before and after:

(A) Scheduled maintenance approved for durability-data engines.

(B) Unscheduled maintenance which may reasonably be expected to affect emissions.

(ii) The tests before and after scheduled maintenance, which are performed on durability-data engines prior to 117 hours, are waived. The test before scheduled maintenance, which is performed on durability-data engines after 117 hours and prior to 133 hours, is waived. The after-maintenance test must be run and the results used in the deterioration factor calculation in accordance with § 86.077-28(b) (4) (i) (A) (2).

(iii) The idle speed reset and any scheduled maintenance on the emission-data engine shall be performed prior to the 125-hour test. The before-maintenance and after-maintenance tests associated with idle speed reset and scheduled maintenance on the emission-data engine are waived.

(iv) Test data required by this paragraph shall be air posted to the Administrator within 72 hours (or delivered within 5 working days), along with a complete record of all pertinent maintenance.

(v) When unscheduled maintenance is approved, a preliminary engineering report, unless waived by the Administrator, shall be air posted within 72 hours (or delivered within 5 working days). A final engineering report shall be delivered or air posted within 10 working days after the completion of the emission tests. The Administrator may approve an extension of the time requirements for the final engineering report.

(vi) All test data, maintenance reports, and required engineering reports shall be compiled and provided to the Administrator in accordance with § 86.077-23.

(6) The Administrator shall be given the opportunity to verify the existence of an overt indication of part failure and/or engine malfunction (e.g., misfiring, stalling).

(7) Equipment, instruments, or tools may not be used to identify malfunctioning, maladjusted, or defective engine components unless the same or equivalent equipment, instruments, or tools will be available to dealerships and other service outlets, and

(i) Are used in conjunction with scheduled maintenance on such components;

(ii) Are used subsequent to the identification of an engine failure or malfunction, as provided in paragraph (c) (2) (v) (A) of this section for durability-data engines or paragraph (c) (3) of this section for emission-data engines; or

(iii) Unless specifically authorized by the Administrator.

(d) (1) *Diesel heavy-duty engines.* Paragraph (d) of this section applies to Diesel heavy-duty engines.

(2)(i) Scheduled maintenance may be performed on durability-data engines only under the following provisions:

(A) One major engine servicing to manufacturer's specifications may be performed prior to 875 hours (± 8 hours) of scheduled dynamometer operation provided such maintenance is requested in the application for certification and is specified in the maintenance instructions which will be furnished to the ultimate

purchaser of the motor vehicle in which the engine, which is represented by the test engine, is installed. (For equivalent dynamometer hours, engine hours, and mileage intervals, see § 86.077-2.) A scheduled major servicing shall be restricted to paragraphs (d) (2) (1) (A) (1) through (7) of this section and shall be conducted in a manner consistent with service instructions and specifications provided by the manufacturer for use by customer service personnel. The following items may be inspected, replaced, cleaned, adjusted, and/or serviced as required:

- (1) Low idle speed.
- (2) Drive belt tension.
- (3) Engine bolt torque.
- (4) Valve lash.
- (5) Injection timing.
- (6) Injector assemblies.
- (7) Governor settings.

(B) Normal engine servicing such as engine oil change, and oil filter, fuel filter, and air filter cleaning or replacement will be allowed at manufacturer's recommended intervals. If approved in advance by the Administrator, the maintenance for these items may differ from that specified in the manufacturer's maintenance instructions.

(C) Readjustment of the engine low idle speed may be performed once during the first 125 hours of engine operation.

(D) Unscheduled maintenance may be performed on durability-data engines, except as provided in paragraph (d) (2) (v) (A) of this section, only under the following provisions:

(A) Injectors may be changed if a persistent misfire is detected.

(B) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to that performed as scheduled maintenance under paragraph (d) (2) (1) of this section, if the idle speed exceeds the manufacturer's recommended idle speed by 300 r.p.m. or more, or if there is a problem of stalling.

(iii)-(iv) [Reserved]

(v) Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on durability-data engines shall be performed only with the advance approval of the Administrator.

(A) In the case of unscheduled maintenance such approval will be given if the Administrator:

(1) Has made a preliminary determination that part failure or system malfunction, or the repair of such failure or malfunction, does not render the engine unrepresentative of engines in use, and does not require direct access to the combustion chamber, except for fuel injection component, or removable pre-chamber removal or replacement; and

(2) Has made a determination that the need for maintenance or repairs is indicated by an overt indication of malfunction such as persistent misfiring, engine stalling, overheating, fluid leakage, loss of oil pressure, excessive fuel consumption or excessive power loss.

(B) Emission measurements may not be used as a means of determining the

need for unscheduled maintenance under paragraph (d) (2) (v) (A) (1) of this section.

(C) Requests for authorization of scheduled maintenance of emission control related components not specifically authorized to be maintained by these regulations must be made prior to the beginning of durability testing. The Administrator will approve the performance of such maintenance if the manufacturer makes a satisfactory showing that the maintenance will be performed on engines in use.

(vi) If the Administrator determines that part failure or system malfunction occurrence and/or repair rendered the engine unrepresentative of engines in use, the engine shall not be used as a durability-data engine.

(3) (i) Scheduled maintenance on emission-data engines is limited to the adjustment of idle speed once before the 125-hour test point, provided the idle speed is outside the manufacturer's specifications required to be shown on the engine label (see § 86.077-35(a) (3) (iii)).

(ii) Any other engine, emission control system, or fuel system, adjustment, repair, removal, disassembly, cleaning, servicing, or replacement shall be performed only with the advance approval of the Administrator.

(4) [Reserved]

(5) (i) Complete emission tests (see §§ 86.877-5 through 86.877-14 and §§ 86.977-5 through 86.977-15) are required, unless waived by the Administrator, before and after:

(A) Scheduled maintenance approved for durability-data engines.

(B) Unscheduled maintenance which may reasonably be expected to affect emissions.

(ii) The tests before and after scheduled maintenance, which are performed on durability-data engines prior to 117 hours, are waived. The test before scheduled maintenance, which is performed on durability-data engines after 117 hours and prior to 133 hours, is waived. The after-maintenance test must be run and the results used in the deterioration factor calculation in accordance with § 86.077-28(c) (4) (i) (B) or (C).

(iii) The idle speed reset and any scheduled maintenance on the emission-data engine shall be performed prior to the 125-hour test. The before-maintenance and after-maintenance tests associated with idle speed reset and scheduled maintenance on the emission-data engine are waived.

(iv) Test data required by this paragraph shall be air posted to the Administrator within 72 hours of test completion (or delivered within 5 working days), along with a complete record of all pertinent maintenance.

(v) When unscheduled maintenance is approved, a preliminary engineering report, unless waived by the Administrator, shall be air posted within 72 hours (or delivered within 5 working days). A final engineering report shall be delivered or air posted within 10 working days after the completion of the emission tests. The Administrator may ap-

prove an extension of the time requirements for the final engineering report.

(vi) All test data, maintenance reports, and required engineering reports shall be compiled and provided to the Administrator in accordance with § 86.077-23.

(6) The Administrator shall be given the opportunity to verify the existence of an overt indication of part failure and/or engine malfunction (e.g., misfiring, stalling).

(7) Equipment, instruments, or tools may not be used to identify malfunctioning, maladjusted, or defective engine components unless the same or equivalent equipment, instruments, or tools will be available to dealerships and other service outlets and

(i) Are used in conjunction with scheduled maintenance on such components;

(ii) Are used subsequent to the identification of an engine failure or malfunction, as provided in paragraph (d) (2) (v) (A) of this section for durability-data engines or paragraph (d) (3) of this section for emission-data engines; or

(iii) Unless specifically authorized by the Administrator.

§ 86.077-26 Mileage and service accumulation; emission measurements.

(a) (1) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The procedure for mileage accumulation will be the Durability Driving Schedule as specified in Appendix IV of this part. A modified procedure may also be used if approved in advance by the Administrator. Except with the advance approval of the Administrator, all vehicles will accumulate mileage at a measured curb weight which is within 100 pounds of the estimated curb weight. If the loaded vehicle weight is within 100 pounds of being included in the next higher inertia weight class as specified in § 86.177-11(d), the manufacturer may elect to conduct the respective emission tests at the inertia weight corresponding to the higher loaded vehicle weight.

(3) Emission-data vehicles: Unless as otherwise provided for in § 86.077-23(a), emission-data vehicles shall be operated and tested as follows:

(i) *Gasoline-fueled.* (A) Each gasoline-fueled emission-data vehicle shall be driven 6436 kilometers (4000 miles) with all emission control systems installed and operating. Complete exhaust emission and fuel evaporative emission tests (see § 86.177-5(a)) shall be conducted at zero kilometers (zero miles) and 6436 kilometers (4000 miles) unless the Administrator determines, based on data submitted under § 86.077-24(f), that only the exhaust emission test (see § 86.177-5(b)) shall be conducted at zero kilometers (zero miles) and 6436 kilometers (4000 miles).

(B) The emission-data vehicle(s) selected for testing under § 86.077-24(b) (1) (v) shall be driven 6436 kilometers (4000 miles) at any altitude. Emission tests shall be conducted at zero kilometers (zero miles) at any altitude and

6436 kilometers (4000 miles) under high altitude conditions.

(C) The emission-data vehicle(s) selected for testing under § 86.077-24(b) (1) (v) and permitted to be tested for purposes of § 86.077-23(c) (1) (ii) under the provisions of § 86.077-24(b) (1) (vi) shall be driven 6436 kilometers (4000 miles) at low altitude. Emission tests shall be conducted at zero kilometers (zero miles) at low altitude and 6436 kilometers (4000 miles) under both low- and high-altitude conditions. For the purposes of this subparagraph, "low altitude" means any elevation less than 549 meters (1800 feet).

(ii) *Diesel.* (A) Each Diesel emission-data vehicle shall be driven 6436 kilometers (4000 miles) with all emission control systems installed and operating. Emission tests shall be conducted at zero kilometers (zero miles) and 6436 kilometers (4000 miles).

(B) The emission-data vehicle(s) selected for testing under § 86.077-24(b) (1) (v) shall be driven 6436 kilometers (4000 miles) at any altitude. Emission tests shall be conducted at zero kilometers (zero miles) at any altitude and 6436 kilometers (4000 miles) under high altitude conditions.

(C) The emission-data vehicle(s) selected for testing under § 86.077-24(b) (1) (v) and permitted to be tested for purposes of § 86.077-23(c) (1) (ii) under the provisions of § 86.077-24(b) (1) (vi) shall be driven 6436 kilometers (4000 miles) at low altitude. Emission tests shall be conducted at zero kilometers (zero miles) at low altitude and 6436 kilometers (4000 miles) under both low- and high-altitude conditions. For the purpose of this subparagraph "low altitude" means any elevation less than 549 meters (1800 feet).

(4) Durability-data vehicles: Unless as otherwise provided for in § 86.077-23(a), durability-data vehicles shall be operated and tested as follows:

(i) *Gasoline-fueled.* Each gasoline-fueled durability-data vehicle shall be driven, with all emission control systems installed and operating, for 50,000 miles or such lesser distance as the Administrator may agree to as meeting the objective of this procedure. Complete exhaust emission and fuel evaporative emission tests (see § 86.177-5(a)) shall be made at the following mileage points: 0, 5,000, 10,000, 15,000, 20,000, 25,000, 30,000, 35,000, 40,000, 45,000 and 50,000, unless the Administrator determines based on data submitted under § 86.077-24(f) that only the exhaust emission tests (see § 86.177-5(b)) shall be made at the mileage points specified in this paragraph.

(ii) *Diesel.* Each Diesel durability-data vehicle shall be driven, with all emission control systems installed and operating, for 50,000 miles or such lesser distance as the Administrator may agree to as meeting the objectives of this procedure. Complete emission tests (see §§ 86.177-6 through 86.177-23) shall be made at the following mileage points: 0, 5,000, 10,000, 15,000, 20,000, 25,000, 30,000, 35,000, 40,000, 45,000, and 50,000.

(5) All tests required by this subpart to be conducted after every 5,000 miles of driving for durability-data vehicles and 4,000 miles for emission-data vehicles must be conducted at any accumulated mileage within 250 miles of each of those test points.

(6) (i) The results of each emission test shall be supplied to the Administrator immediately after the test. The manufacturer shall furnish to the Administrator explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided test. If a manufacturer conducts multiple tests at any test point at which the data are intended to be used in the calculation of the deterioration factor, the number of tests must be the same at each point and may not exceed three valid tests. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) shall be air posted to the Administrator within 24 hours (or delivered within 3 working days). In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.077-23. Where the Administrator conducts a test on durability-data vehicle at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be rounded, using the "Rounding Off Method" specified in ASTM E 29-67, to the number of places to the right of the decimal point indicated by expressing the applicable emission standards of this subpart to three significant figures.

(7) Whenever the manufacturer proposes to operate and test a vehicle which may be used for emission or durability data, he shall provide the zero-mile test data to the Administrator (except for those vehicles for which the zero-mile test requirement has been waived under § 86.077-23(a) (2)) and make the vehicle available for such testing under § 86.077-29 as the Administrator may require before beginning to accumulate mileage on the vehicle. Failure to comply with this requirement will invalidate all test data submitted for this vehicle.

(8) Once a manufacturer begins to operate an emission-data or durability-data vehicle, as indicated by compliance with paragraph (a) (7) of this section, he shall continue to run the vehicle to 4,000 miles or 50,000 miles, respectively, and the data from the vehicle will be used in the calculations under § 86.077-28. Discontinuation of a vehicle shall be allowed only with the written consent of the Administrator.

(9) (i) The Administrator may elect to operate and test any test vehicle during all or any part of the mileage accumulation and testing procedure. In such cases, the manufacturer shall provide the vehicle(s) to the Administrator with all information necessary to conduct this testing.

(ii) The test procedures in §§ 86.177-5 through 86.177-23 will be followed by the Administrator. The Administrator will

test the vehicles at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other vehicles of that combination to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall be used in the determination of deterioration factors.

(10) Emission testing of any type with respect to any certification vehicle other than that specified in this part is not allowed except as such testing may be specifically authorized by the Administrator.

(b) (1) Paragraph (b) of this section applies to gasoline-fueled heavy-duty engines.

(2) The engine dynamometer service accumulation schedule will consist of several operating conditions which give the same percentage of time at various manifold vacuums and modes as specified in the emission test cycle. The average speed shall be between 1,650 and 1,700 r.p.m. Subject to the requirements as to average speed, there must be operation at speeds in excess of 3,200 r.p.m. (but not in excess of governed speed for governed engines or rated speed for non-governed engines) for a cumulative maximum of 0.5 percent of the actual cycle time, excluding time in transient conditions. Maximum cycle time shall be 15 minutes. A cycle approved in advance by the Administrator shall be used.

(3) Emission-data engines: Unless as otherwise provided for in § 86.077-23(a), emission-data engines shall be operated and tested as follows: Each emission-data engine shall be operated for 125 hours with all emission control systems installed and operating. Emission tests shall be conducted at zero and 125 hours. Evaporative emission controls need not be connected provided normal operating conditions are maintained in the engine induction system.

(4) Durability-data engines: Unless as otherwise provided for in § 86.077-23(a), durability-data engines shall be operated and tested as follows: Each durability-data engine shall be operated, with all emission control systems installed and operating, for 1,500 hours. Emission tests shall be conducted at zero hours and at each 125-hour interval. Evaporative emission controls need not be connected provided normal operating conditions are maintained in the engine induction system.

(5) All tests required by this subpart to be conducted after 125 hours of operation or at any multiple of 125 hours may be conducted at any accumulated number of hours within 8 hours of 125 hours or the appropriate multiple of 125 hours, respectively.

(6) (i) The results of each emission test shall be supplied to the Administrator within 72 hours (or delivered within

5 working days). The manufacturer shall furnish to the Administrator an explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided test. If a manufacturer conducts multiple tests at any test point at which the data are intended to be used in the calculation of the deterioration factor, the number of tests must be the same at each point and may not exceed three valid tests. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) shall be air posted to the Administrator within 72 hours (or delivered within 5 working days). In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.077-23. Where the Administrator conducts a test on a durability-data engine at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be recorded and reported to the Administrator using two places to the right of the decimal point. These numbers shall be rounded in accordance with the "Rounding Off Method" specified in ASTM E 29-67.

(7) Whenever the manufacturer proposes to operate and test an engine which may be used for emission or durability data, he shall provide the zero-hour test data to the Administrator (except for those engines for which the zero-hour test requirement has been waived under § 86.077-23(a)(2)) and make the engine available for such testing under § 86.077-29 as the Administrator may require before beginning to accumulate hours on the engine. Failure to comply with this requirement will invalidate all test data later submitted for this engine.

(8) Once a manufacturer begins to operate an emission-data or durability-data engine, as indicated by compliance with paragraph (b)(7) of this section, he shall continue to run the engine to 125 hours or 1,500 hours, respectively, and the data from the engine will be used in the calculations under § 86.777-15. Discontinuation of an engine shall be allowed only with the prior written consent of the Administrator.

(9)(i) The Administrator may elect to operate and test any test engine during all or any part of the service accumulation and testing procedure. In such cases the manufacturer shall provide the engine(s) to the Administrator with all information necessary to conduct the testing.

(ii) The test procedures (§§ 86.777-5 through 86.777-15) will be followed by the Administrator. The Administrator will test the engines at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other engines of that combi-

nation to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall be used in the determination of deterioration factors.

(10) Emission testing of any type with respect to any certification engine other than that specified in this subpart is not allowed except as such testing may be specifically authorized by the Administrator.

(c)(1) Paragraph (c) of this section applies to Diesel heavy-duty engines.

(2) The procedures set forth in this section describe the service accumulation that shall be accomplished on each test engine and when tests are to be conducted.

(3)(i) Emission-data engines: Unless as otherwise provided for in § 86.077-23 (a), emission-data engines shall be operated and tested as follows: Each emission-data engine shall be operated for 125 hours with all emission control systems installed and operating. Emission tests shall be conducted at zero and 125 hours.

(ii) Durability-data engines: Unless as otherwise provided for in § 86.077-23 (a), durability-data engines shall be operated and tested as follows: Each durability-data engine shall be operated, with all emission control systems installed and operating, for 1,000 hours. Emission tests shall be conducted at zero hours and at each 125-hour interval.

(4) A break-in procedure, not to exceed 20 hours, may be run if approved in writing in advance by the Administrator. This procedure would run after the zero-hour test, and the hours accumulated would not be counted as part of the service accumulation.

(5) Before service accumulation can begin, the following criteria must be met. Failure to comply with these requirements shall invalidate all test data submitted for an engine.

(i) Each engine shall produce at least 95 percent of the maximum horsepower, corrected to rating conditions, at 95 to 100 percent of the rated speed.

(ii) The fuel rate at maximum horsepower shall be within manufacturer's specifications.

(iii) The zero-hour test data shall be provided to the Administrator (except for those engines for which the zero-hour test requirement has been waived under § 86.077-23(a)(2)) and the engine shall be made available for such testing under § 86.077-29 as the Administrator may require.

(6) During service accumulation, hours can be credited toward the required service accumulation hours when the following criteria are met. If these criteria cannot be met, engine operation shall be discontinued and the Administrator shall be notified immediately. (Adjustments to the fuel rate can be approved under the provisions of § 86.077-25).

(i) Each engine shall produce at least 95 percent of the maximum horsepower,

at 95 to 100 percent of the rated speed, observed during zero-hour testing. Horsepower values shall be corrected to the rating conditions.

(ii) The engine shall be operated at 75 percent of the inlet and exhaust restrictions specified in § 86.877-8 except that the tolerance will be ± 3 inches of water and ± 0.5 inches of Hg respectively.

(7) During each emission test the inlet and exhaust restrictions shall be as specified in § 86.877-8.

(8) Tests, other than zero-hour tests, may be conducted within eight (8) hours of the nominal test point.

(9)(i) The results of each emission test shall be air posted to the Administrator within 72 hours of test completion (or delivered within 5 working days). The manufacturer shall furnish to the Administrator an explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided test. If a manufacturer conducts multiple tests (not to exceed three valid tests) at any test point, the number of tests must be the same at each point. The data obtained from all valid tests shall be used in the calculation of the deterioration factor. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) shall be air posted to the Administrator within 72 hours (or delivered within 5 working days). In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.077-23. Where the Administrator conducts a test on a durability-data engine at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be recorded and reported to the Administrator using two places to the right of the decimal point. These numbers shall be rounded in accordance with the "Rounding Off Method" specified in ASTM E 29-67.

(10) Once a manufacturer begins to operate an emission-data or durability-data engine, as indicated by compliance with paragraph (c) of this section, he shall continue to run the engine to 125 hours or 1,000 hours respectively, and the data from the engine shall be used in the calculations under §§ 86.877-14 and 86.977-15. Discontinuation of an engine shall be allowed only with the prior written consent of the Administrator.

(11)(i) The Administrator may elect to operate and test any test engine during all or any part of the service accumulation and testing procedure. In such cases, the manufacturer shall provide the engine(s) to the Administrator with all information necessary to conduct the testing.

(ii) The test procedures (§§ 86.877-5 through 86.877-14 and §§ 86.977-5 through 86.977-15) will be followed by the Administrator. The Administrator will test the engines at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other engines of that combination to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall be used in the determination of deterioration factors.

(12) Emission testing of any type with respect to any certification engine other than that specified in this part is not allowed except as such testing may be specifically authorized by the Administrator.

§ 86.077-27 Special test procedures.

(a) For light-duty vehicles or light-duty trucks, the Administrator may, on the basis of a written application therefore by a manufacturer, prescribe test procedures other than those set forth in this part for any motor vehicle which he determines is not susceptible to satisfactory testing by the procedures set forth in Subpart B.

(b) For heavy-duty engines, the Administrator may prescribe test procedures other than those set forth in this part for any motor vehicle engine which he determines is not susceptible to satisfactory testing by the procedures set forth in Subparts H, I, or J.

§ 86.077-28 Compliance with emission standards.

(a) (1) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The applicable exhaust and fuel evaporative emission standards of this subpart apply to the emissions of vehicles for their useful life.

(3) Since it is expected that emission control efficiency will change with mileage accumulation on the vehicle, the emission level of a vehicle which has accumulated 50,000 miles will be used as the basis for determining compliance with the standards.

(4) The procedure for determining compliance of a new motor vehicle with exhaust and fuel evaporative emission standards, as applicable, is as follows:

(i) Separate emission deterioration factors shall be determined from the emission results of the durability-data vehicle(s) for each engine-system combination. A separate factor shall be established for exhaust HC, exhaust CO, exhaust NO_x, and fuel evaporative HC, as applicable.

(A) The applicable results to be used in determining the deterioration factors for each combination shall be:

(1) All valid emission data from the tests required under § 86.077-26(a) (4), except the zero-mile tests. This shall include the official test results, as determined in § 86.077-29 for all tests conducted on all durability-data vehicles of the combination selected under § 86.077-24(c) (including all vehicles elected to be operated by the manufacturer under § 86.077-24(c) (1) (ii)).

(2) All emission data from the tests conducted before and after the scheduled maintenance provided in § 86.077-25.

(3) All emission data from tests required by maintenance approved under § 86.077-25, in those cases where the Administrator conditioned his approval for the performance of such maintenance on the inclusion of such data in the deterioration factor calculation.

(B) All applicable results shall be plotted as a function of the mileage on the system, rounded to the nearest mile, and the best fit straight lines, fitted by the method of least squares, shall be drawn through all these data points. The interpolated 4,000- and 50,000-mile points on this line must be within the standards provided in §§ 86.077-8 or 86.077-9, as applicable, or the data will not be acceptable for use in calculation of a deterioration factor, unless no applicable data point exceeded the standard.

(C) An exhaust emission deterioration factor shall be calculated for each combination as follows:

Factor = exhaust emissions interpolated to 50,000 miles divided by exhaust emissions interpolated to 4,000 miles.

These interpolated values shall be carried out to a minimum of four places to the right of the decimal point before dividing one by the other to determine the deterioration factor. The results shall be rounded to three places to the right of the decimal point in accordance with ASTM E 29-67.

(D) For gasoline-fueled vehicles, an evaporative emission deterioration factor shall be calculated for each combination by subtracting the evaporative emissions interpolated to 4,000 miles from the evaporative emissions interpolated to 50,000 miles. These interpolated values shall be carried out, in accordance with ASTM E 29-67, to a minimum of three decimal places to the right of the decimal point before subtracting one from the other to determine the deterioration factor.

(ii) (A) The exhaust emission test results for each emission-data vehicle shall be multiplied by the appropriate deterioration factor. *Provided*, That if a deterioration factor as computed in paragraph (a) (4) (i) (C) of this section is less than one, that deterioration factor shall be one for the purposes of this paragraph.

(B) The evaporative emission test results for each combination shall be adjusted by addition of the appropriate deterioration factor. *Provided*, That if a deterioration factor as computed in paragraph (a) (4) (i) (D) of this section is less than zero, that deterioration factor shall be zero for the purposes of this paragraph.

(iii) The emissions to compare with the standard shall be the adjusted emissions of paragraphs (a) (4) (ii) (A) and (B) of this section for each emission-data vehicle. Before any emission value is compared with the standard, it shall be rounded, in accordance with ASTM E 29-67, to two significant figures. The rounded emission values may not exceed the standard.

(iv) Every test vehicle of an engine family must comply with all applicable standards, as determined in paragraph (a) (4) (iii) of this section, before any vehicle in that family may be certified.

(b) (1) Paragraph (b) of this section applies to gasoline-fueled heavy-duty engines.

(2) The exhaust emission standards in § 86.077-10 apply to the emissions of engines for their useful life.

(3) Since emission control efficiency decreases with the accumulation of hours on the engine, the emission level of an engine which has accumulated 1,500 hours of dynamometer operation will be used as the basis for determining compliance with the standards.

(4) The procedure for determining compliance of a new engine with exhaust emission standards is as follows:

(i) Separate emission deterioration factors shall be determined from the emission results of the durability-data engines for each engine-system combination. Separate factors shall be established for CO and for the combined emissions of HC and NO_x.

(A) The applicable results to be used in determining the deterioration factors for each combination shall be:

(1) All valid emission data from the test required under § 86.077-26(b) (4), except the zero-hour tests. This shall include the official test results, as determined in § 86.077-29, for all tests conducted on all durability-data engines of the combination selected under § 86.077-24(c) (2) (including all engines elected to be operated by the manufacturer under § 86.077-24(c) (2) (iii)).

(2) All emission data from the test conducted before and after maintenance provided in § 86.077-25(c) (2) (i) (A).

(3) All emission data from the test conducted before and after maintenance provided in § 86.077-25(c) (2) (v) (C) if emission tests were conducted.

(B) All applicable emission results for (1) HC+NO_x and (2) CO shall be plotted as a function of durability hours which shall be consistently rounded to the nearest hour. Emission data shall have two figures to the right of the decimal. The best fit straight lines ((1) HC+NO_x and (2) CO), fitted by the method of least squares, shall be drawn through these data points. The interpolated 125-hour and 1500-hour points on each line, rounded to whole numbers in accordance with ASTM E 29-67, must be within the standards specified in § 86.077-10 or the data shall not be used in the calculation of a deterioration factor, unless no applicable data points exceed the standards.

(C) The interpolated values shall be used to calculate a deterioration factor as follows:

Factor = Exhaust emissions interpolated to 1500 hours minus the exhaust emissions interpolated to 125 hours. (Negative deterioration factors shall be considered zero.)

(ii) The appropriate deterioration factor, carried out to two places to the right of the decimal point, shall be added to the exhaust emission test results, carried out to two places to the right of

the decimal point, for each emission-data engine.

(iii) The emission values to compare with the standards shall be the adjusted emission values of paragraph (b) (4) (ii) of this section rounded to whole numbers in accordance with ASTM E 29-67 for each emission-data engine.

(iv) Every test engine of an engine family must comply with all applicable standards, as determined in paragraph (b) (4) (iii) of this section, before any engine in that family will be certified.

(c) (1) Paragraph (c) of this section applies to Diesel heavy-duty engines.

(2) The emission standards in § 86.077-11 apply to the emissions of engines for their useful lives.

(3) Since emission control efficiency decreases with accumulation of hours on the engine, the emission level of an engine which has accumulated 1,000 hours of dynamometer operation will be used as the basis for determining compliance with the standards.

(4) The procedure for determining compliance with emission standards for Diesel heavy-duty engines is as follows:

(i) Emission deterioration factors for the acceleration mode (designated as "A"), the lugging mode (designated as "B"), the peak opacity (designated as "C"), the CO exhaust emissions, and the HC+NO_x exhaust emissions shall be established separately for each engine-system combination.

(A) The applicable results to be used in determining the deterioration factors for each combination shall be:

(1) All emission data from the tests required under § 86.077-26(c) (3) (ii), except the zero-hour tests. This shall include the official test results, as determined in § 86.077-29, for all tests conducted on all durability-data engines of the combination selected under § 86.077-24(c) (3) (i) (including all engines selected to be operated by the manufacturer under § 86.077-24(c) (3) (ii)).

(2) All emission data from the tests conducted before and after the maintenance provided in § 86.077-25(d) (2) (i) (A) if emission tests were conducted.

(3) All emission data from the tests conducted before and after maintenance provided in § 86.077-25(d) (2) (v) (C) if emission tests were conducted.

(B) All applicable emission results for (1) HC+NO_x, (2) CO, (3) acceleration smoke ("a"), (4) lugging smoke ("b"), and (5) peak smoke ("c") shall be plotted as a function of durability hours which shall be consistently rounded to the nearest hour. Emission data shall have two figures to the right of the decimal. The best fit straight lines, fitted by the method of least squares, shall be drawn through these data points. The interpolated 125- and 1000-hour points on each line, rounded to whole numbers in accordance with ASTM E 29-67, must be within the standards specified in § 86.077-11 or the data shall not be used in the calculation of the deterioration factor, unless no applicable data points exceeded the standards.

(C) The interpolated values shall be used to calculate a deterioration factor as follows:

Factor—Exhaust emissions (both smoke and gaseous) interpolated to 1000 hours minus the exhaust emissions interpolated to 125 hours. (Negative deterioration factors shall be considered zero).

(ii) The appropriate deterioration factor, carried out to two places to the right of the decimal point, shall be added to the exhaust emission test results, carried out to two places to the right of the decimal point, for each emission-data engine.

(iii) The emission values to compare with the standards shall be the adjusted emission values of paragraph (c) (4) (ii) of this section rounded to whole numbers in accordance with ASTM E 29-67 for each emission-data engine.

(iv) Every test engine of an engine family must comply with all applicable standards, as determined in paragraph (c) (4) (iii) of this section, before any engine in that family will be certified.

§ 86.077-29 Testing by the Administrator.

(a) (1) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The Administrator may require that any one or more of the test vehicles be submitted to him, at such place or places as he may designate, for the purposes of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(3) (i) Whenever the Administrator conducts a test on a test vehicle, the results of that test shall, unless subsequently invalidated by the Administrator, comprise the official data for the vehicle at the prescribed test point and the manufacturer's data for that prescribed test point shall not be used in determining compliance with emission standards.

(ii) Whenever the Administrator does not conduct a test on a test vehicle at a test point, the manufacturer's test data will be accepted as the official data for that test point, *Provided*, That if the Administrator makes a determination based on testing under paragraph (a) (2) of this section, that there is a lack of correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer, *And further provided*, That if the Administrator has reasonable basis to believe that any test data submitted by the manufacturer are not accurate or have been obtained in violation of any provisions of this part, the Administrator may refuse to accept those data as the official data pending retesting or submission or further information.

(iii) (A) The emission-data vehicle presented to the Administrator for testing shall be calibrated within the production tolerances applicable to the manufacturer's specifications to be shown on the vehicle label (see § 86.077-35 (a) (1) (iii) (D)) as specified in the application for certification. If the Administrator determines that a vehicle is not within such tolerances, the vehicle shall be adjusted, at the facility designated by the Administrator, prior to the test and an engineering report shall be submitted to the Administrator describing the corrective action taken. Based on the engineering report, the Administrator will determine if the vehicle shall be used as an emission-data vehicle.

(B) If the Administrator determines that the test data developed under paragraph (a) (3) (iii) (A) of this section would cause an emission-data vehicle to fail due to excessive 4,000 mile emissions or by application of the appropriate deterioration factor, then the following procedure shall be observed:

(1) The manufacturer may request a retest. Before the retest, the vehicle may be readjusted to manufacturer's specifications, if these adjustments were made incorrectly prior to the first test, and other maintenance or repairs may be performed in accordance with § 85.077-25. All work on the vehicle shall be done at such location and under such conditions as the Administrator may prescribe.

(2) The vehicle will be retested by the Administrator and the results of this test shall comprise the official data for the emission-data vehicle.

(iv) If sufficient durability data are not available at the time of any emission test conducted under paragraph (a) (2) of this section to enable the Administrator to determine whether an emission-data vehicle would fail, the manufacturer may request a retest in accordance with the provisions of paragraphs (a) (3) (iii) (A) and (B) of this section. If the manufacturer does not promptly make such request, he shall be deemed to have waived the right to a retest. A request for retest must be made before the manufacturer removes the vehicle from the test premises.

(b) (1) Paragraph (b) of this section applies to heavy-duty engines.

(2) The Administrator may require that any one or more of the test engines be submitted to him, at such place or places as he may designate, for the purpose of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(3) (i) Whenever the Administrator conducts a test on a test engine the results of that test, unless subsequently invalidated by the Administrator, shall comprise the official data for the engine at that prescribed test point and the manufacturer's data for that prescribed

test point shall not be used in determining compliance with emission standards.

(ii) Whenever the Administrator does not conduct a test on a test engine at a test point, the manufacturer's test data will be accepted as the official data for that test point, *Provided*, That if the Administrator makes a determination based on testing under paragraph (b) (2) of this section, that there is a lack of correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer, *And further provided*, That if the Administrator has reasonable basis to believe that any test data submitted by the manufacturer is not accurate or has been obtained in violation of any provision of this part, the Administrator may refuse to accept that data as the official data pending retesting or submission of further information.

(iii) (A) The emission-data engine presented to the Administrator for testing shall be calibrated within the production tolerances applicable to the manufacturer's specifications to be shown on the engine label (see § 86.077-35(a) (2) (iii)) as specified in the application for certification. If the Administrator determines that an engine is not within such tolerances, the engine shall be adjusted at the facility designated by the Administrator prior to the test and an engineering report shall be submitted to the Administrator describing the corrective action taken. Based on the engineering report the Administrator will determine if the engine shall be used as an emission-data engine.

(B) If the Administrator determines that the test data developed under paragraph (b) (3) (iii) (A) of this section would cause the emission-data engine to fail due to excessive 125-hour emission values or by the application of the appropriate deterioration factor, then the following procedure shall be observed.

(1) The manufacturer may request a retest. Before the retest, the engine may be readjusted to manufacturer's specifications, if these adjustments were made incorrectly prior to the first test, and other maintenance or repairs may be performed in accordance with § 86.077-25. All work on the engine shall be done at such location and under such conditions as the Administrator may prescribe.

(2) The engine will be retested by the Administrator and the results of this test shall comprise the official data for the emission-data engine.

(iv) If sufficient durability data are not available at the time of any emission test conducted under paragraph (b) (2) of this section to enable the Administrator to determine whether an emission-data engine would fail, the manufacturer may request a retest in accordance with the provisions of paragraphs (b) (3) (iii) (B) (1) and (2) of this section. If the manufacturer does not promptly make such request, he shall be deemed to have waived the right to a retest. A request for retest must be made before the manufac-

turer removes the engine from the test premises.

§ 86.077-30 Certification.

(a) (1) If, after a review of the test reports and data submitted by the manufacturer, data derived from any inspection carried out under § 86.077-7(c) and any other pertinent data or information, the Administrator determines that a test vehicle(s) (or test engine(s)) meets the requirements of the Act and of this subpart, he will issue a certificate of conformity with respect to such vehicle(s) (or engine(s)) except in cases covered by paragraph (c) of this section. If applicable, the certificate will state which vehicles are certified for sale at high altitude.

(2) Such certificate will be issued for such period not to exceed one model year as the Administrator may determine and upon such terms as he may deem necessary to assure that any new motor vehicle (or new motor vehicle engine) covered by the certificate will meet the requirements of the Act and of this part. Each such certificate shall contain the following language:

This certificate covers only those new motor vehicles (or new motor vehicle engines) which conform, in all material respects, to the design specifications that applied to those vehicles (or engines) described in the application for certification and which are produced during the ---- model year production period of the said manufacturer, as defined in 40 CFR 86.077-2.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 86.077-7(c) which concern either the vehicle (or engine) certified, or any production vehicle (or production engine) covered by this certificate, or any production vehicle (or production engine) which when completed will be claimed to be covered by this certificate. Failure to comply with all the requirements of § 86.077-7(c) with respect to any such vehicle (or engine) may lead to revocation or suspension of this certificate as specified in 40 CFR 86.077-30(c). It is also a term of this certificate that this certificate may be revoked or suspended for the other reasons stated in § 86.077-30 (c) or (d).

(3) One such certificate will be issued for each engine family and will certify compliance with no more than one set of applicable standards.

(4) A violation of section 203(a) (1) of the Clean Air Act occurs when any manufacturer sells, offers for sale, introduces or delivers for introduction into commerce, any light-duty vehicle or light-duty truck, subject to the regulations under the Act, which is not covered by a certificate of conformity at high altitude issued under this part:

(i) At a designated high-altitude location, unless such manufacturer has substantial reason to believe that such motor vehicle will not be sold to an ultimate purchaser for principal use at a designated high-altitude location; or,

(ii) At an other than a designated high-altitude location, when such manufacturer has reason to believe that such motor vehicle is intended by the ultimate purchaser to be used principally at a designated high-altitude location.

(5) For the purpose of paragraph (a) of this section, "designated high-altitude location" is any county which has substantially all of its area located above 1219 meters (4,000 feet) and which is identified below.

COUNTIES LOCATED SUBSTANTIALLY ABOVE 1,219 METERS (4,000 FEET) IN ELEVATION

STATE OF ARIZONA	
Apache	Navajo
STATE OF COLORADO	
Adams	Jefferson
Alamosa	Lake
Arapahoe	La Plata
Archuleta	Larimer
Boulder	Las Animas
Chaffee	Lincoln
Clear Creek	Mesa
Conejos	Mineral
Cochise	Moffat
Crowley	Montezuma
Custer	Montrose
Dolores	Morgan
Delta	Ouray
Denver	Park
Douglas	Pitkin
Eagle	Pueblo
Elbert	Rio Blanco
El Paso	Rio Grande
Fremont	Routt
Garfield	Saguache
Gilpin	San Juan
Grand	San Miguel
Gunnison	Summit
Hinsdale	Teller
Huerfano	Washington
Jackson	Weld
STATE OF IDAHO	
Bannock	Custer
Bear Lake	Franklin
Bingham	Fremont
Blaine	Jefferson
Bonneville	Madison
Butte	Minidoka
Camas	Oneida
Caribou	Power
Cassia	Teton
Clark	Valley
STATE OF MONTANA	
Beaverhead	Madison
Deer Lodge	Meagher
Gallatin	Park
Jefferson	Silver Bow
STATE OF NEBRASKA	
Bandier	Sioux
Kimball	
STATE OF NEVADA	
Carson City	Lander
Douglas	Lyon
Elko	Mineral
Esmeralda	Storey
Eureka	White Pine
Humboldt	
STATE OF NEW MEXICO	
Bernalillo	Mora
Catron	Rio Arriba
Colfax	Sandoval
Curry	San Juan
De Baca	San Miguel
Grant	Santa Fe
Guadalupe	Sierra
Harding	Socorro
Lincoln	Taos
Los Alamos	Torrance
Luna	Union
McKinley	Valencia
STATE OF OREGON	
Lake	

STATE OF UTAH

Beaver	Piute
Box Elder	Rich
CACHE	Salt Lake
Carbon	San Juan
Daggett	Sanpete
Davis	Sevier
Duchesne	Summit
Emery	Tooele
Grand	Uintah
Iron	Utah
Juab	Wasatch
Kane	Wayne
Millard	Weber
Morgan	

STATE OF WYOMING

Albany	Natrona
Carbon	Niobrara
Converse	Park
Fremont	Platte
Goshen	Sublette
Hot Springs	Sweetwater
Johnson	Teton
Laramie	Uinta
Lincoln	Weston

(D) A test vehicle selected under § 86.077-24(b) (1) (v) shall represent all vehicles of the same engine-system combination to be sold at high altitude.

(ii) *Gasoline-fueled heavy-duty engines.*

(A) A test engine selected under § 86.077-24(b) (2) (ii) and (iv) shall represent all engines in the same engine family of the same engine displacement-exhaust emission control system combination.

(B) A test engine selected under § 86.077-24(b) (2) (iii) shall represent all engines in the same engine family of the same engine displacement-exhaust emission control system combination.

(C) A test engine selected under § 86.077-24(c) (2) (i) shall represent all engines of the same engine-system combination.

(iii) *Diesel heavy-duty engines.*

(A) A test engine selected under § 86.077-24(b) (3) (ii) shall represent all engines in the same engine-system combination.

(B) A test engine selected under § 86.077-24(b) (3) (iii) shall represent all engines of that emission control system at the rated fuel delivery of the test engine.

(C) A test engine selected under § 86.077-24(c) (3) (i) shall represent all engines of the same engine-system combination.

(2) The Administrator will proceed as in paragraph (a) of this section with respect to the vehicles (or engines) belonging to an engine family all of which comply with applicable standards.

(3) If, after a review of the test reports and data submitted by the manufacturer, data derived from any additional testing conducted pursuant to § 86.077-29, data or information derived from any inspection carried out under § 86.077-7(c) or any other pertinent data or information, the Administrator determines that one or more test vehicles (or test engines) of the certification test fleet do not meet applicable standards, he will notify the manufacturer in writing, setting forth the basis for his determination. Within 30 days following receipt of the notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's determination and data in support of such objections. If, after a review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.077-6 with respect to such issue.

(4) The manufacturer may, at his option, proceed with any of the following alternatives with respect to any engine family represented by a test vehicle(s) (or test engine(s)) determined not in compliance with applicable standards.

(i) Request a hearing under § 86.077-6; or

(ii) Delete from the application for certification the vehicles (or engines) represented by the failing test vehicle

(or failing test engine). (Vehicles or engines so deleted may be included in a later request for certification under § 86.077-32.) The Administrator will then select in place of each failing vehicle (or failing engine) an alternate vehicle (or alternate engine) chosen in accordance with selection criteria employed in selecting the vehicle (or engine) that failed; or

(iii) Modify the test vehicle (or test engine) and demonstrate by testing that it meets applicable standards. Another vehicle (or engine) which is in all material respects the same as the first vehicle (or engine) as modified, shall then be operated and tested in accordance with applicable test procedures.

(5) If the manufacturer does not request a hearing or present the required data under paragraph (b) (4) of this section, the Administrator will deny certification.

(c) (1) Notwithstanding the fact that any certification vehicle(s) (or certification engine(s)) may comply with other provisions of this subpart, the Administrator may withhold or deny the issuance of a certificate of conformity (or suspend or revoke any such certificate which has been issued) with respect to any such vehicle(s) (or engine(s)) if:

(i) The manufacturer submits false or incomplete information in his application for certification thereof;

(ii) The manufacturer renders inaccurate any test data which he submits pertaining thereto.

(iii) Any EPA Enforcement Officer is denied access on the terms specified in § 86.077-7(c) to any facility or portion thereof which contains any of the following:

(A) The vehicle (or engine);

(B) Any components used or considered for use in its modification or build up into a certification vehicle (or certification engine);

(C) Any production vehicle (or production engine) which is or will be claimed by the manufacturer to be covered by the certificate;

(D) Any step in the construction of a vehicle (or engine) described in (C) of this subdivision;

(E) Any records, documents, reports, or histories required by this part to be kept concerning any of the above.

(iv) Any EPA Enforcement Officer is denied "reasonable assistance" (as defined in § 86.077-7(c)) in examining any of the items listed in paragraph (c) (1) (iii) of this section.

(2) The sanctions of withholding, denying, revoking, or suspending of a certificate may be imposed for the reasons in paragraphs (c) (1) (i), (ii), (iii), or (iv) of this section only when the infraction is substantial.

(3) In any case in which a manufacturer knowingly submits false or inaccurate information or knowingly renders inaccurate or invalid any test data or commits any other fraudulent acts and such acts contribute substantially to the Administrator's decision to issue a certificate of conformity, the Administrator may deem such certificate void ab initio.

(4) In any case in which certification of a vehicle (or engine) is proposed to

(6) The provisions of paragraph (a) (4) of this section shall not apply to any light-duty vehicle or light-duty truck, sold, offered for sale, introduced, or delivered for introduction into commerce in California, provided that the vehicle is covered by a certificate of conformity with emission standards in effect in California.

(7) Certificates issued for light-duty vehicles or light-duty trucks certified with catalytic converters shall be subject to the following term in addition to the term in paragraph (a) (2) of this section: "Catalyst-equipped vehicles, otherwise covered by this certificate, which are driven outside the United States, Canada, and Mexico will be presumed to have been operated on leaded gasoline resulting in deactivation of the catalysts. If these vehicles are imported or offered for importation without retrofit of the catalyst, they will be considered not to be within the coverage of this certificate unless included in a catalyst control program operated by a manufacturer or a United States Government Agency and approved by the Administrator."

(b) (1) The Administrator will determine whether a vehicle (or engine) covered by the application complies with applicable standards by observing the following relationships:

(i) *Light-duty vehicles and light-duty trucks.*

(A) A test vehicle selected under § 86.077-24(b) (1) (ii) or (iv) shall represent all vehicles in the same engine family of the same engine displacement-exhaust emission control system combination, as applicable, to be sold below 1219 meters (4,000 feet) in elevation.

(B) A test vehicle selected under § 86.077-24(b) (1) (iii) shall represent all vehicles in the same engine family of the same engine displacement-exhaust emission control system-transmission type-fuel system combination to be sold below 1219 meters (4,000 feet) in elevation.

(C) A test vehicle selected under § 86.077-24(c) (1) (i) shall represent all vehicles of the same engine-system combination.

be withheld, denied, revoked, or suspended under paragraph (c) (1) (iii), or (c) (1) (iv) of this section, and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.077-7(c) in fact occurred, the manufacturer, if he wishes to contend that, even though the violation occurred, the vehicle (or engine) in question was not involved in the violation to a degree that would warrant withholding denial, revocation, or suspension of certification under either paragraph (c) (1) (iii) or (c) (1) (iv) of this section, shall have the burden of establishing that contention to the satisfaction of the Administrator.

(5) Any revocation or suspension of certification under paragraph (c) (1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.077-6 hereof.

(ii) Extend no further than to forbid the introduction into commerce of vehicles (or engines) previously covered by certification which are still in the hands of the manufacturer, except in cases of such fraud or other misconduct as makes certification invalid ab initio.

(6) The manufacturer may request in the form and manner specified in paragraph (b) (3) of this section that any determination made by the Administrator under paragraph (c) (1) of this section to withhold or deny certification be reviewed in a hearing conducted in accordance with § 86.077-6. If the Administrator finds, after a review of the request and supporting data, that the request raises a substantial factual issue he will grant the request with respect to such issue.

(d) (1) *For light-duty vehicles and light-duty trucks.* Notwithstanding the fact that any vehicle configuration or engine family may be covered by a valid outstanding certificate of conformity, the Administrator may suspend such outstanding certificate of conformity in whole or in part with respect to such vehicle configuration or engine family if:

(i) The manufacturer refuses to comply with the provisions of a test order issued by the Administrator pursuant to § 86.603; or

(ii) The manufacturer refuses to comply with any of the requirements of § 86.603; or

(iii) The manufacturer submits false or incomplete information in any report or information provided pursuant to the requirements of § 86.609; or

(iv) The manufacturer renders inaccurate any test data which he submits pursuant to § 86.609; or

(v) Any EPA Enforcement Officer is denied access to a facility on the terms specified in § 86.606.

(vi) Any EPA Enforcement Officer is denied the opportunity on the terms specified in § 86.606 to

(A) Monitor vehicle selection pursuant to § 86.607,

(B) Select vehicles for testing pursuant to § 86.607, or

(C) Monitor vehicle testing performed to satisfy any of the requirements of this part; or

(vii) Any EPA Enforcement Officer is denied "reasonable assistance" as defined in § 86.606 in examining any of the items listed in that section; or

(viii) The manufacturer refuses to comply with the requirements of §§ 86.604(a), 86.605, 86.607, 86.608, 86.610, or 86.611.

(2) The sanction of suspending a certificate may not be imposed for the reasons in paragraphs (d) (1) (i), (ii) or (viii) of this section where such refusal is caused by conditions and circumstances outside the control of the manufacturer which renders it impossible to comply with those requirements. Such conditions and circumstances shall include, but are not limited to, any uncontrollable factors which result in the temporary unavailability of equipment and personnel needed to conduct the required tests, such as equipment breakdown or failure or illness of personnel, but shall not include failure of the manufacturer to adequately plan for and provide the equipment and personnel needed to conduct the tests. The manufacturer will bear the burden of establishing the presence of the conditions and circumstances required by this paragraph.

(3) The sanctions of suspending a certificate may be imposed for the reasons in paragraphs (d) (1) (iii), (iv), (v), (vi), (vii) of this section only when the infraction is substantial.

(4) In any case in which a manufacturer knowingly submitted false or inaccurate information or knowingly rendered inaccurate any test data or committed any other fraudulent acts, and such acts contributed substantially to the Administrator's original decision not to suspend or revoke a certificate of conformity in whole or in part, the Administrator may deem such certificate void from the date of such fraudulent act.

(5) In any case in which certification of a vehicle is proposed to be suspended under paragraph (d) (1) (v), (d) (1) (vi), or (d) (1) (vii) of this section, and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.606 in fact occurred, the manufacturer, if he wishes to contend that, even though the violation occurred, the vehicle configuration or engine family in question was not involved in the violation to a degree that would warrant suspension of certification under either paragraph (d) (1) (v), (d) (1) (vi), or (d) (1) (vii) of this section, shall have the burden of establishing that contention to the satisfaction of the Administrator.

(6) Any suspension of certification under paragraph (d) (1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.613 hereof and

(ii) Not apply to vehicles no longer in the hands of the manufacturer.

§ 86.077-31 Separate certification.

Where possible a manufacturer should include in a single application for certification all vehicles (or engines) for which certification is required. A manufacturer may, however, choose to apply separately for certification of part of his product line. The selection of test vehicles (or test engines) and the computation of test results will be determined separately for each application.

§ 86.077-32 Addition of a vehicle or engine after certification.

(a) If a manufacturer proposes to add to his product line a vehicle (or engine) of the same engine-system combination as vehicles (or engines) previously certified but which was not described in the application for certification when the test vehicle(s) (or test engine(s)) representing other vehicles (or engines) of that combination was certified, he shall notify the Administrator. Such notification shall be in advance of the addition unless the manufacturer elects to follow the procedure described in § 86.077-34. This notification shall include a full description of the vehicle (or engine) to be added.

(b) The Administrator may require the manufacturer to perform such tests on the test vehicle(s) (or test engine(s)) representing the vehicle (or engine) to be added which would have been required if the vehicle (or engine) had been included in the original application for certification.

(c) If, after a review of the test reports and data submitted by the manufacturer, and data derived from any testing conducted under § 86.077-29, the Administrator determines that the test vehicle(s) or test engine(s) meets all applicable standards, the appropriate certificate will be amended accordingly. If the Administrator determines that the test vehicle(s) (or test engine(s)) does not meet applicable standards, he will proceed under § 86.077-30(b).

§ 86.077-33 Changes to a vehicle or engine covered by certification.

(a) The manufacturer shall notify the Administrator of any change in production vehicles (or production engines) in respect to any of the parameters listed in § 86.077-24(a) (3), § 86.077-24(b) (1) (iii), § 86.077-24(b) (2) (iii), or § 86.077-24(b) (3) (iii) as applicable, giving a full description of the change. Such notification shall be in advance of the change unless the manufacturer elects to follow the procedure described in § 86.077-34.

(b) Based upon the description of the change, and data derived from such testing as the Administrator may require or conduct, the Administrator will determine whether the vehicle (or engine), as modified, would still be covered by the certificate of conformity then in effect.

(c) If the Administrator determines that the outstanding certificate would cover the modified vehicles (or engines) he will notify the manufacturer in writing. Except as provided in § 86.077-34, the change may not be put into effect prior to the manufacturer's receiving this noti-

fication. If the Administrator determines that the modified vehicles (or engines) would not be covered by the certificate then in effect, the modified vehicles (or engines) shall be treated as additions to the product line subject to § 86.077-32.

§ 86.077-34. Alternative procedure for notification of additions and changes.

(a) A manufacturer may, in lieu of notifying the Administrator in advance of an addition of a vehicle (or engine) under § 86.077-32 or a change in a vehicle (or engine) under § 86.077-33, notify him concurrently with the making of the change if the manufacturer believes the addition or change will not require any testing under the appropriate section. Upon notification to the Administrator, the manufacturer may proceed to put the addition or change into effect.

(b) The manufacturer may continue to produce vehicles (or engines) as described in the notification to the Administrator for a maximum of 30 days, unless the Administrator grants an extension in writing. This period may be shortened by a notification in accordance with paragraph (c) of this section.

(c) If the Administrator determines, based upon a description of the addition or change, that no test data will be required, he will notify the manufacturer in writing of the acceptability of the addition or change. If the Administrator determines that test data will be required, he will notify the manufacturer to rescind the change within 5 days of receipt of the notification. The Administrator will then proceed as in § 86.077-32 (b) and (c), or § 86.077-33 (b) and (c) as appropriate.

(d) Election to produce vehicles (or engines) under this section will be deemed to be a consent to recall all vehicles (or engines) which the Administrator determines under § 86.077-32(c) do not meet applicable standards, and to cause such nonconformity to be remedied at no expense to the owner.

§ 86.077-35 Labeling.

(a) The manufacturer of any motor vehicle (or motor vehicle engine) subject to the applicable emission standards of this subpart, shall at the time of manufacture, affix a permanent, legible label, of the type and in the manner described below, containing the information hereinafter provided, to all production models of such vehicles (or engines) available for sale to the public and covered by a certificate of conformity under § 86.077-30(a).

(1) *Light-duty vehicles and light-duty trucks.* (i) A legible, permanent label shall be affixed in a readily visible position in the engine compartment.

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle, in such a manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(iii) The label shall contain the following information lettered in the English language in block letters and num-

erals, which shall be of a color that contrasts with the background of the label:

(A) The label heading: Vehicle Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches) and engine family identification;

(D) Engine tuneup specifications and adjustments, as recommended by the manufacturer in accordance with the altitude at which the vehicle is to be sold to the ultimate purchaser, including but not limited to idle speed(s), ignition timing, the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), high idle speed, initial injection timing, and valve lash (as applicable) as well as other parameters deemed necessary by the manufacturer. These specifications should indicate the proper transmission position during tuneup and what accessories (e.g., air conditioner), if any, should be in operation;

(E) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations which apply to light-duty vehicles or light-duty trucks.

(F) The altitude at which the vehicle is intended for sale to the public as specified by a certificate of conformity under § 86.077-30.

(2) *Gasoline-fueled heavy-duty engines.* (i) A legible, permanent label shall be affixed to the engine in a position in which it will be readily visible after installation in the vehicle.

(ii) The label shall be attached to an engine part necessary for normal engine operation and not normally requiring replacement during engine life.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

(A) The label heading: Engine Exhaust Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches) and engine family identification;

(D) Date of engine manufacture (month and year);

(E) Engine tuneup specifications and adjustments as recommended by the manufacturer, including idle speed, ignition timing, and the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), and valve lash. These specifications should indicate the proper transmission position during tuneup and what accessories (e.g., air conditioner), if any, should be in operation;

(F) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations applicable to gasoline-fueled heavy-duty engines.

(iv) The label may be made up of one or more pieces provided that all pieces are permanently attached to the same engine part.

(3) *Diesel heavy-duty engines.* (i) A legible, permanent label shall be affixed

to the engine in a position in which it will be readily visible after installation in the vehicle.

(ii) The label shall be attached to an engine part necessary for normal engine operation and not normally requiring replacement during engine life.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

(A) The label heading: Engine Exhaust Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine family identification and model;

(D) Date of engine manufacture (month and year);

(E) Engine specification:

Advertised hp. at r.p.m.

Fuel rate at advertised hp. mm³/stroke.

Valve lash (inches).

Initial injection timing (if adjustable)
(The information applicable to each engine is to be inserted on the appropriate line.)

(F) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations applicable to Diesel heavy-duty engines.

(iv) The label may be made up of one or more pieces provided that all pieces are permanently attached to the same engine or vehicle part as applicable.

(b) The provisions of this section shall not prevent a manufacturer from also reciting on the label that such vehicle (or engine) conforms to any applicable state emission standards for new motor vehicles (or new motor vehicle engines) or any other information that such manufacturer deems necessary for, or useful to, the proper operation and satisfactory maintenance of the vehicle (or engine).

(c) (1) The manufacturer of any light-duty vehicle or light-duty truck subject to the emission standards of this subpart shall, in addition and subsequent to setting forth those statements on the label required by the Department of Transportation (DOT) pursuant to 49 CFR 567.4, set forth on the DOT label or on an additional label located in proximity to the DOT label and affixed as described in 49 CFR 567.4(b) the following information in the English language, lettered in block letters and numerals not less than three thirty-seconds of an inch high, of a color that contrasts with the background of the label:

(i) The Heading: "Vehicle Emission Control Information"

(ii) The Statement: "This Vehicle Conforms to U.S. EPA Regulations Applicable to 1977 Model Year New Motor Vehicles"

(iii) One of the following statements, as applicable, in letters and numerals not less than six thirty-seconds of an inch high and of a color that contrasts with the background of the label:

(A) For all vehicles certified as non-catalyst-equipped: "NON-CATALYST"

(B) For all vehicles certified as catalyst-equipped which are included in a manufacturer's catalyst control program

for which approval has been given by the Administrator: "CATALYST—APPROVED FOR IMPORT"

(C) For all vehicles certified as catalyst-equipped which are not included in a manufacturer's catalyst control program for which prior approval has been given by the Administrator: "CATALYST"

(2) In lieu of selecting either of the labeling options of paragraph (c) (1) of this section, the manufacturer may add the information required by paragraph (c) (1) (iii) of this section to the label required by paragraph (a) of this section. The required information will be set forth in the manner prescribed by paragraph (c) (1) (iii).

§ 86.077-36 Submission of vehicle identification numbers.

(a) The manufacturer of any light-duty vehicle or light-duty truck covered by a certificate of conformity under § 86.077-30(a) shall, not later than 60 days after its manufacture, submit to the Administrator the vehicle identification number of such vehicle: *Provided*, That this requirement shall not apply with respect to any vehicle manufactured within any State, as defined in section 302(d) of the Act.

(b) The requirements of this section may be waived with respect to any manufacturer who provides information satisfactory to the Administrator which will enable the Administrator to identify those vehicles which are covered by a certificate of conformity.

§ 86.077-37 Production vehicles and engines.

(a) Any manufacturer obtaining certification under this part shall supply to the Administrator, upon his request, a reasonable number of production vehicles (or engines) selected by the Administrator which are representative of the engines, emission control systems, fuel systems, and transmissions offered and typical of production models available for sale under the certificate. These vehicles (or engines) shall be supplied for testing at such time and place and for such reasonable periods as the Administrator may require. Heavy-duty engines supplied under this paragraph may be required to be mounted in chassis and appropriately equipped for operation on a chassis dynamometer.

(b) *Light-duty vehicles and light-duty trucks.*

(1) Any light-duty vehicle or light-duty truck manufacturer obtaining certification under this part shall notify the Administrator, on a quarterly basis, of the number of vehicles of each engine family-engine displacement-exhaust emission control system-fuel system-transmission type-inertia weight class combination produced for sale in the United States during the preceding quarter. A manufacturer may elect to provide this information every 60 days instead of quarterly, to combine it with the notification required under § 86.077-36.

(2) All light-duty vehicles and light-duty trucks covered by a certificate of conformity under § 86.077-30(a) shall be adjusted by the manufacturer to the ignition or injection timing specification detailed in § 86.077-35(a) (1) (iii) (D).

(c) *Heavy-duty engines.* Any heavy-duty engine manufacturer obtaining certification under this part shall notify the Administrator, on a quarterly basis, of the number of engines of each engine family-engine displacement-exhaust emission control system-fuel system combination produced for sale in the United States during the preceding quarter.

§ 86.077-38 Maintenance instructions.

(a) The manufacturer shall furnish or cause to be furnished to the purchaser of each new motor vehicle (or motor vehicle engine) subject to the standards prescribed in §§ 86.077-8 through 86.077-11 as applicable, written instructions for the maintenance and use of the vehicle (or engine) by the purchaser as may be reasonable and necessary to assure the proper functioning of emission control systems.

(1) Such instructions shall be provided for those vehicle and engine components listed in Appendix VI to this part (and for any other components) to the extent that maintenance of these components is necessary to assure the proper functioning of emission control systems.

(2) Such instructions shall be in clear, and to the extent practicable, nontechnical language.

(b) The maintenance instructions required by this section shall contain a general description of the documentation which the manufacturer will require from the ultimate purchaser or any subsequent purchaser as evidence of compliance with the instructions.

(c) For gasoline-fueled light-duty vehicles and light-duty trucks.

(1) Such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under §§ 86.077-25(a) (2) or 86.077-25 (b) (2) as applicable, and shall explain the conditions under which EGR system and catalytic converter maintenance is to be performed (e.g., what type of warning device is being employed and whether the device is activated by component failure or the need for periodic maintenance).

(2) Such instructions shall indicate, for vehicles to be sold to ultimate purchasers at low altitude, what adjustments or modifications, if any, are necessary to allow the vehicle to meet emissions standards at high altitude. The maintenance instructions shall, if applicable, include a statement that the vehicle's emission control system was not designed for conversion to allow the vehicle to meet emissions standards when operated at high altitude.

(3) Such instructions shall indicate, for vehicles to be sold to ultimate purchasers at high altitude, what adjustments or modifications, if any, are necessary to allow the vehicle to meet emissions standards at low altitude. The

maintenance instructions shall, if applicable, include a statement that the vehicle's emission control system was not designed for conversion to allow the vehicle to meet emissions standards when operated at low altitude.

(d) For Diesel light-duty vehicles and light-duty trucks.

(1) Such instructions shall indicate, for vehicles to be sold to ultimate purchasers at low altitude, what adjustments or modifications, if any, are necessary to allow the vehicle to meet emissions standards at high altitude. The maintenance instructions shall, if applicable, include a statement that the vehicle's emission control system was not designed for conversion to allow the vehicle to meet emissions standards when operated at high altitude.

(2) Such instructions shall indicate, for vehicles to be sold to ultimate purchasers at high altitude, what adjustments or modifications, if any, are necessary to allow the vehicle to meet emissions standards at low altitude. The maintenance instructions shall, if applicable, include a statement that the vehicle's emission control system was not designed for conversion to allow the vehicle to meet emissions standards when operated at low altitude.

(e) For gasoline-fueled heavy-duty engines, such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under § 86.077-25(c) (2). Scheduled maintenance in addition to that performed on the durability-data engine under § 86.077-25(d) (2) may be recommended for reasons such as to offset the effects of operating conditions which differ from the dynamometer durability cycle or to increase the life of the engine beyond 1500 hours (or the equivalent). The instructions may schedule maintenance on a calendar time basis and/or mileage basis in addition to the engine service time basis that was followed by the manufacturer under § 86.077-25(c) (2).

(f) For Diesel heavy-duty engines, such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under § 86.077-25(d) (2). Scheduled maintenance in addition to that performed on the durability-data engine under § 86.077-25(d) (2) may be recommended for reasons such as to offset the effects of operating conditions which differ from the dynamometer durability cycle or to increase the life of the engine beyond 1,000 hours (or the equivalent). The instructions may schedule maintenance on a calendar time basis, mileage basis, engine service time basis, or combinations of each.

§ 86.077-39 Submission of maintenance instructions.

(a) The manufacturer shall provide to the Administrator, no later than the time of the submission required by § 86.077-23, a copy of the maintenance instructions which the manufacturer proposes to supply to the ultimate purchaser in accordance with § 86.077-38(a). The Adminis-

trator will review such instructions to determine whether they are reasonable and necessary to assure the proper functioning of the vehicle's (or engine's) emission control systems. The Administrator will notify the manufacturer of his determination whether such instructions are reasonable and necessary to assure the proper functioning of the emission control systems.

(b) Any revision to the maintenance instructions which will affect emissions shall be supplied to the Administrator at least 30 days before being supplied to the ultimate purchaser unless the Administrator consents to a lesser period of time.

§ 86.078-1 General applicability.

(a) The provisions of this subpart apply to 1978 model year new gasoline-fueled and Diesel light-duty vehicles, 1978 model year new gasoline-fueled and Diesel light-duty trucks and 1978 model year new gasoline-fueled and Diesel heavy-duty engines.

(b) Optional applicability. A manufacturer may request to certify any heavy-duty vehicle 10,000 pounds GVWR or less as a light-duty truck; heavy-duty vehicle provisions do not apply to such a vehicle. Provisions applicable for the 1979 model year shall be followed with respect to such vehicles; however, the standards in § 86.078-9 shall apply. Any 1978 model year light-duty truck may be certified under the provisions applicable for the 1979 model year except that the standards in § 86.078-9 still apply.

§ 86.078-2 Definitions.

The following definitions apply beginning with the 1978 model year. Section 86.077-2 remains effective excepting those definitions which are hereby superseded.

"Accuracy" means the difference between a measurement and true value.

"Basic engine" means a unique combination of manufacturer, engine displacement, number of cylinders, fuel system (as distinguished by number of carburetor barrels or use of fuel injection), catalyst usage, and other engine and emission control system characteristics specified by the Administrator.

"Body type" means a name denoting a group of vehicles that are either in the same car line or in different car lines provided the only reason the vehicles qualify to be considered in different car lines is that they are produced by separate divisions of a single manufacturer.

"Calibration" means the set of specifications, including tolerances, unique to a particular design, version, or application of a component or components assembly capable of functionally describing its operation over its working range.

"Car line" means a name denoting a group of vehicles within a make or car division which has a degree of commonality in construction (e.g., body, chassis). Car line does not consider any level of decor or opulence and is not generally distinguished by characteristics as roof line, number of doors, seats or windows except for station wagons or light-duty trucks. Station wagons and light-duty

trucks are considered to be different car lines than passenger cars.

"Diurnal breathing losses" means evaporative emissions as a result of the daily range in temperature.

"Engine code" means a unique combination, within an engine-system combination, of displacement, carburetor (or fuel injection) calibration, choke calibration, distributor calibration, auxiliary emission control devices and other engine and emission control system components specified by the Administrator.

"Engine-system combination" means an engine family-exhaust emission control system combination.

"Evaporative emission code" means a unique combination in an evaporative emission family—evaporative emission control system combination, of purge system calibrations, fuel tank and carburetor bowl vent calibrations and other fuel system and evaporative emission control system components and calibrations specified by the Administrator.

"Evaporative emissions" means hydrocarbons emitted into the atmosphere from a motor vehicle, other than exhaust and crankcase emissions.

"Evaporative vehicle configuration" means a unique combination of basic engine, engine code, body type, and evaporative emission code.

"Fuel system" means the combination of fuel tank(s), fuel pump, fuel lines, and carburetor or fuel injection components, and includes all fuel system vents and fuel evaporative emission control system components.

"Hot-soak losses" means evaporative emissions after termination of engine operation.

"Malfunction" means not operating according to specifications (e.g., those specifications listed in the application for certification).

"Model type" means a unique combination of car line, basic engine, and transmission class.

"Nominal fuel tank capacity" means the volume of the fuel tank(s), specified by the manufacturer to the nearest tenth of a U.S. gallon, which may be filled with fuel from the fuel tank filler inlet.

"Precision" means the standard deviation of replicated measurements.

"Tank fuel volume" means the volume of fuel in the fuel tank(s), which is determined by taking the manufacturer's nominal fuel tank(s) capacity and multiplying by 0.40, the result being rounded using ASTM E 29-67 to the nearest tenth of a U.S. gallon.

"Transmission class" means the basic type of transmission, e.g., manual, automatic, semi-automatic.

"Transmission configuration" means a unique combination, within a transmission class, of the number of the forward gears and, if applicable, overdrive. The Administrator may further subdivide a transmission configuration (based on such criteria as gear ratios, torque converter multiplication ratio, stall speed and shift calibration, etc.), if he determines that significant fuel economy or exhaust emission differences exist within that transmission configuration.

"Vehicle configuration" means a unique combination of basic engine, engine code, inertia weight, transmission configuration, axle ratio.

"Zero (0) miles" means that point after initial engine starting (not to exceed 10 miles of vehicle operation, or one hour of engine operation) at which normal assembly line operations and adjustments are completed.

§ 86.078-3 Abbreviations.

(a) The abbreviations in this section apply to this subpart and also to Subparts B, H, I, and J and have the following meanings:

accel.—acceleration.
 AECOD—Auxiliary emission control device.
 API—American Petroleum Institute.
 ASTM—American Society for Testing and Materials.
 BHP—Brake horsepower.
 BSCO—Brake specific carbon monoxide.
 BSHC—Brake specific hydrocarbons.
 BSNO_x—Brake specific oxides of nitrogen.
 C—Celsius.
 cfh—cubic feet per hour.
 CFV—Critical flow venturi.
 CFV-CVS—Critical flow venturi—constant volume sampler.
 CL—Chemiluminescence.
 CO₂—carbon dioxide.
 CO—Carbon monoxide.
 conc.—concentration.
 cfm—cubic feet per minute.
 CT—Closed throttle.
 cu. in.—cubic inch(es).
 CVS—Constant volume sampler.
 decel.—deceleration.
 EP—End point.
 evap.—evaporative.
 F—Fahrenheit.
 FID—Flame ionization detector.
 FL—Full load.
 ft.—feet.
 g—gram(s).
 gal.—U.S. gallon(s).
 GVW—Gross vehicle weight.
 GVWR—Gross vehicle weight rating.
 h—hour(s).
 H₂O—water.
 HC—hydrocarbon(s).
 HFID—Heated flame ionization detector.
 Hg—mercury.
 hi—high.
 hp.—horsepower.
 IBP—Initial boiling point.
 ID—Internal diameter.
 in.—inch(es).
 K—kelvin.
 kg—kilogram(s).
 km—kilometer(s).
 kPa—kilopascal(s).
 lb.—pound(s).
 lb.-ft.—pound-feet.
 m—meter(s).
 max.—maximum.
 mg—milligram(s).
 mi.—mile(s).
 min.—minute(s).
 ml—milliliter(s).
 mm—millimeter(s).
 mph—miles per hour.
 mv—millivolt(s).
 N₂—nitrogen.
 NDIR—Nondispersive infrared.
 NO—nitric oxide.
 NO₂—nitrogen dioxide.
 NO_x—oxides of nitrogen.
 No.—Number.
 O₂—oxygen.
 Pb—lead.
 pct.—percent.
 PDP-CVS—Positive displacement pump—constant volume sampler.
 ppm—parts per million by volume.

ppm C—parts per million, carbon.
 psi—pounds per square inch.
 psig—pounds per square inch gauge.
 PTA—Part throttle acceleration.
 PTD—Part throttle deceleration.
 R—Rankin.
 rpm—revolutions per minute.
 RVP—Reid vapor pressure.
 s—second(s).
 SAE—Society of Automotive Engineers.
 SI—International system of units.
 sp.—speed.
 TEL—Tetraethyl lead.
 TML—Tetramethyl lead.
 UDDS—Urban dynamometer driving schedule.
 V—voit(s).
 vs—versus.
 W—watt(s).
 WF—Weighting factor.
 WOT—Wide open throttle.
 wt.—weight.
 '—feet.
 '—inch(es).
 °—degree(s).
 Σ—summation.

§ 86.078-4 Section numbering; construction.

(a) *Section numbering.* The model year of initial applicability is indicated by the last two digits of the 5 digit group. A section remains in effect for subsequent model years until it is superseded. The number following the hyphen designates what previous section is replaced by a future regulation.

EXAMPLES: Section 86.077-6 applies to the 1977 and subsequent model years until superseded. If a § 86.080-6 is promulgated it would take effect with the 1980 model year; § 86.077-6 would not apply after the 1979 model year. Section 86.077-10 would be replaced by § 86.078-10 beginning with the 1978 model year.

(b) *Construction.* Except where indicated, the language in this subpart applies to both vehicles and engines. In many instances language referring to engines is enclosed in parentheses and immediately follows the language discussing vehicles.

§ 86.078-5 General standards; increase in emissions; unsafe conditions.

(a) (1) Every new motor vehicle (or new motor vehicle engine) manufactured for sale, sold, offered for sale, introduced, or delivered for introduction into commerce, or imported into the United States for sale or resale which is subject to any of the standards prescribed in this subpart shall be covered by a certificate of conformity issued pursuant to §§ 86.078-21 through 86.078-23 and §§ 86.078-29 through 86.078-34.

(2) No heavy-duty vehicle manufacturer shall take any of the actions specified in section 203(a) (1) of the Act with respect to any gasoline-fueled or Diesel heavy-duty vehicle which uses an engine which has not been certified as meeting applicable standards. Each heavy-duty vehicle manufacturer shall provide to the Administrator prior to the beginning of each model year a statement signed by an authorized representative which includes the following information:

- (i) A description of the vehicles which will be produced subject to this section;
- (ii) Identification of the engines used in the vehicles;

(iii) Projected sales data on each vehicle-engine combination;

(iv) A statement that the engines will not be modified by the vehicle manufacturer or a detailed specification of any changes which will be made. Changes made solely for the purpose of mounting an engine in a vehicle need not be included.

(v) A statement that the engine maintenance instructions supplied by the engine manufacturer, in compliance with § 86.078-38, will be furnished to the ultimate purchaser. If these maintenance instructions are modified, a detailed description of the modifications and a justification for each must be provided to the Administrator for review. The Administrator will notify the manufacturer of the determination whether the modified instructions are reasonable and necessary to assure proper functioning of the emission control system.

(b) (1) Any system installed on or incorporated in a new motor vehicle (or new motor vehicle engine) to enable such vehicle (or engine) to conform to standards imposed by this subpart:

(i) Shall not in its operation or function cause the emission into the ambient air of any noxious or toxic substance that would not be emitted in the operation of such vehicle (or engine) without such system, except as specifically permitted by regulation; and

(ii) Shall not in its operation, function, or malfunction result in any unsafe condition endangering the motor vehicle, its occupants, or persons or property in close proximity to the vehicle.

(2) Every manufacturer of new motor vehicles (or new motor vehicle engines) subject to any of the standards imposed by this subpart shall, prior to taking any of the actions specified in section 203(a) (1) of the Act, test or cause to be tested motor vehicles (or motor vehicle engines) in accordance with good engineering practice to ascertain that such test vehicles (or test engines) will meet the requirements of this section for the useful life of the vehicle (or engine).

§ 86.078-6 Hearings on certification.

(a) (1) After granting a request for a hearing under §§ 86.078-22 or 86.078-30 the Administrator will designate a Presiding Officer for the hearing.

(2) The General Counsel will represent the Environmental Protection Agency in any hearing under this section.

(3) If a time and place for the hearing has not been fixed by the Administrator under §§ 86.078-22 or 86.078-30, the hearing shall be held as soon as practicable at a time and place fixed by the Administrator or by the Presiding Officer.

(4) In the case of any hearing requested pursuant to § 86.078-30(c) (5) (i), the Administrator may in his discretion direct that all argument and presentation of evidence be concluded within such fixed period not less than 30 days as he may establish from the date that the first written offer of a hearing is made to the manufacturer. To expedite proceedings, the Administrator may

direct that the decision of the Presiding Officer (who may, but need not be the Administrator himself) shall be the final EPA decision.

(b) (1) Upon his appointment pursuant to paragraph (a) of this section, the Presiding Officer will establish a hearing file. The file shall consist of the notice issued by the Administrator under §§ 86.078-22 or 86.078-30 together with any accompanying material, the request for a hearing and the supporting data submitted therewith, and all documents relating to the request for certification and all documents submitted therewith, and correspondence and other data material to the hearing.

(2) The hearing file will be available for inspection by the applicant at the office of the Presiding Officer.

(c) An applicant may appear in person, or may be represented by counsel or by any other duly authorized representative.

(d) (1) The Presiding Officer upon the request of any party, or in his discretion, may arrange for a prehearing conference at a time and place specified by him to consider the following:

- (i) Simplification of the issues;
- (ii) Stipulations, admissions of fact, and the introduction of documents;
- (iii) Limitation of the number of expert witnesses;
- (iv) Possibility of agreement disposing of all or any of the issues in dispute;
- (v) Such other matters as may aid in the disposition of the hearing, including such additional tests as may be agreed upon by the parties.

(2) The results of the conference shall be reduced to writing by the Presiding Officer and made part of the record.

(e) (1) Hearings shall be conducted by the Presiding Officer in an informal but orderly and expeditious manner. The parties may offer oral or written evidence, subject to the exclusion by the Presiding Officer of irrelevant, immaterial and repetitious evidence.

(2) Witnesses will not be required to testify under oath. However, the Presiding Officer shall call to the attention of witnesses that their statements may be subject to the provisions of title 18 U.S.C. 1001 which imposes penalties for knowingly making false statements or representations, or using false documents in any matter within the jurisdiction of any department or agency of the United States.

(3) Any witness may be examined or cross-examined by the Presiding Officer, the parties, or their representatives.

(4) Hearings shall be reported verbatim. Copies of transcripts of proceedings may be purchased by the applicant from the reporter.

(5) All written statements, charts, tabulations, and similar data offered in evidence at the hearings shall, upon a showing satisfactory to the Presiding Officer of their authenticity, relevancy, and materiality, be received in evidence and shall constitute a part of the record.

(6) Oral argument may be permitted in the discretion of the Presiding Officer.

cer and shall be reported as part of the record unless otherwise ordered by him.

(f) (1) The Presiding Officer shall make an initial decision which shall include written findings and conclusions and the reasons or basis therefor on all the material issues of fact, law, or discretion presented on the record. The findings, conclusions, and written decision shall be provided to the parties and made a part of the record. The initial decision shall become the decision of the Administrator without further proceedings unless there is an appeal to the Administrator or motion for review by the Administrator within 20 days of the date the initial decision was filed.

(2) On appeal from or review of the initial decision the Administrator shall have all the powers which he would have in making the initial decision including the discretion to require or allow briefs, oral argument, the taking of additional evidence or the remanding to the Presiding Officer for additional proceedings. The decision by the Administrator shall include written findings and conclusions and the reasons or basis therefor on all the material issues of fact, law, or discretion presented on the appeal or considered in the review.

§ 86.078-7 Maintenance of records; submittal of information; right of entry.

(a) The manufacturer of any new motor vehicle (or new motor vehicle engine) subject to any of the standards or procedures prescribed in this subpart shall establish, maintain and retain the following adequately organized and indexed records.

(1) *General records.* (i) The records required to be maintained by this paragraph shall consist of:

(A) Identification and description of all certification vehicles (or certification engines) for which testing is required under this subpart.

(B) A description of all emission control systems which are installed on or incorporated in each certification vehicle (or certification engine).

(C) A description of all procedures used to test each such certification vehicle (or certification engine).

(ii) A properly filed application for certification, following the format prescribed by the US EPA for the appropriate model year, fulfills each of the requirements of this paragraph (a)(1).

(2) *Individual records.* (i) A brief history of each motor vehicle (or motor vehicle engine) used for certification under this subpart in the form of a separate booklet or other document for each separate vehicle (or each separate engine) in which shall be recorded:

(A) In the case where a current production engine is modified for use in a certification vehicle (or as a certification engine), a description of the process by which the engine was selected and of the modifications made, giving specifically the place of modification and installation of the engine into the certification vehicle and the person(s) in charge of modification and installation, as appli-

cable. In the case where the engine for a certification vehicle (or certification engine) is not derived from a current production engine, a general description of the build up of the engine (e.g., experimental heads were cast and machined according to supplied drawings, etc.) giving specifically the place of engine assembly and installation into a certification vehicle and the person(s) in charge of engine assembly and installation, as applicable. In both cases above, a description of the origin and selection process for the carburetor, distributor, fuel system components, fuel injection components, emission control system components, smoke exhaust emission control system components, and exhaust aftertreatment devices as applicable, shall be included. The required descriptions shall specify the steps taken to assure that the certification vehicle (or certification engine) with respect to its engine, drive train, fuel system, emission control system components, exhaust aftertreatment devices, smoke exhaust emission control system components, vehicle weight or any other devices or components, as applicable, that can reasonably be expected to influence exhaust or evaporative emissions, as applicable, will be representative of production vehicles (or engines) and that either all components and/or vehicle (or engine) construction processes, component inspection and selection techniques, and assembly techniques employed in constructing such vehicles (or engines) are reasonably likely to be implemented for production vehicles (or engines) or that they are as closely analogous as practicable to planned construction and assembly processes.

(B) A complete record of all emission tests performed under Subparts B, H, I, and J, as applicable (except tests performed by EPA directly), including all individual worksheets and/or other documentation relating to each such test, or exact copies thereof, the date, time, purpose, and location of each test, the number of miles accumulated on the vehicle (or the number of hours accumulated on the engine), when the tests began and ended, and the names of supervisory personnel responsible for the conduct of the tests.

(C) The date and times of each mileage (or service) accumulation run, listing both the mileage (or number of operating hours) accumulated and the name of each driver or each operator of the automatic mileage accumulation device (or dynamometer operator).

(D) If used, the record of any devices employed to record the speed and/or mileage in relationship to time of the test vehicle (or engine RPM, and/or horsepower and/or torque in relationship to engine operating time).

(E) A record and description of all maintenance and other servicing performed, giving the date and time of the maintenance or service, the reason for it, the person authorizing it, and the names of supervisory personnel responsible for the conduct of the maintenance or service. The description shall indi-

cate whether or not EPA specifically consented to the work and, if EPA did not, shall list the provision of this part which authorizes its performance.

(F) A record and description of each test performed to diagnose engine or emissions control system performance, giving the date and time of the test, the reason for it, the person authorizing it, and the names of supervisory personnel responsible for the conduct of the test.

(G) The dates and times that the vehicle (or engine) was idle in storage, and in transit or transport.

(H) A brief description of any significant events affecting the vehicle (or engine) during any time in the period covered by the history not described by an entry under one of the previous headings including such extraordinary events as vehicle accidents (or accidents involving the engine) or driver speeding citations or warnings (or dynamometer runaway).

(i) Each such history shall be started on the date that the first of any of the selection or buildup activities in paragraph (a)(2)(i)(A) of this section occurred with respect to the certification vehicle (or engine), shall be updated each time the operational status of the vehicle (or engine) changes or additional work is done on it, and shall be kept in a designated location.

(3) All records required to be maintained under this subpart shall be retained by the manufacturer for a period of six (6) years after issuance of all certificates of conformity to which they relate. Records may be retained as hard copy or reduced to microfilm, punch cards, etc., depending on the record retention procedures of the manufacturer, *Provided*, That in every case all the information contained in the hard copy shall be retained.

(b) The manufacturer of any new motor vehicle (or new motor vehicle engine) subject to any of the standards prescribed in this subpart shall submit to the Administrator at the time of issuance by the manufacturer copies of all instructions or explanations regarding the use, repair, adjustment, maintenance, or testing of such vehicle (or engine) relevant to the control of crankcase, exhaust or evaporative emissions, as applicable, issued by the manufacturer for use by other manufacturers, assembly plants, distributors, dealers, and ultimate purchasers; *Provided*, That any material not translated into the English language need not be submitted unless specifically requested by the Administrator.

(c) (1) Any manufacturer who has applied for certification of a new motor vehicle (or new motor vehicle engine) subject to certification test under this subpart shall admit or cause to be admitted any EPA Enforcement Officer during operating hours on presentation of credentials to any of the following:

(i) Any facility where any such tests or any procedures or activities connected with such tests are or were performed.

(ii) Any facility where any new motor vehicle (or new motor vehicle engine)

which is being, was, or is to be tested is present.

(iii) Any facility where any construction process or assembly process used in the modification or build up of such a vehicle (or engine) into a certification vehicle (or certification engine) is taking place or has taken place.

(iv) Any facility where any record or other document relating to any of the above is located.

(2) Upon admission to any facility referred to in paragraph (c)(1) of this section, any EPA Enforcement Officer shall be allowed:

(i) To inspect and monitor any part or aspect of such procedures, activities, and testing facilities, including, but not limited to, monitoring vehicle (or engine) preconditioning, emissions tests and mileage (or service) accumulation, maintenance, and vehicle soak and storage procedures (or engine storage procedures), and to verify correlation or calibration of test equipment;

(ii) To inspect and make copies of any such records, designs, or other documents; and

(iii) To inspect and/or photograph any part or aspect of any such certification vehicle (or certification engine) and any components to be used in the construction thereof.

(3) In order to allow the Administrator to determine whether or not production motor vehicles (or production motor vehicle engines) conform in all material respects to the design specifications which applied to those vehicles (or engines) described in the application for certification for which a certificate of conformity has been issued to standards prescribed under section 202 of the Act, any manufacturer shall admit any EPA Enforcement Officer on presentation of credentials to both:

(i) Any facility where any document, design, or procedure relating to the translation of the design and construction of engines and emission related components described in the application for certification or used for certification testing into production vehicles (or production engines) is located or carried on; and

(ii) Any facility where any motor vehicles (or motor vehicle engines) to be introduced into commerce are manufactured or assembled.

(4) On admission to any such facility referred to in paragraph (c)(3) of this section, any EPA Enforcement Officer shall be allowed:

(i) To inspect and monitor any aspects of such manufacture or assembly and other procedures;

(ii) To inspect and make copies of any such records, documents or designs; and

(iii) To inspect and photograph any part or aspect of any such new motor vehicles (or new motor vehicle engines) and any component used in the assembly thereof that are reasonably related to the purpose of his entry.

(5) Any EPA Enforcement Officer shall be furnished by those in charge of a facility being inspected with such reasonable assistance as he may request

to help him discharge any function listed in this paragraph. Each applicant for or recipient of certification is required to cause those in charge of a facility operated for its benefit to furnish such reasonable assistance without charge to EPA whether or not the applicant controls the facility.

(6) The duty to admit or cause to be admitted any EPA Enforcement Officer applies whether or not the applicant owns or controls the facility in question and applies both to domestic and to foreign manufacturers and facilities. EPA will not attempt to make any inspections which it has been informed that local law forbids. However, if local law makes it impossible to do what is necessary to insure the accuracy of data generated at a facility, no informed judgment that a vehicle or engine is certifiable or is covered by a certificate can properly be based on those data. It is the responsibility of the manufacturer to locate its testing and manufacturing facilities in jurisdictions where this situation will not arise.

(7) For purposes of this paragraph:

(i) "Presentation of credentials" shall mean display of the document designating a person as an EPA Enforcement Officer.

(ii) Where vehicle, component, or engine storage areas or facilities are concerned, "operating hours" shall mean all times during which personnel other than custodial personnel are at work in the vicinity of the area or facility and have access to it.

(iii) Where facilities or areas other than those covered by paragraph (c)(7)

(ii) of this section are concerned, "operating hours" shall mean all times during which an assembly line is in operation or all times during which testing, maintenance, mileage (or service) accumulation, production or completion of records, or any other procedure or activity related to certification testing, to translation of designs from the test stage to the production stage, or to vehicle (or engine) manufacture or assembly is being carried out in a facility.

(iv) "Reasonable assistance" includes, but is not limited to, clerical, copying, interpretation and translation services, the making available on request of personnel of the facility being inspected during their working hours to inform the EPA Enforcement Officer of how the facility operates and to answer his questions, and the performance on request of emissions tests on any vehicle (or engine) which is being, has been, or will be used for certification testing. Such tests shall be nondestructive, but may require appropriate mileage (or service) accumulation. A manufacturer may be compelled to cause the personal appearance of any employee at such a facility before an EPA Enforcement Officer by written request for his appearance, signed by the Assistant Administrator for Enforcement, served on the manufacturer. Any such employee who has been instructed by the manufacturer to appear will be entitled to be accompanied, represented, and advised by counsel.

(v) Any entry without 24 hour prior written or oral notification to the affected manufacturer shall be authorized in writing by the Assistant Administrator for Enforcement.

§ 86.078-8 Emission standards for 1978 light-duty vehicles.

(a)(1) Exhaust emissions from 1978 and later model year light-duty vehicles shall not exceed:

(i) *Hydrocarbons*. 0.41 grams per vehicle mile.

(ii) *Carbon monoxide*. 3.4 grams per vehicle mile.

(iii) *Oxides of nitrogen*. 0.4 grams per vehicle mile.

(2) The standards set forth in paragraph (a)(1) of this section refer to the exhaust emitted over a driving schedule as set forth in Subpart B of this part and measured and calculated in accordance with those procedures.

(b)(1) Fuel evaporative emissions from 1978 and later model year gasoline-fueled light-duty vehicles shall not exceed:

(i) *Hydrocarbons*. 6.0 grams per test.

(2) The standard set forth in paragraph (b)(1) of this section refers to a composite sample of the fuel evaporative emissions collected under the conditions set forth in Subpart B of this part and measured in accordance with those procedures.

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any 1978 and later model year gasoline-fueled light-duty vehicle.

§ 86.078-9 Emission standards for 1978 light-duty trucks.

(a)(1) Exhaust emissions from 1978 model year light-duty trucks shall not exceed:

(i) *Hydrocarbons*. 2.0 grams per vehicle mile.

(ii) *Carbon monoxide*. 20 grams per vehicle mile.

(iii) *Oxides of nitrogen*. 3.1 grams per vehicle mile.

(2) The standards set forth in paragraph (a)(1) of this section refer to the exhaust emitted over a driving schedule as set forth in Subpart B and measured and calculated in accordance with those procedures.

(b)(1) Evaporative emissions from 1978 and later model year gasoline-fueled light-duty trucks shall not exceed:

(i) *Hydrocarbons*. 6.0 grams per test.

(2) The standard set forth in paragraph (b)(1) of this section refers to a composite sample of the evaporative emissions collected under the conditions set forth in Subpart B of this part and measured in accordance with those procedures.

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any 1978 and later model year gasoline-fueled light-duty truck.

§ 86.078-10 Emission standards for 1978 gasoline-fueled heavy-duty engines.

(a)(1) Exhaust emissions from new 1978 and later model year gasoline-fueled heavy-duty engines shall not exceed:

(i) *Hydrocarbons plus oxides of nitrogen (as NO_x)*. 16 grams per brake horsepower hour.

(ii) *Carbon monoxide*. 40 grams per brake horsepower hour.

(2) The standards set forth in paragraph (a)(1) of this section refer to composite samples representing the operating cycle set forth in Subpart H and measured in accordance with those procedures.

(b) [Reserved]

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any new 1978 and later model year gasoline-fueled heavy-duty engine.

(d) Every manufacturer of new motor vehicle engines subject to the standards prescribed in this subpart shall, prior to taking any of the actions specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicle engines in accordance with test procedures prescribed in Subpart H to ascertain that such test engines meet the requirements of paragraphs (a) and (c) of this section.

§ 86.078-11 Emission standards for 1978 Diesel heavy-duty engines.

(a)(1) The opacity of smoke emissions from new 1978 and later model year Diesel heavy-duty engines shall not exceed:

(i) 20 percent during the engine acceleration mode.

(ii) 15 percent during the engine lugging mode.

(iii) 50 percent during the peaks in either mode.

(2) The standards set forth in paragraph (a)(1) of this section refer to exhaust smoke emissions generated under the conditions set forth in Subpart I and measured and calculated in accordance with those procedures.

(b)(1) Exhaust gaseous emissions from new 1978 and later model year Diesel heavy-duty engines shall not exceed:

(i) *Hydrocarbons plus oxides of nitrogen (as NO_x)*. 16 grams per brake horsepower hour.

(ii) *Carbon monoxide*. 40 grams per brake horsepower hour.

(2) The standards set forth in paragraph (b)(1) of this section refer to exhaust gaseous emissions generated under the conditions set forth in Subpart J and measured and calculated in accordance with those procedures.

(c)-(d) [Reserved]

(e) Every manufacturer of new motor vehicle engines subject to the standards prescribed in this subpart shall, prior to taking any of the actions specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicle engines in accordance with test procedures prescribed in Subparts I and J to ascertain that such test engines meet the requirements of paragraphs (a) and (b) of this section.

§§ 86.078-12—86.078-20 [Reserved]

§ 86.078-21 Application for certification.

(a) A separate application for a certificate of conformity shall be made for each set of standards and each class of new motor vehicles or new motor vehicle

engines. Such application shall be made to the Administrator by the manufacturer and shall be updated and corrected by amendment.

(b) The application shall be in writing, signed by an authorized representative of the manufacturer, and shall include the following:

(1) Identification and description of the vehicles (or engines) covered by the application and a description of their engine (vehicles only), emission control system, and fuel system components. This shall include a detailed description of each AECD to be installed in or on any certification test vehicle (or certification test engine).

(2) Projected U.S. sales data sufficient to enable the Administrator to select a test fleet representative of the vehicles (or engines) for which certification is requested.

(3) A description of the test equipment and fuel proposed to be used.

(4)(i) A description of the proposed mileage (or service) accumulation procedures for durability testing.

(ii) A description of the test procedures to be used to establish the evaporative emission deterioration factors required to be determined and supplied in § 86.078-23(b)(2).

(5) A statement of recommended maintenance and procedures necessary to assure that the vehicles (or engines) covered by a certificate of conformity in operation conform to the regulations, and a description of the program for training of personnel for such maintenance, and the equipment required.

(6) At the option of the manufacturer, the proposed composition of the emission-data and durability-data test fleet.

(c) Complete copies of the application and of any amendments thereto, and all notifications under §§ 86.078-32, 86.078-33, and 86.078-34 shall be submitted in such multiple copies as the Administrator may require.

§ 86.078-22 Approval of application for certification; test fleet selections.

(a) After a review of the application for certification and any other information which the Administrator may require, the Administrator may approve the application and select a test fleet in accordance with § 86.078-24.

(b) The Administrator may disapprove in whole or in part an application for certification for reasons including incompleteness, inaccuracy, inappropriate proposed mileage (or service) accumulation procedures, test equipment, or fuel, and incorporation of defeat devices in vehicles (or on engines) described by the application.

(c) Where any part of an application is rejected, the Administrator shall notify the manufacturer in writing and set forth the reasons for such rejection. Within 30 days following receipt of such notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's deter-

minations, and data in support of such objections. If, after the review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078-6 with respect to such issue.

(d) The Administrator does not approve the test procedures for establishing the evaporative emission deterioration factors. The manufacturer shall submit the procedures as required in § 86.078-21(b)(4)(ii) prior to the Administrator's selection of the test fleet under § 86.078-24(b)(1) and if such procedures will involve testing of durability-data vehicles selected by the Administrator or elected by the manufacturer under § 86.078-24(c)(1), prior to initiation of such testing.

§ 86.078-23 Required data.

(a) The manufacturer shall perform the tests required by the applicable test procedures, and submit to the Administrator the following information: *Provided, however, That:*

(1) If requested by the manufacturer, the Administrator may waive any requirement of this section for testing of vehicles (or engines) for which emission data are available, or will be made available, under the provisions of § 86.078-29, or

(2) If requested by the manufacturer, the Administrator may waive any requirement of this section for testing of vehicles (or engines) at zero kilometers (or zero hours) of operation.

(b)(1) Exhaust emission durability data on such vehicles (or engines) tested in accordance with applicable test procedures and in such numbers as specified, which will show the performance of the systems installed on or incorporated in the vehicle (or engine) for extended mileage (or extended operation), as well as a record of all pertinent maintenance (all maintenance and servicing for Diesel heavy-duty engines) performed on the test vehicles (or test engines).

(2) Evaporative emission deterioration factors for each evaporative emission family—evaporative emission control system combination and all test data that are derived from testing described under § 86.078-21(b)(4)(ii) designed and conducted in accordance with good engineering practice to assure that the vehicles covered by a certificate issued under § 86.078-30 will meet the evaporative emission standards in § 86.078-8 or § 86.078-9, as appropriate, for the useful life of the vehicle.

(c) Emission data. (1) *Certification vehicles.* (i) Emission data on such vehicles tested in accordance with applicable test procedures and in such numbers as specified, which will show their emissions after zero kilometers (zero miles) and 6436 kilometers (4000 miles) of operation.

(ii) Emission data on those vehicles selected under §§ 86.078-24(b)(1)(v) and 86.078-24(b)(1)(vii) (D) and tested in accordance with the applicable test procedures of this subpart and in such

numbers as therein specified, which shall be tested at zero kilometers (zero miles) at any altitude, and under high-altitude conditions after 6436 kilometers (4000 miles) of operation at any altitude.

(2) *Certification engines.* Emission data on such engines tested in accordance with applicable emission test procedures and in such numbers as specified, which will show their emissions after zero hours and 125 hours of operation.

(d) A statement that the vehicles (or engines) for which certification is requested conform to the requirements in § 86.078-5(b) and that the descriptions of tests performed to ascertain compliance with the general standards in § 86.078-5(b) and the data derived from such tests are available to the Administrator upon request.

(e) (1) A statement that the test vehicles (or test engines) with respect to which data are submitted to demonstrate compliance with §§ 86.078-8, 86.078-9, 86.078-10, or § 86.078-11, as applicable, are in all material respects as described in the manufacturer's application for certification, have been tested in accordance with the applicable test procedures utilizing the fuels and equipment described in the application for certification and that on the basis of such tests the vehicles (or engines) conform to the requirements of the regulations in this part. If such statements cannot be made with respect to any vehicle (or engine) tested, the vehicle (or engine) shall be identified, and all pertinent data relating thereto shall be supplied to the Administrator. If, on the basis of the data supplied and any additional data as required by the Administrator, the Administrator determines that the test vehicle (or test engine) was not as described in the application for certification or was not tested in accordance with the applicable test procedures utilizing the fuels and equipment as described in the application for certification, the Administrator may make the determination that the vehicle (or engine) does not meet the applicable standards. The provisions of § 86.078-30(b) shall then be followed.

(2) For evaporative emission durability, the statement of compliance with paragraph (b) (2) of this section.

§ 86.078-24 Test vehicles and engines.

(a) (1) The vehicles or engines covered by an application for certification will be divided into groupings of engines which are expected to have similar emission characteristics throughout their useful life. Each group of engines with similar emission characteristics shall be defined as a separate engine family.

(2) To be classed in the same engine family, engines must be identical in all the following respects:

(i) The cylinder bore center-to-center dimensions.

(ii) The dimension from the centerline of the crankshaft to the centerline of the camshaft.

(iii) The dimension from the centerline of the crankshaft to the top of the cylinder block head face.

(iv) The cylinder block configuration (air cooled or water cooled; L-6, 90° V-8, etc.).

(v) The location of intake and exhaust valves and the valve sizes (within a 1/8-inch range on the valve head diameter).

(vi) The method of air aspiration.

(vii) The combustion cycle.

(viii) Catalytic converter characteristics; gasoline-fueled vehicles and engines only.

(ix) Thermal reactor characteristics; gasoline-fueled vehicles and engines only.

(3) Engines identical in all the respects listed in paragraph (a) (2) of this section may be further divided into different engine families if the Administrator determines that they may be expected to have different emission characteristics. This determination will be based upon a consideration of the following features of each engine:

(i) The bore and stroke.

(ii) The surface-to-volume ratio of the nominally dimensioned cylinder at the top dead center position.

(iii) The intake manifold induction port size and configuration.

(iv) The exhaust manifold port size and configuration.

(v) The intake and exhaust valve sizes.

(vi) The fuel system.

(vii) The camshaft timing and ignition or injection timing characteristics.

(4) Where engines are of a type which cannot be divided into engine families based upon the criteria listed in paragraphs (a) (2) and (3) of this section, the Administrator will establish families for those engines based upon the features most related to their emission characteristics.

(5) The gasoline-fueled vehicles covered by an application for certification will be divided into groupings which are expected to have similar evaporative emission characteristics throughout their useful life. Each group of vehicles with similar evaporative emission characteristics shall be defined as a separate evaporative emission family.

(6) To be classed in the same evaporative emission family, vehicles must be similar with respect to:

(i) Type of vapor storage device (e.g., canister, air cleaner, crankcase).

(ii) Canister design characteristics.

(iii) Fuel system characteristics.

(7) Where vehicles are of a type which cannot be divided into evaporative emission families based on the criteria listed above, the Administrator will establish families for those vehicles based upon the features most related to their evaporative emission characteristics.

(b) Emission data. (1) *Emission-data vehicles.* Paragraph (b) (1) of this section applies to light-duty vehicle and light-duty truck emission-data vehicles.

(i) Vehicles will be chosen to be operated and tested for emission data based upon the engine family groupings. Within each engine family, the requirements of this paragraph must be met.

(ii) Vehicles for each engine family will be divided into engine displacement-

exhaust emission control system combinations as applicable. A projected sales volume will be established for each combination for the model year for which certification is sought. One vehicle of each combination will be selected in order of decreasing projected sales volume until 70 percent of the projected sales of a manufacturer's total production of vehicles of that engine family is represented, or until a maximum of four vehicles is selected. If any single combination represents over 70 percent, then two vehicles of that combination may be selected. The vehicle selected for each combination will be specified by the Administrator as to such features as engine code, transmission type, fuel system, and inertia weight class.

(iii) The Administrator may select a maximum of four additional vehicles within each engine family based upon features indicating that they may have the highest emission levels of the vehicles in that engine family. In selecting these vehicles, the Administrator will consider such features as the emission control system combination, induction system characteristics, ignition system characteristics, fuel system, rated horsepower, rated torque, compression ratio, inertia weight class, transmission options, and axle ratio.

(iv) If the vehicles selected in accordance with paragraphs (b) (1) (ii) and (iii) of this section do not represent each engine-system combination, then one vehicle of each engine-system combination not represented will be selected by the Administrator. The vehicle selected shall be of the engine displacement with the largest projected sales volume of vehicles with the control system combination in the engine family and will be designated by the Administrator as to such features as engine code, transmission type, fuel system, and inertia weight class.

(v) The Administrator will also select one vehicle for each engine-system combination within an engine family for which vehicles are to be sold to ultimate purchasers at high altitude.

(vi) The Administrator may combine testing requirements for any vehicle selected under paragraph (b) (1) (v) or (b) (1) (vii) (D) of this section with the testing requirements for any similar vehicle in the same engine-system combination selected under paragraph (b) (1) (ii), (iii), or (iv) of this section or any similar vehicle in the same engine-system, evaporative emission family, evaporative emission control system combination selected under paragraph (b) (1) (vii) (A) or (B) of this section. The testing requirements may be combined by the Administrator by requiring a vehicle selected for testing under paragraphs (b) (1) (ii), (iii), (iv), (vii) (A), or (vii) (B) of this section to be modified (if necessary) after mileage accumulation and emission testing for the purpose of demonstrating compliance with § 86.078-23(c) (1) (ii).

(vii) (A) Vehicles of each evaporative emission family will be divided into evaporative emission control systems.

One vehicle of each evaporative emission control system within the evaporative emission family will be selected.

(B) The Administrator may select a maximum of four additional vehicles within each evaporative emission family based upon features indicating that they may have the highest evaporative emission levels of vehicles in that family.

(C) The Administrator may determine that the vehicles selected under paragraphs (b) (1) (ii) through (iv) of this section may be used to satisfy the requirements of paragraphs (b) (1) (vii) (A) and (B) of this section.

(D) The Administrator will also select one vehicle for each evaporative emission control system within each evaporative family for which vehicles are to be sold at high altitude.

(E) Vehicles selected under (b) (1) (v) may be used to satisfy the requirements of (b) (1) (vii) (D).

(2) *Gasoline-fueled heavy-duty emission-data engines.* Paragraph (b) (2) of this section applies to gasoline-fueled heavy-duty engines.

(i) Engines will be chosen to be run for emission data based upon engine family groupings. Within each engine family, the requirements of this paragraph must be met.

(ii) Engines of each engine family will be divided into engine displacement-exhaust emission control system combinations. A projected sales volume will be established for each combination for the applicable model year. One engine of each combination will be selected in order of decreasing projected sales volume until 70 percent of the projected sales of a manufacturer's total production of engines of that family is represented, or until a maximum of four engines is selected. The engines selected for each combination will be specified by the Administrator as to fuel system.

(iii) The Administrator may select a maximum of two additional engines within each engine family based upon features indicating that they may have the highest emission levels of the engines in that engine family. In selecting these engines, the Administrator will consider such features as the exhaust emission control system, induction system characteristics, ignition system characteristics, fuel system, rated horsepower, rated torque, and compression ratio.

(iv) If the engines selected in accordance with paragraphs (b) (2) (ii) and (iii) of this section do not represent each engine displacement-exhaust emission control system combination, then one engine of each engine displacement-exhaust emission control system combination not represented shall be selected by the Administrator.

(3) *Diesel heavy-duty emission-data engines.* Paragraph (b) (3) of this section applies to Diesel heavy-duty emission-data engines.

(i) Engines will be chosen to be run for emission data based upon engine family groupings. Within each engine family, the requirements of this paragraph must be met.

(ii) Engines of each engine family will be divided into groups based upon

exhaust emission control system. One engine of each engine-system combination shall be run for smoke emission data and gaseous emission data as prescribed in § 86.078-26(c) (3). Either the complete gaseous emission test or the complete smoke test may be conducted first. Within each combination, the engine that features the highest fuel feed per stroke, primarily at the speed of maximum rated torque and secondarily at rated speed, will usually be selected. If there are military engines with higher fuel rates than other engines in the same engine-system combination, then one military engine shall also be selected. The engine with the highest fuel feed per stroke will usually be selected.

(iii) The Administrator may select a maximum of one additional engine within each engine-system combination based upon features indicating that it may have the highest emission levels of the engines of that combination. In selecting this engine, the Administrator will consider such features as the injection system, fuel system, compression ratio, rated speed, rated horsepower, peak torque speed, and peak torque.

(c) *Durability data.* (1) *Durability-data vehicles.* Paragraph (c) (1) of this section applies to light-duty vehicle and light-duty truck durability-data vehicles.

(i) A durability-data vehicle will be selected by the Administrator to represent each engine-system combination. The vehicle selected shall be of the engine displacement with the largest projected sales volume of vehicles with that control-system combination in that engine family and will be designated by the Administrator as to transmission type, fuel system, and inertia weight class.

(ii) A manufacturer may elect to operate and test additional vehicles to represent any engine-system combination. The additional vehicles must be of the same engine displacement, transmission type, fuel system, and inertia weight class as the vehicle selected for that engine-system combination in accordance with the provisions of paragraph (c) (1) (i) of this section. Notice of an intent to operate and test additional vehicles shall be given to the Administrator not later than 30 days following notification of the test fleet selection.

(2) *Gasoline-fueled heavy-duty durability-data engines.* Paragraph (c) (2) of this section applies to gasoline-fueled heavy-duty durability-data engines.

(i) A durability-data engine will be selected by the Administrator to represent each engine-system combination. The engine selected shall be of the displacement with the largest projected sales volume of engines with that exhaust emission control system in that engine family and will be designated by the Administrator as to fuel system.

(ii) [Reserved.]

(iii) A manufacturer may elect to operate and test additional engines to represent any engine-system combination. The additional engines must be of the same engine displacement and fuel system as the engine selected for that combination in accordance with the pro-

visions of paragraph (c) (2) (i) of this section. Notice of an intent to run additional engines shall be given to the Administrator not later than 30 days following notification of the test fleet selection. Deterioration factors calculated for each engine-system combination shall be applied separately to military and nonmilitary engines within the same engine-system combination.

(3) *Diesel heavy-duty durability-data engines.* Paragraph (c) (3) of this section applies to Diesel heavy-duty durability-data engines.

(i) One engine from each engine-system combination shall be tested as prescribed in § 86.078-26(c) (3) (ii). At each test point, either the complete gaseous emission test or the complete smoke test may be conducted first. Within each combination, the engine which features the highest fuel feed per stroke, primarily at rated speed and secondarily at the speed of maximum rated torque, will usually be selected for durability testing. In the case where more than one engine in an engine-system combination has the highest fuel feed per stroke, the engine with the highest maximum rated horsepower will usually be selected for durability testing. If an engine-system combination includes both military and nonmilitary engines, then the nonmilitary engine with the highest maximum rated horsepower will usually be selected for durability testing.

(ii) A manufacturer may elect to operate and test additional engines to represent any engine-system combination. The additional engines must be of the same model and fuel system as the engine selected in accordance with the provisions of paragraph (c) (3) (i) of this section. Notice of an intent to test additional engines shall be given to the Administrator not later than 30 days following notification of the test fleet selection. Deterioration factors calculated for each engine-system combination shall be applied separately to military and nonmilitary engines within the same engine-system combination.

(d) For purposes of testing under § 86.078-26 (a) (9), (b) (9) or (c) (11), the Administrator may require additional emission-data vehicles (or emission-data engines) and durability-data vehicles (or durability-data engines) identical in all material respects to vehicles (or engines) selected in accordance with paragraphs (b) and (c) of this section: *Provided*, That the number of vehicles selected shall not increase the size of either the emission-data fleet or the durability-data fleet by more than 20 percent or one vehicle, whichever is greater.

(e) Any manufacturer whose projected sales for the model year in which certification is sought is less than

- (1) 2000 gasoline-fueled light-duty vehicles, or
- (2) 2000 Diesel light-duty vehicles, or
- (3) 2000 gasoline-fueled light-duty trucks, or
- (4) 2000 Diesel light-duty trucks, or
- (5) 700 gasoline-fueled heavy-duty engines, or

(6) 200 Diesel heavy-duty engines, may request a reduction in the number of test vehicles (or engines) determined in accordance with the foregoing provisions of this section. The Administrator may agree to such lesser number as he determines would meet the objectives of this procedure.

(f) In lieu of testing an emission-data or durability-data vehicle (or engine) selected under paragraph (b) or (c) of this section, and submitting data therefor, a manufacturer may, with the prior written approval of the Administrator, submit exhaust emission data and/or fuel evaporative emission data, as applicable on a similar vehicle (or engine) for which certification has previously been obtained or for which all applicable data required under § 86.078-23 has previously been submitted.

(g) (1) This paragraph applies to light-duty vehicles and light-duty trucks.

(2) Where it is expected that more than 33 percent of the vehicles in an engine family will be equipped with an optional item, the full estimated weight of that item shall be included, if required by the Administrator, in the curb weight computation for each vehicle available with that option in the engine family. Where it is expected that 33 percent or less of the vehicles in an engine family will be equipped with an item of optional equipment, no weight for that item will be added in computing curb weight. In the case of mutually exclusive options, only the weight of the heavier option will be added in computing curb weight. Optional equipment weighing less than 3 pounds per item need not be considered.

(3) Where it is expected that more than 33 percent of the vehicles in an engine family will be equipped with an item of optional equipment that can reasonably be expected to influence emissions, then such items of optional equipment shall actually be installed, unless specifically excluded by the Administrator, on all emission-data and durability-data vehicles in the engine family on which the option is intended to be offered in production. Optional equipment that can reasonably be expected to influence emissions are the air conditioner, power steering, power brakes and other items determined by the Administrator.

(4) Optional equipment that can reasonably be expected to influence emissions which is utilized on 33 percent or less of the vehicles in the engine family shall not be installed on any vehicle in that engine family unless specifically required under this section.

§ 86.078-25 Maintenance.

(a) *Light-duty vehicles and light-duty trucks.* Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(1) Scheduled maintenance on the engine, emission control system, and fuel system of durability-data vehicles, selected by the Administrator or elected by the manufacturer under § 86.078-24 (c) (1), shall be scheduled for perform-

ance during durability testing at the same mileage intervals that will be specified in the manufacturer's maintenance instructions furnished to the ultimate purchaser of the motor vehicle. Such maintenance shall be performed, except as provided in paragraph (a) (5) (iii) of this section, only under the following provisions:

(i) Scheduled major engine tuneups to manufacturer's specifications may be performed no more frequently than every 12,500 miles of scheduled driving, provided that no tuneup may be performed after 45,000 miles of scheduled driving. A scheduled major engine tuneup shall be restricted to paragraph (a) (1) (i) (A) or (B) of this section, as applicable, and shall be conducted in a manner consistent with service instructions and specifications provided by the manufacturer for use by customer service personnel.

(A) For gasoline-fueled vehicles, the following items may be inspected, replaced, cleaned, adjusted, and/or serviced as required:

- (1) Ignition system.
- (2) Cold starting enrichment systems (includes fast idle speed setting).
- (3) Curb idle speed and air/fuel mixture.
- (4) Drive belt tension on engine accessories.
- (5) Valve lash.
- (6) Inlet air and exhaust gas control valves.
- (7) Engine bolt torque.
- (8) Spark plugs.
- (9) Fuel filter and air filter.
- (10) Crankcase emission control system.

(ii) Fuel evaporative emission control system.

(B) For Diesel vehicles, a major engine tuneup shall be restricted to the following:

- (1) Adjust low idle speed.
- (2) Adjust valve lash if required.
- (3) Adjust injector timing.
- (4) Adjust governor.
- (5) Clean and service injector tips.
- (6) Adjust drive belt tension on engine accessories.
- (7) Check engine bolt torque and tighten as required.

(ii) Change of engine and transmission oil, and change or service of oil filter will be allowed at the same mileage intervals that will be specified in the manufacturer's maintenance instructions.

(iii) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to adjustment during scheduled major engine tuneups, once during the first 5,000 miles of vehicle operation.

(2) (i) For gasoline-fueled vehicles, unscheduled maintenance on the engine, emission control system and fuel system of durability-data vehicles may be performed, except as provided in paragraph (a) (5) (i) of this section, only under the following provisions:

(A) Any persistently misfiring spark plug may be replaced in addition to replacement at scheduled major engine tuneup points.

(B) Readjustment of the engine cold starting enrichment system may be performed if there is a problem of stalling or if there is visible black smoke.

(C) Readjustment of the engine idle speed (curb idle and fast idle) may be performed in addition to that performed as scheduled maintenance under paragraph (a) (1) of this section if the idle speed exceeds the manufacturer's recommended idle speed by 300 r.p.m. or more, or if there is a problem of stalling.

(D) The idle mixture may be reset other than during scheduled major engine tuneups, only with the advance approval of the Administrator.

(ii) For Diesel vehicles, unscheduled maintenance on the engine, emission control system and fuel system of durability-data vehicles may be performed, except as provided in paragraph (a) (5) (i) of this section, only under the following provisions:

(A) Injectors may be changed if a persistent misfire is detected.

(B) Readjustment of the engine idle speed (curb idle and fast idle) may be performed in addition to that performed as scheduled maintenance under paragraph (a) (1) of this section, if the idle speed exceeds the manufacturer's recommended idle speed by 300 r.p.m. or more, or if there is a problem of stalling.

(3) An exhaust gas recirculation (EGR) system may be serviced during durability testing only under one of the following provisions:

(i) Manufacturers may schedule service to the EGR system at the scheduled major engine tuneups if an audible and/or visual signal approved by the Administrator alerts the vehicle operator to the need for EGR system maintenance at each of those mileage points. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of vehicles in use.

(ii) Manufacturers may service the EGR system as unscheduled maintenance a maximum of three times during the 50,000 miles if failure of the EGR system activates an audible and/or visual signal approved by the Administrator which alerts the vehicle operator to the need for EGR system maintenance. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of vehicles in use.

(iii) Manufacturers may service the EGR system a maximum of three times during the 50,000 miles either at a scheduled major engine tune-up point or as unscheduled maintenance, if an audible and/or visual signal approved by the Administrator alerts the vehicle operator to the need for EGR system maintenance. The signal may be activated either by EGR system failure (unscheduled maintenance) or need for scheduled periodic maintenance. If maintenance is performed, the signal for scheduled periodic maintenance shall be reset. One additional servicing may also be performed

as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of the vehicles in use.

(iv) Manufacturers may schedule service to the EGR system at the scheduled major engine tuneup(s) if failure to perform EGR system maintenance is not likely, as determined by the Administrator, to result in an improvement in vehicle performance. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of vehicles in use.

(4) The catalytic converter may be serviced once during 50,000 miles if an audible and/or visual signal approved by the Administrator alerts the vehicle operator to the need for maintenance. The signal may be activated either by component failure or need for maintenance at a scheduled point.

(5) Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on durability-data vehicles shall be performed only with the advance approval of the Administrator.

(f) In the case of unscheduled maintenance, such approval will be given if the Administrator:

(A) Has made preliminary determination that part failure or system malfunction, or the repair of such failure or malfunction, does not render the vehicle unrepresentative of vehicles in use, and does not require direct access to the combustion chamber, except for spark plug, fuel injection component, or removable pre-chamber removal or replacement (as applicable); and

(B) Has made a determination that the need for maintenance or repairs is indicated by an overt indication of malfunction such as persistent misfiring, vehicle stalling, overheating, fluid leakage, loss of oil pressure, or charge indicator warning. For the evaporative emission control system, this overt indication may be indicated by such items as fuel odor or fluid leakage.

(ii) Emission measurements may not be used as a means of determining the need for unscheduled maintenance under paragraph (a) (5) (i) (A) of this section.

(iii) Requests for authorization of scheduled maintenance of emission control-related components not specifically authorized to be maintained by these regulations must be made prior to the beginning of durability testing. The Administrator will approve the performance of such maintenance if the manufacturer makes a satisfactory showing that the maintenance will be performed on vehicles in use.

(6) If the Administrator determines that part failure or system malfunction occurrence and/or repair rendered the vehicle unrepresentative of vehicles in use, the vehicle shall not be used as a durability-data vehicle.

(7) Where the Administrator agrees under § 86.078-26 to a mileage accumulation of less than 50,000 miles for dura-

bility testing, he may modify the requirements of this paragraph.

(8) (i) Adjustment of engine idle speed on emission-data vehicles may be performed once before the 6436-kilometer (4000-mile) test point. Any other engine, emission control system or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on emission-data vehicles shall be performed only with the advance approval of the Administrator.

(ii) Maintenance on emission-data vehicles selected under § 86.078-24 (b) (1) (v) or (b) (1) (vii) (D) and permitted to be tested for purposes of § 86.078-23(c) (1) (ii) under the provisions of § 86.078-24(b) (1) (vi) may be performed in conjunction with emission control system modifications at the 6436-kilometer (4000-mile) test point, and shall be performed in accordance with the maintenance instructions to be provided to the ultimate purchaser required under § 86.078-38.

(iii) Maintenance on those emission-data vehicles selected under § 86.078-24 (b) (1) (v) which are not capable of being modified in the field for the purpose of complying with emission standards at an altitude other than intended by the original design may be performed in conjunction with the emission control system modifications at the 6436-kilometer (4000-mile) test point and shall be approved in advance by the Administrator.

(9) Repairs to vehicle components of the durability-data or emission-data vehicle other than the engine, emission control system, or fuel system, shall be performed only as a result of part failure, vehicle system malfunction, or with the advance approval of the Administrator.

(10) Complete emission tests (see §§ 86.106 through 86.145) are required, unless waived by the Administrator, before and after any vehicle maintenance which may reasonably be expected to affect emissions. These test data shall be air posted to the Administrator within 24 hours (or delivered within 3 working days) after the test along with a complete record of all pertinent maintenance including a preliminary engineering report of any malfunction diagnosis and corrective action taken. A complete engineering report shall be delivered or air posted to the Administrator within 10 working days after the tests. In addition, all test data and maintenance reports shall be compiled and provided to the Administrator in accordance with § 86.078-23.

(11) The Administrator shall be given the opportunity to verify the existence of an overt indication of part failure and/or vehicle malfunction (e.g., misfiring, stalling, and/or black smoke), or an activation of an audible and/or visual signal, prior to the performance of any maintenance to which such overt indication or signal is relevant under the provisions of this section.

(12) Equipment, instruments, or tools may not be used to identify malfunctioning, maladjusted, or defective engine components unless the same or equivalent

equipment, instruments, or tools will be available to dealerships and other service outlets, and:

(i) Are used in conjunction with scheduled maintenance on such components.

(ii) Are used subsequent to the identification of a vehicle or engine malfunction, as provided in paragraph (a) (5) (i) of this section for durability-data vehicles or paragraph (a) (8) (i) of this section for emission-data vehicles, or

(iii) Unless specifically authorized by the Administrator.

(b) [Reserved]

(c) (1) *Gasoline-fueled heavy-duty engines.* Paragraph (c) of this section applies to gasoline-fueled heavy-duty engines.

(2) (i) Scheduled maintenance may be performed on durability-data engines only under the following provisions:

(A) Major engine tuneups to manufacturer's specifications may be performed no more frequently than every 375 hours of scheduled dynamometer operation: *Provided*, No tuneups are performed after 1375 hours of scheduled dynamometer operation. The maintenance to be performed on the durability-data engines shall be requested in the application for certification and shall be specified at the same intervals in the maintenance instructions which will be furnished to the ultimate purchaser of the vehicle in which the engine, which is represented by the test engine, is installed. (For equivalent dynamometer hours, engine hours, and mileage intervals, see § 86.078-2. A scheduled major engine tuneup shall be restricted to paragraphs (c) (2) (i) (A) (1) through (12) of this section and shall be conducted in a manner consistent with service instructions and specifications provided by the manufacturer for use by the customer service personnel. The following items may be inspected, replaced, cleaned, adjusted, and/or serviced as required:

(1) Ignition system.

(2) Cold starting enrichment system (includes fast idle speed setting).

(3) Curb idle speed and air/fuel mixture.

(4) Drive belt tension on engine accessories.

(5) Valve lash.

(6) Inlet air and exhaust gas control valves.

(7) Engine bolt torque.

(8) Spark plugs.

(9) Fuel filter and air filter.

(10) Crankcase emission control system.

(11) Fuel evaporative emission control system.

(12) Exhaust gas recirculation system.

(B) Change of engine oil, and change or service of oil filter will be allowed at the equivalent intervals that will be specified in the manufacturer's maintenance instructions.

(C) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to during scheduled major engine tuneups, once during the first 125 hours of engine operation.

(ii) Unscheduled maintenance may be performed on durability-data engines, except as provided in paragraph (c) (v) (A) of this section, only under the following provisions:

(A) Any persistently misfiring spark plug may be replaced in addition to replacement at scheduled major engine tuneup points.

(B) Readjustment of the engine cold starting enrichment system may be performed if there is a problem of stalling or if there is visible black smoke.

(C) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to that performed as scheduled maintenance under paragraph (c) (2) (i) of this section, if the idle speed exceeds the manufacturer's recommended idle speed by 300 r.p.m. or more, or if there is a problem of stalling.

(D) The idle mixture may be reset, other than during scheduled major engine tuneups, only with the advance approval of the Administrator.

(iii)-(iv) [Reserved]

(v) Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on durability-data engines shall be performed only with the advance approval of the Administrator.

(A) In the case of unscheduled maintenance such approval will be given if the Administrator:

(1) Has made a preliminary determination that part failure or system malfunction, or the repair of such failure or malfunction, does not render the engine unrepresentative of engines in use, and does not require direct access to the combustion chamber, except for spark plug, fuel injection component, or removable prechamber removal or replacement; and

(2) Has made a determination that the need for maintenance or repairs is indicated by an overt indication of malfunction such as persistent misfiring, engine stalling, overheating, fluid leakage, loss of oil pressure, excessive fuel consumption or excessive power loss.

(B) Emission measurements may not be used as a means of determining the need for unscheduled maintenance under paragraph (c) (2) (v) (A) (1) of this section.

(C) Requests for authorization of scheduled maintenance of emission control-related components not specifically authorized to be maintained by these regulations must be made prior to the beginning of durability testing. The Administrator will approve the performance of such maintenance if the manufacturer makes a satisfactory showing that the maintenance will be performed on engines in use.

(vi) If the Administrator determines that part failure or system malfunction occurrence and/or repair rendered the engine unrepresentative of engines in use, the engine shall not be used as a durability-data engine.

(3) (i) Scheduled maintenance on emission-data engines is limited to the adjustment of idle speed once before the 125-hour test point: *Provided*, The idle

speed is outside the manufacturer's specifications to be shown on the engine label (see § 86.078-35(a) (2) (iii)).

(ii) Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement shall be performed only with the advance approval of the Administrator.

(4) [Reserved]

(5) (i) Complete emission tests (see § 86.777-5 through 86.777-15) are required unless waived by the Administrator, before and after:

(A) Scheduled maintenance approved for durability-data engines.

(B) Unscheduled maintenance which may reasonably be expected to affect emissions.

(ii) The tests before and after scheduled maintenance, which are performed on durability-data engines prior to 117 hours, are waived. The test before scheduled maintenance, which is performed on durability-data engines after 117 hours and prior to 133 hours, is waived. The after-maintenance test must be run and the results used in the deterioration factor calculation in accordance with § 86.078-28(b) (4) (i) (A) (2).

(iii) The idle speed reset and any scheduled maintenance on the emission-data engine shall be performed prior to the 125-hour test. The before-maintenance and after-maintenance tests associated with idle speed reset and scheduled maintenance on the emission-data engine are waived.

(iv) Test data required by this paragraph shall be air posted to the Administrator within 72 hours (or delivered within 5 working days), along with a complete record of all pertinent maintenance.

(v) When unscheduled maintenance is approved, a preliminary engineering report, unless waived by the Administrator, shall be air posted within 72 hours (or delivered within 5 working days). A final engineering report shall be delivered or air posted within 10 working days after the completion of the emission tests. The Administrator may approve an extension of the time requirements for the final engineering report.

(vi) All test data, maintenance reports, and required engineering reports shall be compiled and provided to the Administrator in accordance with § 86.078-23.

(6) The Administrator shall be given the opportunity to verify the existence of an overt indication of part failure and/or engine malfunction (e.g., misfiring, stalling).

(7) Equipment, instruments, or tools may not be used to identify malfunctioning, maladjusted, or defective engine components unless the same or equivalent equipment, instruments, or tools will be available to dealerships and other service outlets, and

(i) Are used in conjunction with scheduled maintenance on such components;

(ii) Are used subsequent to the identification of an engine failure or mal-

function, as provided in paragraph (c) (2) (v) (A) of this section for durability-data engines or paragraph (c) (3) of this section for emission-data engines; or

(iii) Unless specifically authorized by the Administrator.

(d) (1) *Diesel heavy-duty engines.* Paragraph (d) of this section applies to Diesel heavy-duty engines.

(2) (i) Scheduled maintenance may be performed on durability-data engines only under the following provisions:

(A) One major engine servicing to manufacturer's specifications may be performed prior to 875 hours (± 8 hours) of scheduled dynamometer operation provided such maintenance is requested in the application for certification and is specified in the maintenance instructions which will be furnished to the ultimate purchaser of the motor vehicle in which the engine, which is represented by the test engine, is installed. (For equivalent dynamometer hours, engine hours, and mileage intervals, see § 86.078-2.) A scheduled major servicing shall be restricted to paragraphs (d) (2) (i) (A) (1) through (7) of this section and shall be conducted in a manner consistent with service instructions and specifications provided by the manufacturer for use by customer service personnel. The following items may be inspected, replaced, cleaned, adjusted, and/or serviced as required:

- (1) Low idle speed.
- (2) Drive belt tension.
- (3) Engine bolt torque.
- (4) Valve lash.
- (5) Injection timing.
- (6) Injector assemblies.
- (7) Governor settings.

(B) Normal engine servicing such as engine oil change, and oil filter, fuel filter, and air filter cleaning or replacement will be allowed at the manufacturer's recommended intervals. If approved in advance by the Administrator, the maintenance for these items may differ from that specified in the manufacturer's maintenance instructions.

(C) Readjustment of the engine low idle speed may be performed once during the first 125 hours of engine operation.

(ii) Unscheduled maintenance may be performed on durability-data engines, except as provided in paragraph (d) (2) (v) (A) of this section, only under the following provisions:

(A) Injectors may be changed if a persistent misfire is detected.

(B) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to that performed as scheduled maintenance under paragraph (d) (2) (i) of this section, if the idle speed exceeds the manufacturer's recommended idle speed by 300 r.p.m. or more, or if there is a problem of stalling.

(iii)-(iv) [Reserved.]

(v) Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on durability-data engines shall be performed only with the advance approval of the Administrator.

(A) In the case of unscheduled maintenance such approval will be given if the Administrator:

(1) Has made a preliminary determination that part failure or system malfunction, or the repair of such failure or malfunction does not render the engine unrepresentative of engines in use, and does not require direct access to the combustion chamber, except for fuel injection component, or removable pre-chamber removal or replacement; and

(2) Has made a determination that the need for maintenance or repairs is indicated by an overt indication of malfunction such as persistent misfiring, engine overheating, fluid leakage, loss of oil pressure, excessive fuel consumption, or excessive power loss.

(B) Emission measurements may not be used as a means of determining the need for unscheduled maintenance under paragraph (d) (2) (v) (A) (1) of this section.

(C) Requests for authorization of scheduled maintenance of emission-control-related components not specifically authorized to be maintained by these regulations must be made prior to the beginning of durability testing. The Administrator will approve the performance of such maintenance if the manufacturer makes a satisfactory showing that the maintenance will be performed on engines in use.

(vi) If the Administrator determines that part failure or system malfunction occurrence and/or repair rendered the engine unrepresentative of engines in use, the engine shall not be used as a durability-data engine.

(3) (i) Scheduled maintenance on emission-data engines is limited to the adjustment of idle speed once before the 125-hour test point, provided the idle speed is outside the manufacturer's specifications shown on the engine label (see § 86.078-35(a) (iii)).

(ii) Any other engine, emission-control system, or fuel system adjustment, repair, removal, disassembly, cleaning, servicing, or replacement shall be performed only with the advance approval of the Administrator.

(4) [Reserved.]

(5) (i) Complete emission tests (see §§ 86.877-5 through 86.877-14 and §§ 86.977-5 through 86.977-15) are required, unless waived by the Administrator, before and after:

(A) Scheduled maintenance approved for durability-data engines.

(B) Unscheduled maintenance which may reasonably be expected to affect emissions.

(ii) The tests before and after scheduled maintenance, which are performed on durability-data engines prior to 117 hours are waived. The test before scheduled maintenance, which is performed on durability-data engines after 117 hours and prior to 133 hours, is waived. The after-maintenance test must be run and the results used in the deterioration factor calculation in accordance with § 86.078-28(c) (4) (i) (B) or (C).

(iii) The idle speed reset and any scheduled maintenance on the emission-

data engine shall be performed prior to the 125-hour test. The before-maintenance and after-maintenance test associated with idle speed reset and scheduled maintenance on the emission-data engine are waived.

(iv) Test data required by this paragraph shall be air posted to the Administrator within 72 hours of the test completion (or delivered within 5 working days), along with a complete record of all pertinent maintenance.

(v) When unscheduled maintenance is approved, a preliminary engineering report, unless waived by the Administrator, shall be air posted within 72 hours (or delivered within 5 working days). A final engineering report shall be delivered or air posted within 10 working days after the completion of the emission tests. The Administrator may approve an extension of the time requirements for the final engineering report.

(vi) All test data, maintenance reports and required engineering reports shall be compiled and provided to the Administrator in accordance with § 86.078-23.

(6) The Administrator shall be given the opportunity to verify the existence of an overt indication of part failure and/or engine malfunction (e.g., misfiring, stalling).

(7) Equipment, instruments, or tools may not be used to identify malfunctioning, maladjusted, or defective engine components unless the same or equivalent equipment, instruments, or tools will be available to dealerships and other service outlets and

(i) Are used in conjunction with scheduled maintenance on such components;

(ii) Are used subsequent to the identification of an engine failure or malfunction, as provided in paragraph (d) (2) (v) (A) of this section for durability-data engines or paragraph (d) (3) of this section for emission-data engines; or

(iii) Unless specifically authorized by the Administrator.

§ 86.078-26 Mileage and service accumulation; emission measurements.

(a) (1) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The procedure for mileage accumulation will be the Durability Driving Schedule as specified in Appendix IV of this part. A modified procedure may also be used if approved in advance by the Administrator. Except with the advance approval of the Administrator, all vehicles will accumulate mileage at a measured curb weight which is within 100 pounds of the estimated curb weight. If the loaded vehicle weight is within 100 pounds of being included in the next higher inertia weight class as specified in § 86.129, the manufacturer may elect to conduct the respective emission tests at the inertia weight corresponding to the higher loaded vehicle weight.

(3) Emission-data vehicles. Unless as otherwise provided for in § 86.078-23(a), emission-data vehicles shall be operated and tested as follows:

(i) Gasoline-fueled. (A) Each gasoline-fueled emission-data vehicle shall

be driven 4000 miles with all emission control systems installed and operating. Complete exhaust emission tests shall be conducted at zero and 4000 miles on those vehicles selected under § 86.078-24 (b) (1) (ii) through (b) (1) (v). Complete exhaust and evaporative emission tests shall be conducted at zero miles and 4000 miles on those vehicles selected under § 86.078-24 (b) (1) (vii). The manufacturer may at his option test the vehicles selected under § 86.078-24 (b) (1) (vii) up to three times at the 4000-mile test point as long as the ±250-mile test tolerance is adhered to. The Administrator may determine under § 86.078-24 (f) that no testing is required.

(B) The emission-data vehicle(s) selected for testing under § 86.078-24 (b) (1) (v) or (b) (1) (vii) (D) shall be driven 6436 kilometers (4000 miles) at any altitude. Emission tests shall be conducted at zero kilometers (zero miles) at any altitude and 6436 kilometers (4000 miles) under high-altitude conditions.

(C) The emission-data vehicle(s) selected for testing under § 86.078-24 (b) (1) (v) or (b) (1) (vii) (D) and permitted to be tested for purposes of § 86.078-23 (c) (1) (ii) under the provisions of § 86.078-24 (b) (1) (vi) shall be driven 6436 kilometers (4000 miles) at low altitude. Emission tests shall be conducted at zero kilometers (zero miles) at low altitude and 6436 kilometers (4000 miles) under both low- and high-altitude conditions. For the purposes of this subparagraph, "low altitude" means any elevation less than 549 meters (1800 feet).

(ii) Diesel. (A) Each Diesel emission-data vehicle shall be driven 6436 kilometers (4000 miles) with all emission control systems installed and operating. Emission tests shall be conducted at zero kilometers (zero miles) and 6436 kilometers (4000 miles).

(B) The emission-data vehicle(s) selected for testing under § 86.078-24 (b) (1) (v) shall be driven 6436 kilometers (4000 miles) at any altitude. Emission tests shall be conducted at zero kilometers (zero miles) at any altitude and 6436 kilometers (4000 miles) under high-altitude conditions.

(C) The emission-data vehicle(s) selected for testing under § 86.078-24 (b) (1) (v) and permitted to be tested for purposes of § 86.078-23 (c) (1) (ii) under the provisions of § 86.078-24 (b) (1) (vi) shall be driven 6436 kilometers (4000 miles) at low altitude. Emission tests shall be conducted at zero kilometers (zero miles) at low altitude and 6436 kilometers (4000 miles) under both low- and high-altitude conditions. For the purpose of this subparagraph "low altitude" means any elevation less than 549 meters (1800 feet).

(4) Durability-data vehicles. Unless as otherwise provided for in § 86.078-23(a), durability-data vehicles shall be operated and tested as follows:

(i) Gasoline-fueled. Each gasoline-fueled durability-data vehicle selected by the Administrator or elected by the manufacturer under § 86.078-24 (c) (1) shall be driven, with all emission control

systems installed and operating, for 50,000 miles or such lesser distance as the Administrator may agree to as meeting the objective of this procedure. Complete exhaust emission tests shall be made on all durability-data vehicles selected by the Administrator or elected by the manufacturer under § 86.078-24(c) at the following mileage points: 0; 5,000; 10,000; 15,000; 20,000; 25,000; 30,000; 35,000; 40,000; 45,000; 50,000. The Administrator may determine under § 86.078-24(f) that no testing is required.

(ii) *Diesel.* Each Diesel durability-data vehicle shall be driven, with all emission control systems installed and operating, for 50,000 miles or such lesser distance as the Administrator may agree to as meeting the objectives of the procedure. Complete emission tests (see §§ 86.106 through 86.145) shall be made at the following mileage points: 0; 5,000; 10,000; 15,000; 20,000; 25,000; 30,000; 35,000; 40,000; 45,000; 50,000.

(5) All tests required by this subpart to be conducted after every 5,000 miles of driving for durability-data vehicles and 4,000 miles for emission-data vehicles must be conducted at any accumulated mileage within 250 miles of each of those test points.

(6)(i) The results of each emission test shall be supplied to the Administrator immediately after the test. The manufacturer shall furnish to the Administrator explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided test. If a manufacturer conducts multiple tests at any test point at which the data are intended to be used in the calculation of the deterioration factor, the number of tests must be the same at each point and may not exceed three valid tests. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) shall be air posted to the Administrator within 24 hours (or delivered within 3 working days). In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.078-23. Where the Administrator conducts a test on a durability-data vehicle at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be rounded, using the "Rounding Off Method" specified in ASTM E29-67, to the number of places to the right of the decimal point indicated by expressing the applicable emission standards of this subpart to three significant figures.

(7) Whenever the manufacturer proposes to operate and test a vehicle which may be used for emission or durability data, he shall provide the zero-mile test data to the Administrator (except for those vehicles for which the zero-mile test requirement has been waived under § 86.078-23(a)(2)) and make the vehicle available for such testing under § 86.078-29 as the Administrator may require before beginning to accumulate mileage on

the vehicle. Failure to comply with this requirement will invalidate all test data submitted for this vehicle.

(8) Once a manufacturer begins to operate an emission-data or durability-data vehicle, as indicated by compliance with paragraph (a)(7) of this section, he shall continue to run the vehicle to 4,000 miles or 50,000 miles, respectively, and the data from the vehicle will be used in the calculations under § 86.078-28. Discontinuation of a vehicle shall be allowed only with the written consent of the Administrator.

(9)(i) The Administrator may elect to operate and test any test vehicle during all or any part of the mileage accumulation and testing procedure. In such cases, the manufacturer shall provide the vehicle(s) to the Administrator with all information necessary to conduct this testing.

(ii) The test procedures in §§ 86.106 through 86.145 will be followed by the Administrator. The Administrator will test the vehicles at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other vehicles of that combination to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall be used in the determination of deterioration factors.

(10) Emission testing of any type with respect to any certification vehicle other than that specified in this part is not allowed except as such testing may be specifically authorized by the Administrator.

(11) This section does not apply to testing conducted to meet the requirements of § 86.078-23(b)(2).

(b)(1) Paragraph (b) of this section applies to gasoline-fueled heavy-duty engines.

(2) The engine dynamometer service accumulation schedule will consist of several operating conditions which give the same percentage of time at various manifold vacuums and modes as specified in the emission test cycle. The average speed shall be between 1,650 and 1,700 r.p.m. Subject to the requirements as to average speed, there must be operation at speeds in excess of 3,200 r.p.m. (but not in excess of governed speed for governed engines or rated speed for nongoverned engines) for a cumulative maximum of 0.5 percent of the actual cycle time, excluding time in transient conditions. Maximum cycle time shall be 15 minutes. A cycle approved in advance by the Administrator shall be used.

(3) *Emission-data engines.* Unless as otherwise provided for in § 86.078-23(a), emission-data engines shall be operated and tested as follows: Each emission-data engine shall be operated for 125 hours with all emission control systems installed and operating. Emission tests

shall be conducted at zero and 125 hours. Evaporative emission controls need not be connected provided normal operating conditions are maintained in the engine induction system.

(4) *Durability-data engines.* Unless as otherwise provided for in § 86.078-23(a), durability-data engines shall be operated and tested as follows: Each durability-data engine shall be operated with all emission control systems installed and operating, for 1,500 hours. Emission tests shall be conducted at zero hours and at each 125-hour interval. Evaporative emission controls need not be connected provided normal operating conditions are maintained in the engine induction system.

(5) All tests required by this subpart to be conducted after 125 hours of operation or at any multiple of 125 hours may be conducted at any accumulated number of hours within 8 hours of 125 hours or the appropriate multiple of 125 hours, respectively.

(6)(i) The results of each emission test shall be supplied to the Administrator within 72 hours (or delivered within 5 working days). The manufacturer shall furnish to the Administrator an explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided test. If a manufacturer conducts multiple tests at any test point at which the data are intended to be used in the calculation of the deterioration factor, the number of tests must be the same at each point and may not exceed three valid tests. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) shall be air posted to the Administrator within 72 hours (or delivered within 5 working days). In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.078-23. Where the Administrator conducts a test on a durability-data engine at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be recorded and reported to the Administrator using two places to the right of the decimal point. These numbers shall be rounded in accordance with the "Rounding Off Method" specified in ASTM E29-67.

(7) Whenever the manufacturer proposes to operate and test an engine which may be used for emission or durability data, he shall provide the zero-hour test data to the Administrator (except for those engines for which the zero-hour test requirement has been waived under § 86.078-23(a)(2)) and make the engine available for such testing under § 86.078-29 as the Administrator may require, before beginning to accumulate hours on the engine. Failure to comply with this requirement will invalidate all test data later submitted for this engine.

(8) Once a manufacturer begins to operate an emission-data or durability-data engine, as indicated by compliance with paragraph (b)(7) of this section,

he shall continue to run the engine to 125 hours or 1,500 hours, respectively, and the data from the engine will be used in the calculations under § 86.078-28. Discontinuation of an engine shall be allowed only with the prior written consent of the Administrator.

(9)(i) The Administrator may elect to operate and test any test engine during all or any part of the service accumulation and testing procedure. In such cases the manufacturer shall provide the engine(s) to the Administrator with all information necessary to conduct the testing.

(ii) The test procedures (§§ 86.777-5 through 86.777-15) will be followed by the Administrator. The Administrator will test the engines at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other engines of that combination to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall be used in the determination of deterioration factors.

(10) Emission testing of any type with respect to any certification engine other than that specified in this subpart is not allowed except as such testing may be specifically authorized by the Administrator.

(c)(1) Paragraph (c) of this section applies to Diesel heavy-duty engines.

(2) The procedures set forth in this section describe the service accumulation that shall be accomplished on each test engine and when tests are to be conducted.

(3)(i) *Emission-data engines.* Unless as otherwise provided for in § 86.078-23 (a), emission-data engines shall be operated and tested as follows: Each emission-data engine shall be operated for 125 hours with all emission control systems installed and operating. Emission tests shall be conducted at zero and 125 hours.

(ii) *Durability-data engines.* Unless as otherwise provided for in § 86.078-23 (a), durability-data engines shall be operated and tested as follows: Each durability-data engine shall be operated, with all emission control systems installed and operating, for 1,000 hours. Emission tests shall be conducted at zero hours and at each 125-hour interval.

(4) A break-in procedure, not to exceed 20 hours, may be run if approved in writing in advance by the Administrator. This procedure would be run after the zero-hour test, and the hours accumulated would not be counted as part of the service accumulation.

(5) Before service accumulation can begin, the following criteria must be met. Failure to comply with these requirements shall invalidate all test data submitted for an engine.

(1) Each engine shall produce at least 95 percent of the maximum horsepower, corrected to rating conditions, at 95 to 100 percent of the rated speed.

(ii) The fuel rate at maximum horsepower shall be within manufacturer's specifications.

(iii) The zero-hour test data shall be provided to the Administrator (except for those engines for which the zero-hour test requirement has been waived under § 86.078-23(a)(2)) and the engine shall be made available for such testing under § 86.078-29 as the Administrator may require.

(6) During service accumulation, hours can be credited toward the required service accumulation hours when the following criteria are met. If these criteria cannot be met, engine operation shall be discontinued and the Administrator shall be notified immediately. (Adjustments to the fuel rate can be approved under the provisions of § 86.078-25).

(i) Each engine shall produce at least 95 percent of the maximum horsepower, at 95 to 100 percent of the rated speed, observed during zero-hour testing. Horsepower values shall be corrected to the rating conditions.

(ii) The engine shall be operated at 75 percent of the inlet and exhaust restrictions specified in § 86.877-8 except that the tolerance will be ± 3 inches of water and ± 0.5 inches of Hg, respectively.

(7) During each emission test the inlet and exhaust restrictions shall be as specified § 86.877-8.

(8) Tests, other than zero-hour tests, may be conducted within 8 hours of the nominal test point.

(9)(i) The results of each emission test shall be air posted to the Administrator within 72 hours of test completion (or delivered within 5 working days). The manufacturer shall furnish to the Administrator an explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided tests. If a manufacturer conducts multiple tests (not to exceed three valid tests) at any test point, the number of tests must be the same at each point. The data obtained from all valid tests shall be used in the calculation of the deterioration factor. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) shall be air posted to the Administrator within 72 hours (or delivered within 5 working days). In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.078-23. Where the Administrator conducts a test on a durability-data engine at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be recorded and reported to the Administrator using two places to the right of the decimal point. These numbers shall be rounded in accordance with the "Rounding Off Method" specified in ASTM E29-67.

(10) Once a manufacturer begins to operate an emission-data or durability-data engine, as indicated by compliance with paragraph (c) of this section, he shall continue to run the engine to 125 hours or 1,000 hours respectively, and the data from the engine shall be used in the calculations under § 86.078-28. Discontinuation of an engine shall be allowed only with the prior written consent of the Administrator.

(11)(i) The Administrator may elect to operate and test any test engine during all or any part of the service accumulation and testing procedure. In such cases, the manufacturer shall provide the engine(s) to the Administrator with all information necessary to conduct the testing.

(ii) The test procedures (§§ 86.877-5 through 86.877-14 and §§ 86.977-5 through 86.977-15) will be followed by the Administrator. The Administrator will test the engines at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other engines of that combination to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall be used in the determination of deterioration factors.

(12) Emission testing of any type with respect to any certification engine other than that specified in this part is not allowed except as such testing may be specifically authorized by the Administrator.

§ 86.078-27 Special test procedures.

(a) For light-duty vehicles or light-duty trucks, the Administrator may, on the basis of a written application therefore by a manufacturer, prescribe test procedures other than those set forth in this part for any motor vehicle which he determines is not susceptible to satisfactory testing by the procedures set forth in Subpart B.

(b) For heavy-duty engines, the Administrator may prescribe test procedures other than those set forth in this part for any motor vehicle engine which he determines is not susceptible to satisfactory testing by the procedures set forth in Subparts H, I, or J.

§ 86.078-28 Compliance with emission standards.

(a)(1) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The applicable exhaust and fuel evaporative emission standards of this subpart apply to the emissions of vehicles for their useful life.

(3) Since it is expected that emission control efficiency will change with mileage accumulation on the vehicle, the emission level of a vehicle which has accumulated 50,000 miles will be used as

the basis for determining compliance with the standards.

(4) The procedure for determining compliance of a new motor vehicle with exhaust emission standards is as follows:

(1) Separate emission deterioration factors shall be determined from the exhaust emission results of the durability-data vehicle(s) for each engine-system combination. A separate factor shall be established for exhaust HC, exhaust CO, and exhaust NOx for each engine-system combination. A separate evaporative emission deterioration factor shall be determined for each evaporative emission family- evaporative emission control system combination from the testing conducted by the manufacturer.

(A) The applicable results to be used in determining the exhaust emission deterioration factors for each engine-system combination shall be:

(1) All valid exhaust emission data from the tests required under § 86.078-26(a) (4), except the zero-mile tests. This shall include the official test results, as determined in § 86.078-29 for all tests conducted on all durability-data vehicles of the combination selected under § 86.078-24(c) (including all vehicles elected to be operated by the manufacturer under § 86.078-24(c) (1) (ii)).

(2) All exhaust emission data from the tests conducted before and after the scheduled maintenance provided in § 86.078-25.

(3) All exhaust emission data from tests required by maintenance approved under § 86.078-25, in those cases where the Administrator conditioned his approval for the performance of such maintenance on the inclusion of such data in the deterioration factor calculation.

(B) All applicable exhaust emission results shall be plotted as a function of the mileage on the system, rounded to the nearest mile, and the best fit straight lines, fitted by the method of least squares, shall be drawn through all these data points. The interpolated 4,000- and 50,000-mile points on this line must be within the standards provided in § 86.078-8 or § 86.078-9, as applicable, or the data will not be acceptable for use in calculation of a deterioration factor, unless no applicable data point exceeded the standard. An exhaust emission deterioration factor shall be calculated for each engine-system combination as follows:

Factor—Exhaust emissions interpolated to 50,000 miles divided by exhaust emissions interpolated to 4,000 miles.

These interpolated values shall be carried out to a minimum of four places to the right of the decimal point before dividing one by the other to determine the deterioration factor. The results shall be rounded to three places to the right of the decimal point in accordance with ASTM E 29-67.

(C) An evaporative emissions deterioration factor shall be determined from the testing conducted as described in

§ 86.078-21(b) (4) (ii), for each evaporative emission family- evaporative emission control system combination to indicate the evaporative emission level at 50,000 miles relative to the evaporative emission level at 4,000 miles as follows:

Factor—Evaporative emission level at 50,000 miles minus the evaporative emission level at 4,000 miles.

The factor shall be established to a minimum of two places to the right of the decimal.

(1) (A) The official exhaust-emission test results for each emission data vehicle at the 4,000-mile test point shall be multiplied by the appropriate deterioration factor: *Provided*, That if a deterioration factor as computed in paragraph (a) (4) (i) (B) of this section is less than one, that deterioration factor shall be one for the purposes of this paragraph.

(B) The official evaporative emission test results for each evaporative emission-data vehicle at the 4000-mile test point shall be adjusted by addition of the appropriate deterioration factor: *Provided*, That if a deterioration factor as computed in paragraph (a) (4) (i) (c) of this section is less than zero, that deterioration factor shall be zero for the purposes of this paragraph.

(iii) The emissions to compare with the standard shall be the adjusted emissions of paragraphs (a) (4) (ii) (A) and (B) of this section for each emission-data vehicle. Before any emission value is compared with the standard, it shall be rounded, in accordance with ASTM E 29-67, to two significant figures. The rounded emission values may not exceed the standard.

(iv) Before any engine family- evaporative emission family combination may be certified, every test vehicle selected under § 86.078-24 (b) (1) (ii) through (b) (1) (v) to represent that engine family must comply with all exhaust emission standards for which it was tested (as determined in paragraph (a) (4) (iii) of this section) and every test vehicle selected under § 86.078-24(b) (1) (vii) to represent that evaporative emission family must comply with all exhaust and evaporative emission standards for which it was tested (as determined in paragraph (a) (4) (iii) of this section).

(v) [delete]

(b) (1) Paragraph (b) of this section applies to gasoline-fueled heavy-duty engines.

(2) The exhaust emission standards in § 86.078-10 apply to the emissions of engines for their useful life.

(3) Since emission control efficiency decreases with the accumulation of hours on the engine, the emission level of an engine which has accumulated 1,500 hours of dynamometer operation will be used as the basis for determining compliance with the standards.

(4) The procedure for determining compliance of a new engine with exhaust emission standards is as follows:

(1) Separate emission deterioration factors shall be determined from the emission results of the durability-data engines for each engine-system combination. Separate factors shall be estab-

lished for CO and for the combined emissions of HC and NOx.

(A) The applicable results to be used in determining the deterioration factors for each combination shall be:

(1) All valid emission data from the tests required under § 86.078-26(b) (4), except the zero-hour tests. This shall include the official test results, as determined in § 86.078-29, for all tests conducted on all durability-data engines of the combination selected under § 86.078-24(c) (2) (including all engines elected to be operated by the manufacturer under § 86.078-24(c) (2) (iii)).

(2) All emission data from the test conducted before and after maintenance provided in § 86.078-25(c) (2) (i) (A).

(3) All emission data from the test conducted before and after maintenance provided in § 86.078-25(c) (2) (v) (C) if emission tests were conducted.

(B) All applicable emission results for (1) HC+NOx and (2) CO shall be plotted as a function of durability hours which shall be consistently rounded to the nearest hour. Emission data shall have two figures to the right of the decimal. The best fit straight lines (1) HC+NOx and (2) CO, fitted by the method of least squares, shall be drawn through these data points. The interpolated 125-hour and 1500-hour points on each line, rounded to whole numbers in accordance with ASTM E 29-67, must be within the standards specified in § 86.078-10 or the data shall not be used in the calculation of a deterioration factor, unless no applicable data points exceed the standards.

(C) The interpolated values shall be used to calculate a deterioration factor as follows:

Factor—Exhaust emissions interpolated to 1500 hours minus the exhaust emissions interpolated to 125 hours. (Negative deterioration factors shall be considered zero.)

(1) The appropriate deterioration factor, carried out to two places to the right of the decimal point, shall be added to the exhaust emission test results, carried out to two places to the right of the decimal point, for each emission-data engine.

(iii) The emission values to compare with the standards shall be the adjusted emission values of paragraph (b) (4) (ii) of this section rounded to whole numbers in accordance with ASTM E 29-67 for each emission-data engine.

(iv) Every test engine of an engine family must comply with all applicable standards, as determined in paragraph (b) (4) (iii) of this section, before any engine in that family will be certified.

(c) (1) Paragraph (c) of this section applies to Diesel heavy-duty engines.

(2) The emission standards in § 86.078-11 apply to the emissions of engines for their useful lives.

(3) Since emission control efficiency decreases with accumulation of hours on the engine, the emission level of an engine which has accumulated 1,000 hours of dynamometer operation will be used as the basis for determining compliance with the standards.

(4) The procedure for determining compliance with emission standards for Diesel heavy-duty engines is as follows:

(1) Emission deterioration factors for the acceleration mode (designated as "A"), the lugging mode (designated as "B"), the peak opacity (designated as "C"), the CO exhaust emissions, and the HC+NOx exhaust emissions shall be established separately for each engine-system combination.

(A) The applicable results to be used in determining the deterioration factors for each combination shall be:

(1) All emission data from the tests required under § 86.078-26(c) (3) (ii), except the zero-hour tests. This shall include the official test results, as determined in § 86.078-29, for all tests conducted on all durability-data engines of the combination selected under § 86.078-24(c) (3) (i) (including all engines elected to be operated by the manufacturer under § 86.078-24(c) (3) (ii)).

(2) All emission data from the tests conducted before and after the maintenance provided in § 86.078-25(d) (2) (1) (A) if emission tests were conducted.

(3) All emission data from the tests conducted before and after maintenance provided in § 86.078-25(d) (2) (v) (C) if emission tests were conducted.

(B) All applicable emission results for (1) HC+NOx, (2) CO, (3) acceleration smoke ("a"), (4) lugging smoke ("b"), and (5) peak smoke ("c") shall be plotted as a function of durability hours which shall be consistently rounded to the nearest hour. Emission data shall have two figures to the right of the decimal. The best fit straight lines, fitted by the method of least squares, shall be drawn through these data points. The interpolated 125- and 1000-hour points on each line, rounded to whole numbers in accordance with ASTM E 29-67, must be within the standards specified in § 86.078-11 or the data shall not be used in the calculation of the deterioration factor, unless no applicable data points exceeded the standards.

(C) The interpolated values shall be used to calculate a deterioration factor as follows:

Factor = Exhaust emissions (both smoke and gaseous) interpolated to 1000 hours minus the exhaust emissions interpolated to 125 hours. (Negative deterioration factors shall be considered zero).

(ii) The appropriate deterioration factor, carried out to two places to the right of the decimal point, shall be added to the exhaust emission test results, carried out to two places to the right of the decimal point, for each emission-data engine.

(iii) The emission values to compare with the standards shall be the adjusted emission values of paragraph (c) (4) (ii) of this section rounded to whole numbers in accordance with ASTM E 29-67 for each emission-data engine.

(iv) Every test engine of an engine family must comply with all applicable standards, as determined in paragraph (c) (4) (iii) of this section, before any engine in that family will be certified.

§ 86.078-29 Testing by the Administrator.

(a) (1) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The Administrator may require that any one or more of the test vehicles be submitted to him, at such place or places as he may designate, for the purposes of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(3) (i) Whenever the Administrator conducts a test on a test vehicle, the results of that test shall, unless subsequently invalidated by the Administrator, comprise the official data for the vehicle at the prescribed test point and the manufacturer's data for that prescribed test point shall not be used in determining compliance with emission standards.

(ii) Whenever the Administrator does not conduct a test on a test vehicle at a test point, the manufacturer's test data will be accepted as the official data for that test point: *Provided*, That if the Administrator makes a determination based on testing under paragraph (a) (2) of this section, that there is a lack of correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer, *And Further Provided*, That if the Administrator has reasonable basis to believe that any test data submitted by the manufacturer is not accurate or has been obtained in violation of any provisions of this part, the Administrator may refuse to accept that data as the official data pending retesting or submission of further information. If the manufacturer conducts more than one test on a vehicle, as authorized under § 86.078-26(a) (3) (1) (A), the data from the last test in that series of tests on that vehicle, will constitute the official data.

(iii) (A) The emission-data vehicle presented to the Administrator for testing shall be calibrated within the production tolerances applicable to the manufacturer's specifications to be shown on the vehicle label (see § 86.078-35 (a) (1) (iii) (D)) as specified in the application for certification. If the Administrator determines that a vehicle is not within such tolerances, the vehicle shall be adjusted, at the facility designated by the Administrator, prior to the test and an engineering report shall be submitted to the Administrator describing the corrective action taken. Based on the engineering report, the Administrator will determine if the vehicle shall be used as an emission-data vehicle.

(B) If the Administrator determines that the test data developed on an emission-data vehicle under paragraph (a) (3) (1) of this section would cause that vehicle to fail due to excessive 4000 mile emissions or by application of the appropriate deterioration factor, then the following procedure shall be observed:

(1) The manufacturer may request a retest. Before the retest, the vehicle may be readjusted to manufacturer's specifications, if these adjustments were made incorrectly prior to the first test, and other maintenance or repairs may be performed in accordance with § 86.078-25. All work on the vehicle shall be done at such location and under such conditions as the Administrator may prescribe.

(2) The vehicle will be retested by the Administrator and the results of this test shall comprise the official data for the emission-data vehicle.

(iv) If sufficient durability data are not available at the time of any emission test conducted under paragraph (a) (2) of this section to enable the Administrator to determine whether an emission-data vehicle would fail, the manufacturer may request a retest in accordance with the provisions of paragraphs (a) (3) (iii) (A) and (B) of this section. If the manufacturer does not promptly make such request, he shall be deemed to have waived the right to a retest. A request for retest must be made before the manufacturer removes the vehicle from the test premises.

(b) (1) Paragraph (b) of this section applies to heavy-duty engines.

(2) The Administrator may require that any one or more of the test engines be submitted to him, at such place or places as he may designate, for the purpose of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(3) (i) Whenever the Administrator conducts a test on a test engine the results of that test, unless subsequently invalidated by the Administrator, shall comprise the official data for the engine at that prescribed test point and the manufacturer's data for that prescribed test point shall not be used in determining compliance with emission standards.

(ii) Whenever the Administrator does not conduct a test on a test engine at a test point, the manufacturer's test data will be accepted as the official data for that test point. *Provided*, That if the Administrator makes a determination based on testing under paragraph (b) (2) of this section, that there is a lack of correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by

the manufacturer, *And Further Provided*, That if the Administrator has reasonable basis to believe that any test data submitted by the manufacturer is not accurate or has been obtained in violation of any provision of this part, the Administrator may refuse to accept that data as the official data pending retesting or submission of further information.

(iii) (A) The emission-data engine presented to the Administrator for testing shall be calibrated within the production tolerances applicable to the manufacturer's specifications to be shown on the engine label (see § 86.078-35(a)(2)(iii)) as specified in the application for certification. If the Administrator determines that an engine is not within such tolerances, the engine shall be adjusted at the facility designated by the Administrator prior to the test and an engineering report shall be submitted to the Administrator describing the corrective action taken. Based on the engineering report the Administrator will determine if the engine shall be used as an emission-data engine.

(B) If the Administrator determines that the test data developed under paragraph (b)(3)(iii)(A) of this section would cause the emission-data engine to fall due to excessive 125-hour emission values or by the application of the appropriate deterioration factor, then the following procedure shall be observed.

(1) The manufacturer may request a retest. Before the retest, the engine may be readjusted to manufacturer's specifications, if these adjustments were made incorrectly prior to the first test, and other maintenance or repairs may be performed in accordance with § 86.078-25. All work on the engine shall be done at such location and under such conditions as the Administrator may prescribe.

(2) The engine will be retested by the Administrator and the results of this test shall comprise the official data for the emission-data engine.

(iv) If sufficient durability data are not available at the time of any emission test conducted under paragraph (b)(2) of this section to enable the Administrator to determine whether an emission-data engine would fail, the manufacturer may request a retest in accordance with the provisions of paragraphs (b)(3)(iii)(B)(1) and (2) of this section. If the manufacturer does not promptly make such request, he shall be deemed to have waived the right to a retest. A request for retest must be made before the manufacturer removes the engine from the test premises.

§ 86.078-30 Certification.

(a) (1) If, after a review of the test reports and data submitted by the manufacturer, data derived from any inspection carried out under § 86.078-7(c) and any other pertinent data or information, the Administrator determines that a test vehicle(s) (or test engine(s)) meets the requirements of the Act and of this sub-

part, he will issue a certificate of conformity with respect to such vehicle(s) (or engine(s)) except in cases covered by paragraph (c) of this section. If applicable, the certificate will state which vehicles are certified for sale at high altitude.

(2) Such certificate will be issued for such period not to exceed one model year as the Administrator may determine and upon such terms as he may deem necessary to assure that any new motor vehicle (or new motor vehicle engine) covered by the certificate will meet the requirements of the Act and of this part. Each such certificate shall contain the following language:

This certificate covers only those new motor vehicles (or new motor vehicle engines) which conform, in all material respects, to the design specifications that applied to those vehicles (or engines) described in the application for certification and which are produced during the ---- model year production period of the said manufacturer, as defined in 40 CFR § 86.078-2.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR § 86.078-7(c) which concern either the vehicle (or engine) certified, or any production vehicle (or production engine) covered by this certificate, or any production vehicle (or production engine) which when completed will be claimed to be covered by this certificate. Failure to comply with all the requirements of § 86.078-7(c) with respect to any such vehicle (or engine) may lead to revocation or suspension of this certificate as specified in 40 CFR § 86.078-30(c). It is also a term of this certificate that this certificate may be revoked or suspended for the other reasons stated in § 86.078-30(c) or (d).

(3) One such certificate will be issued for each engine family and will certify compliance with no more than one set of applicable standards except that for gasoline-fueled light-duty vehicles and light-duty trucks, one such certificate will be issued for each engine family- evaporative emission family combination and will certify compliance with no more than one set of applicable standards.

(4) A violation of section 203(a)(1) of the Clean Air Act occurs when any manufacturer sells, offers for sale, introduces or delivers for introduction into commerce, any light-duty vehicle or light-duty truck, subject to the regulations under the Act, which is not covered by a certificate of conformity at high altitude issued under this part:

(i) At a designated high-altitude location, unless such manufacturer has substantial reason to believe that such motor vehicle will not be sold to an ultimate purchaser for principal use at a designated high-altitude location; or,

(ii) At an other than designated high-altitude location, when such manufacturer has reason to believe that such motor vehicle is intended by the ultimate purchaser to be used principally at a designated high-altitude location.

(5) For the purpose of paragraph (a) of this section, "designated high-altitude location" is any county which has sub-

stantially all of its area located above 1219 meters (4,000 feet) and which is identified below.

COUNTIES LOCATED SUBSTANTIALLY ABOVE 1,219 METERS (4,000 FEET) IN ELEVATION

STATE OF ARIZONA	
Apache	Navajo
STATE OF COLORADO	
Adams	Jefferson
Alamosa	Lake
Arapahoe	La Plata
Archuleta	Larimer
Boulder	Las Animas
Chaffee	Lincoln
Clear Creek	Mesa
Conejos	Mineral
Costilla	Moffat
Crowley	Montezuma
Custer	Montrose
Dolores	Morgan
Delta	Ouray
Denver	Park
Douglas	Pitkin
Eagle	Pueblo
Elbert	Rio Blanco
El Paso	Rio Grande
Freemont	Routt
Garfield	Saguache
Gilpin	San Juan
Grand	San Miguel
Gunnison	Summit
Hinsdale	Teller
Huerfano	Washington
Jackson	Weld
STATE OF IDAHO	
Bannock	Custer
Bear Lake	Franklin
Bingham	Freemont
Blaine	Jefferson
Bonneville	Madison
Butte	Minidoka
Camas	Oneida
Caribou	Power
Cassia	Teton
Clark	Valley
STATE OF MONTANA	
Beaverhead	Madison
Deer Lodge	Meagher
Gallatin	Park
Jefferson	Silver Bow
STATE OF NEBRASKA	
Banner	Sioux
Kimball	
STATE OF NEVADA	
Carson City	Lander
Douglas	Lyon
Elko	Mineral
Esmeralda	Storey
Eureka	White Pine
Humboldt	
STATE OF NEW MEXICO	
Bernalillo	Mora
Catron	Río Arriba
Colfax	Sandoval
Curry	San Juan
De Baca	San Miguel
Grant	Santa Fe
Guadalupe	Sierra
Lincoln	Socorro
Harding	Taos
Lincoln	Torrance
Los Alamos	Union
Luna	Valencia
McKinley	
STATE OF OREGON	
Lake	

STATE OF UTAH

Beaver	Plute
Box Elder	Rich
Cache	Salt Lake
Carbon	San Juan
Daggett	Sanpete
Davis	Sevier
Duchesne	Summit
Emery	Tocele
Grand	Uintah
Iron	Utah
Juab	Wasatch
Kane	Wayne
Millard	Weber
Morgan	

STATE OF WYOMING

Albany	Natrona
Carbon	Niobrara
Converse	Park
Fremont	Platte
Goshen	Sublette
Hot Springs	Sweetwater
Johnson	Teton
Laramie	Uinta
Lincoln	Weston

(6) The provisions of paragraph (a) (4) of this section shall not apply to any light-duty vehicle or light-duty truck, sold, offered for sale, introduced, or delivered for introduction into commerce in California, provided that the vehicle is covered by a certificate of conformity with emission standards in effect in California.

(7) Certificates issued for light-duty vehicles or light-duty trucks certified with catalytic converters shall be subject to the following term in addition to the term in paragraph (a) (2) of this section: "Catalyst-equipped vehicles, otherwise covered by this certificate, which are driven outside the United States, Canada, and Mexico will be presumed to have been operated on leaded gasoline resulting in deactivation of the catalysts. If these vehicles are imported or offered for importation without retrofit of the catalyst, they will be considered not to be within the coverage of this certificate unless included in a catalyst control program operated by a manufacturer or a United States Government Agency and approved by the Administrator."

(b) (1) The Administrator will determine whether a vehicle (or engine) covered by the application complies with applicable standards by observing the following relationships:

(i) *Light-duty vehicles and light-duty trucks.*

(A) The durability-data vehicle(s) selected under § 86.078-24 (c) (1) (i) shall represent all vehicles of the same engine-system combination.

(B) The emission-data vehicle(s) selected under § 86.078-24 (b) (1) (ii), (b) (1) (iii), and (b) (1) (iv) shall represent all vehicles of the same engine-system combination as applicable to be sold below 4000 ft.

(C) The emission-data vehicle(s) selected under § 86.078-24 (b) (1) (vii) (A) and (b) (1) (vii) (B) shall represent all vehicles of the same evaporative control system within the evaporative family, as applicable, to be sold below 4000 ft.

(D) The emission-data vehicle(s) selected under § 86.078-24 (b) (1) (v) shall represent all vehicles of the same engine-

system combination to be sold at high altitude.

(E) The emission-data vehicle(s) selected under § 86.078-24 (b) (1) (vii) (D) shall represent all vehicles of the same evaporative control system within the evaporative family sold at high altitude.

(ii) *Gasoline-fueled heavy-duty engines.*

(A) A test engine selected under § 86.078-24 (b) (2) (i) and (iv) shall represent all engines in the same engine family of the same engine displacement-exhaust emission control system combination.

(B) A test engine selected under § 86.078-24 (b) (2) (iii) shall represent all engines in the same engine family of the same engine displacement-exhaust emission control system combination.

(C) A test engine selected under § 86.078-24 (c) (2) (i) shall represent all engines of the same engine-system combination.

(iii) *Diesel heavy-duty engines.*

(A) A test engine selected under § 86.078-24 (b) (3) (i) shall represent all engines in the same engine-system combination.

(B) A test engine selected under § 86.078-24 (b) (3) (iii) shall represent all engines of that emission control system at the rated fuel delivery of the test engine.

(C) A test engine selected under § 86.078-24 (c) (3) (i) shall represent all engines of the same engine-system combination.

(2) The Administrator will proceed as in paragraph (a) of this section with respect to the vehicles (or engines) belonging to an engine family or engine family-*evaporative emission family combination* (as applicable), all of which comply with all applicable standards.

(3) If, after a review of the test reports and data submitted by the manufacturer, data derived from any additional testing conducted pursuant to § 86.078-29, data or information derived from any inspection carried out under § 86.078-7(c) or any other pertinent data or information, the Administrator determines that one or more test vehicles (or test engines) of the certification test fleet do not meet applicable standards, he will notify the manufacturer in writing, setting forth the basis for his determination. Within 30 days following receipt of the notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's determination and data in support of such objections. If, after a review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078-6 with respect to such issue.

(4) For light-duty vehicles and light-duty trucks the manufacturer may, at his option, proceed with any of the following alternatives with respect to an emission-data vehicle determined not

in compliance with all applicable standards for which it was tested:

(i) Request a hearing under § 86.078-6; or

(ii) Remove the vehicle configuration (or evaporative vehicle configuration, as applicable) which failed, from his application;

(A) If the failed vehicle was tested for compliance with exhaust emission standards only: The Administrator may select, in place of the failed vehicle, in accordance with the selection criteria employed in selecting the failed vehicle, a new emission-data vehicle to be tested for exhaust emission compliance only.

(B) If the failed vehicle was tested for compliance with both exhaust and evaporative emission standards: The Administrator may select, in place of the failed vehicle, in accordance with the selection criteria employed in selecting the failed vehicle, a new emission-data vehicle which will be tested for compliance with both exhaust and evaporative emission standards. If one vehicle cannot be selected in accordance with the selection criteria employed in selecting the failed vehicle, then two vehicles may be selected (i.e., one vehicle to satisfy the exhaust emission vehicle selection criteria and one vehicle to satisfy the evaporative emission vehicle selection criteria). The vehicle selected to satisfy the exhaust emission vehicle selection criteria and one vehicle to satisfy the evaporative emission vehicle selection criteria). The vehicle selected to satisfy the exhaust emission vehicle selection criteria will be tested for compliance with exhaust emission standards only. The vehicle selected to satisfy the evaporative emission vehicle selection criteria will be tested for compliance with both exhaust and evaporative emission standards; or

(ii) Remove the vehicle configuration (or evaporative vehicle configuration, as applicable) which failed from his application and add a vehicle configuration(s) (or evaporative vehicle configuration(s), as applicable) not previously listed. The Administrator may require, if applicable, that the failed vehicle be modified to the new engine code (or evaporative emission code, as applicable) and demonstrate by testing that it meets applicable standards for which it was originally tested. In addition, the Administrator may select, in accordance with the vehicle selection criteria given in § 86.078-24 (b), a new emission-data vehicle or vehicles. The vehicles selected to satisfy the exhaust emission vehicle selection criteria will be tested for compliance with exhaust emission standards only. The vehicles selected to satisfy the evaporative emission vehicle selection criteria will be tested for compliance with both exhaust and evaporative emission standards; or

(iv) Correct a component or system malfunction and show that with a correctly functioning system or component the failed vehicle meets applicable standards for which it was originally tested. The Administrator may require a new emission-data vehicle, of identical vehicle configuration (or evaporative vehicle configuration as applicable) to the failed

vehicle, to be operated and tested for compliance with the applicable standards for which the failed vehicle was originally tested.

(5) For heavy-duty engines the manufacturer may, at his option, proceed with any of the following alternatives with respect to any engine family represented by a test engine(s) determined not in compliance with applicable standards:

(i) Request a hearing under § 86.078-6; or

(ii) Delete from the application for certification the engines represented by the failing test engine. (Engines so deleted may be included in a later request for certification under § 86.078-32.) The Administrator will then select in place of each failing engine an alternate engine chosen in accordance with selection criteria employed in selecting the engine that failed; or

(iii) Modify the test engine and demonstrate by testing that it meets applicable standards. Another engine which is in all material respects the same as the first engine, as modified, shall then be operated and tested in accordance with applicable test procedures.

(6) If the manufacturer does not request a hearing or present the required data under paragraphs (b) (4) or (b) (5) (as applicable) of this section, the Administrator will deny certification.

(c) (1) Notwithstanding the fact that any certification vehicle(s) (or certification engine(s)) may comply with other provisions of this subpart, the Administrator may withhold or deny the issuance of a certificate of conformity (or suspend or revoke any such certificate which has been issued) with respect to any such vehicle(s) (or engine(s)) if:

(i) The manufacturer submits false or incomplete information in his application for certification thereof;

(ii) The manufacturer renders inaccurate any test data which he submits pertaining thereto.

(iii) Any EPA Enforcement Officer is denied access on the terms specified in § 86.078-7(c) to any facility or portion thereof which contains any of the following:

(A) The vehicle (or engine);

(B) Any components used or considered for use in its modification or build up into a certification vehicle (or certification engine);

(C) Any production vehicle (or production engine) which is or will be claimed by the manufacturer to be covered by the certificate;

(D) Any step in the construction of a vehicle (or engine) described in (C) of this subdivision;

(E) Any records, documents, reports, or histories required by this part to be kept concerning any of the above.

(iv) Any EPA Enforcement Officer is denied "reasonable assistance" (as defined in § 86.078-7(c)) in examining any of the items listed in paragraph (c) (1) (iii) of this section.

(2) The sanctions of withholding, denying, revoking, or suspending of a certificate may be imposed for the reasons in paragraphs (c) (1) (i), (ii), (iii), or

(iv) of this section only when the infraction is substantial.

(3) In any case in which a manufacturer knowingly submits false or inaccurate information or knowingly renders inaccurate or invalid any test data or commits any other fraudulent acts and such acts contribute substantially to the Administrator's decision to issue a certificate of conformity, the Administrator may deem such certificate void ab initio.

(4) In any case in which certification of a vehicle (or engine) is proposed to be withheld, denied, revoked, or suspended under paragraph (c) (1) (iii), or (c) (1) (iv) of this section, and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.078-7(c) in fact occurred, the manufacturer, if he wishes to contend that, even though the violation occurred, the vehicle (or engine) in question was not involved in the violation to a degree that would warrant withholding denial, revocation, or suspension of certification under either paragraph (c) (1) (iii) or (c) (1) (iv) of this section, shall have the burden of establishing that contention to the satisfaction of the Administrator.

(5) Any revocation or suspension of certification under paragraph (c) (1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.078-6 hereof.

(ii) Extend no further than to forbid the introduction into commerce of vehicles (or engines) previously covered by certification which are still in the hands of the manufacturer, except in cases of such fraud or other misconduct as makes certification invalid ab initio.

(6) The manufacturer may request in the form and manner specified in paragraph (b) (3) of this section that any determination made by the Administrator under paragraph (c) (1) of this section to withhold or deny certification be reviewed in a hearing conducted in accordance with § 86.078-6. If the Administrator finds, after a review of the request and supporting data, that the request raises a substantial factual issue he will grant the request with respect to such issue.

(d) (1) For light-duty vehicles and light-duty trucks. Notwithstanding the fact that any vehicle configuration or engine family may be covered by a valid outstanding certificate of conformity, the Administrator may suspend such outstanding certificate of conformity in whole or in part with respect to such vehicle configuration or engine family if:

(i) The manufacturer refuses to comply with the provisions of a test order issued by the Administrator pursuant to § 86.603; or

(ii) The manufacturer refuses to comply with any of the requirements of § 86.603; or

(iii) The manufacturer submits false or incomplete information in any report or information provided pursuant to the requirements of § 86.609; or

(iv) The manufacturer renders inaccurate any test data which he submits pursuant to § 86.609; or

(v) Any EPA Enforcement Officer is denied access to a facility on the terms specified in § 86.606.

(vi) Any EPA Enforcement Officer is denied the opportunity on the terms specified in § 86.606 to

(A) Monitor vehicle selection pursuant to § 86.607.

(B) Select vehicles for testing pursuant to § 86.607; or

(C) Monitor vehicle testing performed to satisfy any of the requirements of this part; or

(vii) Any EPA Enforcement Officer is denied "reasonable assistance" as defined in § 86.606 in examining any of the items listed in that section; or

(viii) The manufacturer refuses to comply with the requirements of §§ 86.604(a), 86.605, 86.607, 86.608, 86.610, or 86.611.

(2) The sanction of suspending a certificate may not be imposed for the reasons in paragraphs (d) (1) (i), (ii) or (viii) of this section where such refusal is caused by conditions and circumstances outside the control of the manufacturer which renders it impossible to comply with those requirements. Such conditions and circumstances shall include, but are not limited to, any uncontrollable factors which result in the temporary unavailability of equipment and personnel needed to conduct the required tests, such as equipment breakdown or failure or illness of personnel, but shall not include failure of the manufacturer to adequately plan for and provide the equipment and personnel needed to conduct the tests. The manufacturer will bear the burden of establishing the presence of the conditions and circumstances required by this paragraph.

(3) The sanctions of suspending a certificate may be imposed for the reasons in paragraphs (d) (1) (iii), (iv), (v), (vi), (vii) of this section only when the infraction is substantial.

(4) In any case in which a manufacturer knowingly submitted false or inaccurate information or knowingly rendered inaccurate any test data or committed any other fraudulent acts, and such acts contributed substantially to the Administrator's original decision not to suspend or revoke a certificate of conformity in whole or in part, the Administrator may deem such certificate void from the date of such fraudulent act.

(5) In any case in which certification of a vehicle is proposed to be suspended under paragraph (d) (1) (v), (d) (1) (vi), or (d) (1) (vii) of this section, and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.606 in fact occurred, the manufacturer, if he wishes to contend that, even though the violation occurred, the vehicle configuration or engine family in question was not involved in the violation to a degree that would warrant suspension of certification under either paragraph (d) (1) (v), (d) (1) (vi), or (d) (1) (vii) of this section.

shall have the burden of establishing that contention to the satisfaction of the Administrator.

(6) Any suspension of certification under paragraph (d)(1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.613 hereof and

(ii) Not apply to vehicles no longer in the hands of the manufacturer.

§ 86.078-31 Separate certification.

Where possible a manufacturer should include in a single application for certification all vehicles (or engines) for which certification is required. A manufacturer may, however, choose to apply separately for certification of part of his product line. The selection of test vehicles (or test engines) and the computation of test results will be determined separately for each application.

§ 86.078-32 Addition of a vehicle or engine after certification.

(a) If a manufacturer proposes to add to his product line a vehicle (or engine) of the same engine-system combination as vehicles (or engines) previously certified but which was not described in the application for certification when the test vehicle(s) (or test engine(s)) representing other vehicles (or engines) of that combination was certified, he shall notify the Administrator. Such notification shall be in advance of the addition unless the manufacturer elects to follow the procedure described in § 86.078-34.

This notification shall include a full description of the vehicle (or engine) to be added.

(b) The Administrator may require the manufacturer to perform such tests on the test vehicles (or test engine(s)) representing the vehicle (or engine) to be added which would have been required if the vehicle (or engine) had been included in the original application for certification.

(c) If, after a review of the test reports and data submitted by the manufacturer, and data derived from any testing conducted under § 86.078-29, the Administrator determines that the test vehicle(s) or test engine(s) meets all applicable standards, the appropriate certificate will be amended accordingly. If the Administrator determines that the test vehicle(s) (or test engine(s)) does not meet applicable standards, he will proceed under § 86.078-30(b).

§ 86.078-33 Changes to a vehicle or engine covered by certification.

(a) The manufacturer shall notify the Administrator of any change in production vehicles (or production engines) in respect to any of the parameters listed in § 86.078-24(a)(3), § 86.078-24(b)(1)(iii), § 86.078-24(b)(2)(iii), or § 86.078-24(b)(3)(iii) as applicable, giving a full description of the change. Such notification shall be in advance of the change unless the manufacturer elects to follow the procedure described in § 86.078-34.

(b) Based upon the description of the change, and data derived from such testing as the Administrator may require or conduct, the Administrator will determine whether the vehicle (or engine), as modified, would still be covered by the certificate of conformity then in effect.

(c) If the Administrator determines that the outstanding certificate would cover the modified vehicles (or engines) he will notify the manufacturer in writing. Except as provided in § 86.078-34, the change may not be put into effect prior to the manufacturer's receiving this notification. If the Administrator determines that the modified vehicles (or engines) would not be covered by the certificate then in effect, the modified vehicles (or engines) shall be treated as additions to the product line subject to § 86.078-32.

§ 86.078-34 Alternative procedure for notification of additions and changes.

(a) A manufacturer may, in lieu of notifying the Administrator in advance of an addition of a vehicle (or engine) under § 86.078-32 or a change in a vehicle (or engine) under § 86.078-33, notify him concurrently with the making of the change if the manufacturer believes the addition or change will not require any testing under the appropriate section. Upon notification to the Administrator, the manufacturer may proceed to put the addition or change into effect.

(b) The manufacturer may continue to produce vehicles (or engines) as described in the notification to the Administrator for a maximum of 30 days, unless the Administrator grants an extension in writing. This period may be shortened by a notification in accordance with paragraph (c) of this section.

(c) If the Administrator determines, based upon a description of the addition or change, that no test data will be required, he will notify the manufacturer in writing of the acceptability of the addition or change. If the Administrator determines that test data will be required, he will notify the manufacturer to rescind the change within 5 days of receipt of the notification. The Administrator will then proceed as in § 86.078-32 (b) and (c), or § 86.078-33 (b) and (c) as appropriate.

(d) Election to produce vehicles (or engines) under this section will be deemed to be a consent to recall all vehicles (or engines) which the Administrator determines under § 86.078-32(c) do not meet applicable standards, and to cause such nonconformity to be remedied at no expense to the owner.

§ 86.078-35 Labeling.

(a) The manufacturer of any motor vehicle (or motor vehicle engine) subject to the applicable emission standards of this subpart, shall at the time of manufacture, affix a permanent legible label, of the type and in the manner described below, containing the information hereinafter provided, to all production models of such vehicles (or engines) available for sale to the public and covered

by a certificate of conformity under § 86.078-30(a).

(1) *Light-duty vehicles and light-duty trucks.* (i) A permanent legible label shall be affixed in a readily visible position in the engine compartment.

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle, in such a manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals, which shall be of a color that contrasts with the background of the label:

(A) The label heading: Vehicle Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches), engine family identification and evaporative family identification.

(D) Engine tuneup specifications and adjustments, as recommended by the manufacturer in accordance with the altitude at which the vehicle is to be sold to the ultimate purchaser, including but not limited to idle speed(s), ignition timing, the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), high idle speed, initial injection timing, and valve lash (as applicable) as well as other parameters deemed necessary by the manufacturer. These specifications should indicate the proper transmission position during tuneup and what accessories (e.g., air conditioner), if any, should be in operation;

(E) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations which apply to light-duty vehicles or light-duty trucks.

(F) The altitude at which the vehicle is intended for sale to the public as specified by a certificate of conformity under § 86.078-30.

(2) *Gasoline-fueled heavy-duty engines.* (i) A permanent legible label shall be affixed to the engine in a position in which it will be readily visible after installation in the vehicle.

(ii) The label shall be attached to an engine part necessary for normal engine operation and not normally requiring replacement during engine life.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

(A) The label heading: Engine Exhaust Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches) and engine family identification;

(D) Date of engine manufacture (month and year);

(E) Engine tuneup specifications and adjustments as recommended by the

manufacturer, including idle speed, ignition timing, and the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), and valve lash. These specifications should indicate the proper transmission position during tuneup and what accessories (e.g., air conditioner), if any, should be in operation;

(F) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations applicable to gasoline-fueled heavy-duty engines.

(iv) The label may be made up of one or more pieces provided that all pieces are permanently attached to the same engine part.

(3) *Diesel heavy-duty engines.* (i) A permanent legible label shall be affixed to the engine in a position in which it will be readily visible after installation in the vehicle.

(ii) The label shall be attached to an engine part necessary for normal engine operation and not normally requiring replacement during engine life.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

(A) The label heading: Engine Exhaust Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine family identification and model;

(D) Date of engine manufacture (month and year);

(E) Engine specification:

Advertised hp. at r.p.m.

Fuel rate at advertised hp. mm³/stroke.

Valve lash (inches).

Initial injection timing (if adjustable)

(The information applicable to each engine is to be inserted on the appropriate line.)

(F) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations applicable to Diesel heavy-duty engines.

(iv) The label may be made up of one or more pieces provided that all pieces are permanently attached to the same engine or vehicle part as applicable.

(b) The provisions of this section shall not prevent a manufacturer from also reciting on the label that such vehicle (or engine) conforms to any applicable state emission standards for new motor vehicles (or new motor vehicle engines) or any other information that such manufacturer deems necessary for, or useful to, the proper operation and satisfactory maintenance of the vehicle (or engine).

(c) (1) The manufacturer of any light-duty vehicle or light-duty truck subject to the emission standards of this subpart shall, in addition and subsequent to setting forth those statements on the label required by the Department of Transportation (DOT) pursuant to 49 CFR 567.4, set forth, on the DOT label or on an additional label located in proximity to the DOT label and affixed as described in 49 CFR 567.4(b), the follow-

ing information in the English language, lettered in block letters and numerals not less than three thirty-seconds of an inch high, of a color that contrasts with the background of the label:

(i) The Heading: "Vehicle Emission Control Information"

(ii) The Statement: "This Vehicle Conforms to U.S. EPA Regulations Applicable to 1978 Model Year New Motor Vehicles"

(iii) One of the following statements, as applicable, in letters and numerals not less than six thirty-seconds of an inch high and of a color that contrasts with the background of the label:

(A) For all vehicles certified as non-catalyst-equipped: "NON-CATALYST"

(B) For all vehicles certified as catalyst-equipped which are included in a manufacturer's catalyst control program for which approval has been given by the Administrator: "CATALYST—APPROVED FOR IMPORT"

(C) For all vehicles certified as catalyst-equipped which are not included in a manufacturer's catalyst control program for which prior approval has been given by the Administrator: "CATALYST"

(2) In lieu of selecting either of the labeling options of paragraph (c) (1) of this section, the manufacturer may add the information required by paragraph (c) (1) (iii) of this section to the label required by paragraph (a) of this section. The required information will be set forth in the manner prescribed by paragraph (c) (1) (iii).

§ 86.078-36 Submission of vehicle identification numbers.

(a) The manufacturer of any light-duty vehicle or light-duty truck covered by a certificate of conformity under § 86.078-30(a) shall, not later than 60 days after its manufacture, submit to the Administrator the vehicle identification number of such vehicle: *Provided*, That this requirement shall not apply with respect to any vehicle manufactured within any State, as defined in section 302(d) of the Act.

(b) The requirements of this section may be waived with respect to any manufacturer who provides information satisfactory to the Administrator which will enable the Administrator to identify those vehicles which are covered by a certificate of conformity.

§ 86.078-37 Production vehicles and engines.

(a) Any manufacturer obtaining certification under this part shall supply to the Administrator, upon his request, a reasonable number of production vehicles (or engines) selected by the Administrator which are representative of the engines, emission control systems, fuel systems, and transmissions offered and typical of production models available for sale under the certificate. These vehicles (or engines) shall be supplied for testing at such time and place and for such reasonable periods as the Administrator may require. Heavy-duty engines supplied under this paragraph may be required to be mounted in chassis

and appropriately equipped for operation on a chassis dynamometer.

(b) (1) Any manufacturer of light-duty vehicles or light-duty trucks, obtaining certification under this part shall notify the Administrator, on a quarterly basis, of the number of vehicles domestically produced for sale in the United States and the number of vehicles produced and imported for sale in the United States during the preceding quarter. A manufacturer may elect to provide this information every 60 days instead of quarterly, to combine it with the notification required under § 86.078-36. The notification must be submitted 30 days after the close of the reporting period. The vehicle production information required shall be submitted as follows:

(i) Total production volume expressed in terms of units produced.

(ii) Model type production volume, expressed for each model type in terms of units produced and as a percentage of total production.

(iii) Base level production volume, expressed for each base level in terms of units produced and as a percentage of (A) the total production of its respective model type(s) and, (B) total production.

(iv) Vehicle configuration production volume, expressed for each vehicle configuration in terms of units produced, and as a percentage of the total production of its respective base level. In addition, each vehicle configuration shall be identified by its appropriate engine-system combination.

(2) All light-duty vehicles and light-duty trucks covered by a certificate of conformity under § 86.078-30(a) shall be adjusted by the manufacturer to the ignition or injection timing specification detailed in § 86.078-35(a) (1) (iii) (D).

(c) *Heavy-duty engines.* Any heavy-duty engine manufacturer obtaining certification under this part shall notify the Administrator, on a quarterly basis, of the number of engines of each engine family-engine displacement-exhaust emission control system-fuel system combination produced for sale in the United States during the preceding quarter.

(d) The following definitions apply to this section:

(1) "Model type" means a unique combination of car line, basic engine, and transmission class.

(2) "Base level" means a unique combination of basic engine, inertia weight, and transmission class.

(3) "Vehicle configuration" means a unique combination of basic engine, engine code, inertia weight, transmission configuration, and axle ratio within a base level.

§ 86.078-38 Maintenance instructions.

(a) The manufacturer shall furnish or cause to be furnished to the purchaser of each new motor vehicle (or motor vehicle engine) subject to the standards prescribed in §§ 86.078-8 through 86.078-11 as applicable, written instructions for the maintenance and use of the vehicle (or engine) by the purchaser as may be reasonable and necessary to assure the

proper functioning of emission control systems.

(1) Such instructions shall be provided for those vehicle and engine components listed in Appendix VI to this part (and for any other components) to the extent that maintenance of these components is necessary to assure the proper functioning of emission control systems.

(2) Such instructions shall be in clear, and to the extent practicable, nontechnical language.

(b) The maintenance instructions required by this section shall contain a general description of the documentation which the manufacturer will require from the ultimate purchaser or any subsequent purchaser as evidence of compliance with the instructions.

(c) For gasoline-fueled light-duty vehicles and light-duty trucks.

(1) Such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under §§ 86.078-25(a)(2) or 86.078-25(b)(2) as applicable, and shall explain the conditions under which EGR system and catalytic converter maintenance is to be performed (e.g., what type of warning device is being employed and whether the device is activated by component failure or the need for periodic maintenance).

(2) Such instructions shall indicate, for vehicles to be sold to ultimate purchasers at low altitude, what adjustments or modifications, if any, are necessary to allow the vehicle to meet emissions standards at high altitude. The maintenance instructions shall, if applicable, include a statement that the vehicle's emission control system was not designed for conversion to allow the vehicle to meet emissions standards when operated at high altitude.

(3) Such instructions shall indicate, for vehicles to be sold to ultimate purchasers at high altitude, what adjustments or modifications, if any, are necessary to allow the vehicle to meet emissions standards at low altitude. The maintenance instructions shall, if applicable, include a statement that the vehicle's emission control system was not designed for conversion to allow the vehicle to meet emissions standards when operated at low altitude.

(d) For Diesel light-duty vehicles and light-duty trucks.

(1) Such instructions shall indicate, for vehicles to be sold to ultimate purchasers at low altitude, what adjustments or modifications, if any, are necessary to allow the vehicle to meet emissions standards at high altitude. The maintenance instructions shall, if applicable, include a statement that the vehicle's emission control system was not designed for conversion to allow the vehicle to meet emissions standards when operated at high altitude.

(2) Such instructions shall indicate, for vehicles to be sold to ultimate purchasers at high altitude, what adjustments or modifications, if any, are necessary to allow the vehicle to meet emissions standards at low altitude. The maintenance instructions shall, if applicable, include a statement that the ve-

hicle's emission control system was not designed for conversion to allow the vehicle to meet emissions standards when operated at low altitude.

(e) For gasoline-fueled heavy-duty engines, such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under § 86.078-25(c)(2). Scheduled maintenance in addition to that performed on the durability-data engine under § 86.078-25(d)(2) may be recommended for reasons such as to offset the effects of operating conditions which differ from the dynamometer durability cycle or to increase the life of the engine beyond 1500 hours (or the equivalent). The instructions may schedule maintenance on a calendar time basis and/or mileage basis in addition to the engine service time basis that was followed by the manufacturer under § 86.078-25(c)(2).

(f) For Diesel heavy-duty engines, such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under § 86.078-25(d)(2). Scheduled maintenance in addition to that performed on the durability-data engine under § 86.078-25(d)(2) may be recommended for reasons such as to offset the effects of operating conditions which differ from the dynamometer durability cycle or to increase the life of the engine beyond 1,000 hours (or the equivalent). The instructions may schedule maintenance on a calendar time basis, mileage basis, engine service time basis, or combinations of each.

§ 86.078-39 Submission of maintenance instructions.

(a) The manufacturer shall provide to the Administrator, no later than the time of the submission required by § 86.078-23, a copy of the maintenance instructions which the manufacturer proposes to supply to the ultimate purchaser in accordance with § 86.078-38(a). The Administrator will review such instructions to determine whether they are reasonable and necessary to assure the proper functioning of the vehicle's (or engine's) emission control systems. The Administrator will notify the manufacturer of his determination whether such instructions are reasonable and necessary to assure the proper functioning of the emission control systems.

(b) Any revision to the maintenance instructions which will affect emissions shall be supplied to the Administrator at least 30 days before being supplied to the ultimate purchaser unless the Administrator consents to a lesser period of time.

§ 86.079-1 General applicability.

(a) The provisions of this subpart apply to 1979 and later model year new gasoline-fueled and Diesel light-duty vehicles, 1979 and later model year new gasoline-fueled and Diesel light-duty trucks and 1979 and later model year new gasoline-fueled and Diesel heavy-duty engines.

(b) Optional applicability. A manufacturer may request to certify any heavy-duty vehicle 10,000 pounds GVWR or less

as a light-duty truck; heavy-duty vehicle provisions do not apply to such a vehicle.

§ 86.079-2 Definitions.

The following definitions apply beginning with the 1979 model year. Section 86.078-2 remains effective excepting those definitions which are hereby superseded.

"Basic vehicle frontal area" means the area enclosed by the geometric projection of the basic vehicle along the longitudinal axis, which includes tires but excludes mirrors and air deflectors, onto a plane perpendicular to the longitudinal axis of the vehicle.

"Gross vehicle weight rating" means the value specified by the manufacturer as he loaded weight of a single vehicle.

"Heavy-duty vehicle" means any motor vehicle rated at more than 8500 pounds GVWR or that has a vehicle curb weight of more than 6000 pounds or that has a basic vehicle frontal area in excess of 46 square feet.

"Incomplete truck" means any truck which does not have the primary load carrying device or container attached.

"Light-duty truck" means any motor vehicle rated at 8500 pounds GVWR or less which has a vehicle curb weight of 6000 pounds or less and which has a basic vehicle frontal area of 46 square feet or less, which is:

(1) Designed primarily for purposes of transportation of property or is a derivation of such a vehicle, or

(2) Designed primarily for transportation of persons and has a capacity of more than 12 persons, or

(3) Available with special features enabling off-street or off-highway operation and use.

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

"Vehicle curb weight" means the actual or the manufacturer's estimated weight of the vehicle in operational status with all standard equipment, and weight of fuel at nominal tank capacity, and the weight of optional equipment computed in accordance with § 86.078-24; incomplete light-duty trucks shall have vehicle curb weight specified by the manufacturer.

"Van" means a light-duty truck having an integral enclosure, fully enclosing the driver compartment and load carrying device, and having no body sections protruding more than 30 inches ahead of the leading edge of the windshield.

§ 86.079-9 Emission standards for 1979 and later model light-duty trucks.

(a) (1) Exhaust emissions from 1979 and later model year light-duty trucks shall not exceed:

(i) *Hydrocarbons*. 1.7 grams per vehicle mile.

(ii) *Carbon monoxide*. 18 grams per vehicle mile.

(iii) *Oxides of nitrogen*. 2.3 grams per vehicle mile.

(2) The standards set forth in paragraph (a) (1) of this section refer to the exhaust emitted over a driving schedule as set forth in Subpart B and measured and calculated in accordance with those procedures.

(b) (1) Evaporative emissions from 1979 and later model year gasoline-fueled light-duty trucks shall not exceed:

(i) *Hydrocarbons*. 6.0 grams per test.

(2) The standard set forth in paragraph (b) (1) of this section refers to a composite sample of the evaporative emissions collected under the conditions set forth in Subpart B of this part and measured in accordance with those procedures.

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any 1979 and later model year gasoline-fueled light-duty truck.

§ 86.079-20 Incomplete vehicles, classification.

(a) An incomplete truck less than 8500 pounds gross vehicle weight rating shall be classified by the manufacturer as a light-duty truck or as a heavy-duty vehicle. Incomplete light-duty trucks shall be described in the manufacturer's application for certification. The frontal area and curb weight used for certification purposes shall be specified on the label required in § 86.079-35(d). Incomplete heavy-duty trucks must be labeled as required in § 86.079-35(e).

§ 86.079-21 Application for certification.

(a) A separate application for a certificate of conformity shall be made for each set of standards and each class of new motor vehicles or new motor vehicle engines. Such application shall be made to the Administrator by the manufacturer and shall be updated and corrected by amendment.

(b) The application shall be in writing, signed by an authorized representative of the manufacturer, and shall include the following:

(1) Identification and description of the vehicles (or engines) covered by the application and a description of their engine (vehicles only), emission control system, and fuel system components. This shall include a detailed description of each AECID to be installed in or on any certification test vehicle (or certification test engine).

(2) Projected U.S. sales data sufficient to enable the Administrator to select a test fleet representative of the vehicles (or engines) for which certification is requested.

(3) A description of the test equipment and fuel proposed to be used.

(4) (i) A description of the proposed mileage (or service) accumulation procedures for durability testing.

(ii) A description of the test procedures to be used to establish the evaporative emission deterioration factors required to be determined and supplied in § 86.078-23(b) (2).

(5) A statement of recommended maintenance and procedures necessary to assure that the vehicles (or engines) covered by a certificate of conformity in operation conform to the regulations, and a description of the program for training of personnel for such maintenance, and the equipment required.

(6) At the option of the manufacturer, the proposed composition of the emission-data and durability-data test fleet.

(c) Complete copies of the application and of any amendments thereto, and all notifications under §§ 86.078-32, 86.078-33, and 86.078-34 shall be submitted in such multiple copies as the Administrator may require.

(d) Incomplete light-duty trucks shall have a maximum completed curb weight and maximum completed frontal area specified by the manufacturer.

§ 86.079-26 Mileage and service accumulation; emission measurements.

(a) (i) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The procedure for mileage accumulation will be the Durability Driving Schedule as specified in Appendix IV of this part. A modified procedure may also be used if approved in advance by the Administrator. Except with the advance approval of the Administrator, all vehicles will accumulate mileage at a measured curb weight which is within 100 pounds of the estimated curb weight. If the loaded vehicle weight is within 100 pounds of being included in the next higher inertia weight class as specified in § 86.125, the manufacturer may elect to conduct the respective emission tests at the inertia weight corresponding to the higher loaded vehicle weight. Mileage will be accumulated on four wheel drive vehicles in their normal on-highway mode of operation.

(3) *Emission-data vehicles*. Unless as otherwise provided for in § 86.078-23(a), emission-data vehicles shall be operated and tested as follows:

(i) *Gasoline-fueled*. (A) Each gasoline-fueled emission-data vehicle shall be driven 4000 miles with all emission control systems installed and operating. Complete exhaust emission tests shall be conducted at zero and 4000 miles on those vehicles selected under § 86.078-24 (b) (1) (ii) through (b) (1) (v). Complete exhaust and evaporative emission tests shall be conducted at zero miles and 4000 miles on those vehicles selected under § 86.078-24(b) (1) (vi). The manufacturer may at his option test the vehicles selected under § 86.078-24(b) (1) (vii) up to three times at the 4000-mile test point as long as the ± 250 -mile test tolerance is adhered to. The Administrator may determine under § 86.078-24(f) that no testing is required.

(B) The emission-data vehicle(s) selected for testing under § 86.078-24 (b) (1) (v) or (b) (1) (vii) (D) shall be driven 6436 kilometers (4000 miles) at any altitude. Emission tests shall be conducted at zero kilometers (zero miles) at any altitude and 6436 kilometers (4000 miles) under high-altitude conditions.

(C) The emission-data vehicle(s) selected for testing under § 86.078-24 (b) (1) (v) or (b) (1) (vii) (D) and permitted to be tested for purposes of § 86.078-23 (c) (1) (ii) under the provisions of § 86.078-24(b) (1) (vi) shall be driven 6436 kilometers (4000 miles) at low altitude. Emission tests shall be conducted at zero

kilometers (zero miles) at low altitude and 6436 kilometers (4000 miles) under both low- and high-altitude conditions. For the purposes of this subparagraph, "low altitude" means any elevation less than 549 meters (1800 feet).

(ii) *Diesel*. (A) Each Diesel emission-data vehicle shall be driven 6436 kilometers (4000 miles) with all emission control systems installed and operating. Emission tests shall be conducted at zero kilometers (zero miles) and 6436 kilometers (4000 miles).

(B) The emission-data vehicle(s) selected for testing under § 86.078-24 (b) (1) (v) shall be driven 6436 kilometers (4000 miles) at any altitude. Emission tests shall be conducted at zero kilometers (zero miles) at any altitude and 6436 kilometers (4000 miles) under high-altitude conditions.

(C) The emission-data vehicle(s) selected for testing under § 86.078-24 (b) (1) (v) and permitted to be tested for purposes of § 86.078-23(c) (1) (ii) under the provisions of § 86.078-24(b) (1) (vi) shall be driven 6436 kilometers (4000 miles) at low altitude. Emission tests shall be conducted at zero kilometers (zero miles) at low altitude and 6436 kilometers (4000 miles) under both low- and high-altitude conditions. For the purpose of this subparagraph "low altitude" means any elevation less than 549 meters (1800 feet).

(4) *Durability-data vehicles*. Unless as otherwise provided for in § 86.078-23(a), durability-data vehicles shall be operated and tested as follows:

(i) *Gasoline-fueled*. Each gasoline-fueled durability-data vehicle selected by the Administrator or elected by the manufacturer under § 86.078-24 (c) (1) shall be driven, with all emission control systems installed and operating, for 50,000 miles or such lesser distance as the Administrator may agree to as meeting the objective of this procedure. Complete exhaust emission tests shall be made on all durability-data vehicles selected by the Administrator or elected by the manufacturer under § 86.078-24(c) at the following mileage points: 0; 5,000; 10,000; 15,000; 20,000; 25,000; 30,000; 35,000; 40,000; 45,000; 50,000. The Administrator may determine under § 86.078-24(f) that no testing is required.

(ii) *Diesel*. Each Diesel durability-data vehicle shall be driven, with all emission control systems installed and operating, for 50,000 miles or such lesser distance as the Administrator may agree to as meeting the objectives of the procedure. Complete emission tests (see §§ 86.106 through 86.145) shall be made at the following mileage points: 0; 5,000; 10,000; 15,000; 20,000; 25,000; 30,000; 35,000; 40,000; 45,000; 50,000.

(5) All tests required by this subpart to be conducted after every 5,000 miles of driving for durability-data vehicles and 4,000 miles for emission-data vehicles must be conducted at any accumulated mileage within 250 miles of each of those test points.

(6) (i) The results of each emission test shall be supplied to the Administrator immediately after the test. The

manufacturer shall furnish to the Administrator explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided test. If a manufacturer conducts multiple tests at any test point at which the data are intended to be used in the calculation of the deterioration factor, the number of tests must be the same at each point and may not exceed three valid tests. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) shall be air posted to the Administrator within 24 hours (or delivered within 3 working days). In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.078-23. Where the Administrator conducts a test on a durability-data vehicle at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be rounded, using the "Rounding Off Method" specified in ASTM E29-67, to the number of places to the right of the decimal point indicated by expressing the applicable emission standards of this subpart to three significant figures.

(7) Whenever the manufacturer proposes to operate and test a vehicle which may be used for emission or durability data, he shall provide the zero-mile test data to the Administrator (except for those vehicles for which the zero-mile test requirement has been waived under § 86.078-23(a)(2)) and make the vehicle available for such testing under § 86.078-29 as the Administrator may require before beginning to accumulate mileage on the vehicle. Failure to comply with this requirement will invalidate all test data submitted for this vehicle.

(8) Once a manufacturer begins to operate an emission-data or durability-data vehicle, as indicated by compliance with paragraph (a)(7) of this section, he shall continue to run the vehicle to 4,000 miles or 50,000 miles, respectively, and the data from the vehicle will be used in the calculations under § 86.078-28. Discontinuation of a vehicle shall be allowed only with the written consent of the Administrator.

(9) (i) The Administrator may elect to operate and test any test vehicle during all or any part of the mileage accumulation and testing procedure. In such cases, the manufacturer shall provide the vehicle(s) to the Administrator with all information necessary to conduct this testing.

(ii) The test procedures in §§ 86.106 through 86.145 will be followed by the Administrator. The Administrator will test the vehicles at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other vehicles of that combina-

tion to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall be used in the determination of deterioration factors.

(10) Emission testing of any type with respect to any certification vehicle other than that specified in this part is not allowed except as such testing may be specifically authorized by the Administrator.

(11) This section does not apply to testing conducted to meet the requirements of § 86.078-23(b)(2).

(b) (1) Paragraph (b) of this section applies to gasoline-fueled heavy-duty engines.

(2) The engine dynamometer service accumulation schedule will consist of several operating conditions which give the same percentage of time at various manifold vacuums and modes as specified in the emission test cycle. The average speed shall be between 1,650 and 1,700 r.p.m. Subject to the requirements as to average speed, there must be operation at speeds in excess of 3,200 r.p.m. (but not in excess of governed speed for governed engines or rated speed for nongoverned engines) for a cumulative maximum of 0.5 percent of the actual cycle time, excluding time in transient conditions. Maximum cycle time shall be 15 minutes. A cycle approved in advance by the Administrator shall be used.

(3) *Emission-data engines.* Unless as otherwise provided for in § 86.078-23(a), emission-data engines shall be operated and tested as follows: Each emission-data engine shall be operated for 125 hours with all emission control systems installed and operating. Emission tests shall be conducted at zero and 125 hours. Evaporative emission controls need not be connected provided normal operating conditions are maintained in the engine induction system.

(4) *Durability-data engines.* Unless as otherwise provided for in § 86.078-23(a), durability-data engines shall be operated and tested as follows: Each durability-data engine shall be operated with all emission control systems installed and operating, for 1,500 hours. Emission tests shall be conducted at zero hours and at each 125-hour interval. Evaporative emission controls need not be connected provided normal operating conditions are maintained in the engine induction system.

(5) All tests required by this subpart to be conducted after 125 hours of operation or at any multiple of 125 hours may be conducted at any accumulated number of hours within 8 hours of 125 hours or the appropriate multiple of 125 hours, respectively.

(6) (i) The results of each emission test shall be supplied to the Administrator within 72 hours (or delivered within 5 working days). The manufacturer shall furnish to the Administrator an explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the expla-

nation given by the manufacturer for the voided test. If a manufacturer conducts multiple tests at any test point at which the data are intended to be used in the calculation of the deterioration factor, the number of tests must be the same at each point and may not exceed three valid tests. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) shall be air posted to the Administrator within 72 hours (or delivered within 5 working days). In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.078-23. Where the Administrator conducts a test on a durability-data engine at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be recorded and reported to the Administrator using two places to the right of the decimal point. These numbers shall be rounded in accordance with the "Rounding Off Method" specified in ASTM E29-67.

(7) Whenever the manufacturer proposes to operate and test an engine which may be used for emission or durability data, he shall provide the zero-hour test data to the Administrator (except for those engines for which the zero-hour test requirement has been waived under § 86.078-23(a)(2)) and make the engine available for such testing under § 86.078-29 as the Administrator may require, before beginning to accumulate hours on the engine. Failure to comply with this requirement will invalidate all test data later submitted for this engine.

(8) Once a manufacturer begins to operate an emission-data or durability-data engine, as indicated by compliance with paragraph (b)(7) of this section, he shall continue to run the engine to 125 hours or 1,500 hours, respectively, and the data from the engine will be used in the calculations under § 86.078-28. Discontinuation of an engine shall be allowed only with the prior written consent of the Administrator.

(9) (i) The Administrator may elect to operate and test any test engine during all or any part of the service accumulation and testing procedure. In such cases the manufacturer shall provide the engine(s) to the Administrator with all information necessary to conduct the testing.

(ii) The test procedures (§§ 86.777-5 through 86.777-15) will be followed by the Administrator. The Administrator will test the engines at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other engines of that combination to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall

be used in the determination of deterioration factors.

(10) Emission testing of any type with respect to any certification engine other than that specified in this subpart is not allowed except as such testing may be specifically authorized by the Administrator.

(c) (1) Paragraph (c) of this section applies to Diesel heavy-duty engines.

(2) The procedures set forth in this section describe the service accumulation that shall be accomplished on each test engine and when tests are to be conducted.

(3) (i) *Emission-data engines.* Unless as otherwise provided for in § 86.078-23 (a), emission-data engines shall be operated and tested as follows: Each emission-data engine shall be operated for 125 hours with all emission control systems installed and operating. Emission tests shall be conducted at zero and 125 hours.

(ii) *Durability-data engines.* Unless as otherwise provided for in § 86.078-23(a), durability-data engines shall be operated and tested as follows: Each durability-data engine shall be operated, with all emission control systems installed and operating, for 1,000 hours. Emission tests shall be conducted at zero hours and at each 125-hour interval.

(4) A break-in procedure, not to exceed 20 hours, may be run if approved in writing in advance by the Administrator. This procedure would be run after the zero-hour test, and the hours accumulated would not be counted as part of the service accumulation.

(5) Before service accumulation can begin, the following criteria must be met. Failure to comply with these requirements shall invalidate all test data submitted for an engine.

(i) Each engine shall produce at least 95 percent of the maximum horsepower, corrected to rating conditions, at 95 to 100 percent of the rated speed.

(ii) The fuel rate at maximum horsepower shall be within manufacturer's specifications.

(iii) The zero-hour test data shall be provided to the Administrator (except for those engines for which the zero-hour test requirement has been waived under § 86.078-23(a)(2)) and the engine shall be made available for such testing under § 86.078-29 as the Administrator may require.

(6) During service accumulation, hours can be credited toward the required service accumulation hours when the following criteria are met. If these criteria cannot be met, engine operation shall be discontinued and the Administrator shall be notified immediately. (Adjustments to the fuel rate can be approved under the provisions of § 86.078-25).

(i) Each engine shall produce at least 95 percent of the maximum horsepower, at 95 to 100 percent of the rated speed, observed during zero-hour testing. Horsepower values shall be corrected to the rating conditions.

(ii) The engine shall be operated at 75 percent of the inlet and exhaust restrictions specified in § 86.877-8 except

that the tolerance will be ± 3 inches of water and ± 0.5 inches of Hg, respectively.

(7) During each emission test the inlet and exhaust restrictions shall be as specified in § 86.877-8.

(8) Tests, other than zero-hour tests, may be conducted within 8 hours of the nominal test point.

(9) (i) The results of each emission test shall be air posted to the Administrator within 72 hours of test completion (or delivered within 5 working days). The manufacturer shall furnish to the Administrator an explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided tests. If a manufacturer conducts multiple tests (not to exceed three valid tests) at any test point, the number of tests must be the same at each point. The data obtained from all valid tests shall be used in the calculation of the deterioration factor. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) shall be air posted to the Administrator within 72 hours (or delivered within 5 working days). In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.078-23. Where the Administrator conducts a test on a durability-data engine at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be recorded and reported to the Administrator using two places to the right of the decimal point. These numbers shall be rounded in accordance with the "Rounding Off Method" specified in ASTM E29-67.

(10) Once a manufacturer begins to operate an emission-data or durability-data engine, as indicated by compliance with paragraph (c) of this section, he shall continue to run the engine to 125 hours or 1,000 hours respectively, and the data from the engine shall be used in the calculations under § 86.078-28. Discontinuation of an engine shall be allowed only with the prior written consent of the Administrator.

(11) (i) The Administrator may elect to operate and test any test engine during all or any part of the service accumulation and testing procedure. In such cases, the manufacturer shall provide the engine(s) to the Administrator with all information necessary to conduct the testing.

(ii) The test procedures (§§ 86.877-5 through 86.877-14 and §§ 86.977-5 through 86.977-15) will be followed by the Administrator. The Administrator will test the engines at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other engines of that

combination to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall be used in the determination of deterioration factors.

(12) Emission testing of any type with respect to any certification engine other than that specified in this part is not allowed except as such testing may be specifically authorized by the Administrator.

(a) (1) If, after a review of the test reports and data submitted by the manufacturer, data derived from any inspection carried out under § 86.078-7(c) and any other pertinent data or information, the Administrator determines that a test vehicle(s) (or test engine(s)) meets the requirements of the Act and of this subpart, he will issue a certificate of conformity with respect to such vehicle(s) (or engine(s)) except in cases covered by paragraph (c) of this section. If applicable, the certificate will state which vehicles are certified for sale at high altitude.

(2) Such certificate will be issued for such period not to exceed one model year as the Administrator may determine and upon such terms as he may deem necessary to assure that any new motor vehicle (or new motor vehicle engine) covered by the certificate will meet the requirements of the Act and of this part. Each such certificate shall contain the following language:

This certificate covers only those new motor vehicles (or new motor vehicle engines) which conform, in all material respects, to the design specifications that applied to those vehicles (or engines) described in the application for certification and which are produced during the ---- model year production period of the said manufacturer, as defined in 40 CFR § 86.079-2.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR § 86.078-7(c) which concern either the vehicle (or engine) certified, or any production vehicle (or production engine) covered by this certificate, or any production vehicle (or production engine) which when completed will be claimed to be covered by this certificate. Failure to comply with all the requirements of § 86.078-7(c) with respect to any such vehicle (or engine) may lead to revocation or suspension of this certificate as specified in 40 CFR § 86.079-30(c). It is also a term of this certificate that this certificate may be revoked or suspended for the other reasons stated in § 86.079-30 (c) or (d).

(3) One such certificate will be issued for each engine family and will certify compliance with no more than one set of applicable standards except that for gasoline-fueled light-duty vehicles and light-duty trucks, one such certificate will be issued for each engine family- evaporative emission family combination and will certify compliance with no more than one set of applicable standards.

(4) A violation of section 203(a)(1) of the Clean Air Act occurs when any manufacturer sells, offers for sale, introduces or delivers for introduction into commerce, any light-duty vehicle or

light-duty truck, subject to the regulations under the Act, which is not covered by a certificate of conformity at high altitude issued under this part:

(1) At a designated high-altitude location, unless such manufacturer has substantial reason to believe that such motor vehicle will not be sold to an ultimate purchaser for principal use at a designated high-altitude location; or,

(2) At an other than a designated high-altitude location, when such manufacturer has reason to believe that such motor vehicle is intended by the ultimate purchaser to be used principally at a designated high-altitude location.

(3) For the purpose of paragraph (a) of this section, "designated high-altitude location" is any county which has substantially all of its area located above 1219 meters (4,000 feet) and which is identified below.

COUNTIES LOCATED SUBSTANTIALLY ABOVE 1,219 METERS (4,000 FEET) IN ELEVATION

STATE OF ARIZONA

Apache Navajo

STATE OF COLORADO

Adams Jefferson
 Alamosa Lake
 Arapahoe La Plata
 Archuleta Larimer
 Boulder Las Animas
 Chaffee Lincoln
 Clear Creek Mesa
 Conejos Mineral
 Costilla Moffat
 Crowley Montezuma
 Custer Montrose
 Dolores Morgan
 Delta Ouray
 Denver Park
 Douglas Pitkin
 Eagle Pueblo
 Elbert Rio Blanco
 El Paso Rio Grande
 Fremont Routt
 Garfield Saguache
 Gilpin San Juan
 Grand San Miguel
 Gunnison Summit
 Hinsdale Teller
 Huerfano Washington
 Jackson Weld

STATE OF IDAHO

Bannock Custer
 Bear Lake Franklin
 Blaine Fremont
 Bonneville Jefferson
 Butte Madison
 Camas Minidoka
 Caribou Oneida
 Cassia Power
 Clark Teton
 Valley

STATE OF MONTANA

Beverhead Madison
 Deer Lodge Meagher
 Gallatin Park
 Jefferson Silver Bow

STATE OF NEBRASKA

Banner Sioux
 Kimball

STATE OF NEVADA

Carson City Lander
 Douglas Lyon
 Elko Mineral
 Emeralds Storey
 Eureka White Pine
 Humboldt

Bernalillo
 Catron
 Colfax
 Curry
 De Baca
 Grant
 Guadalupe
 Harding
 Lincoln
 Los Alamos
 Luna
 McKinley

STATE OF NEW MEXICO

Mora
 Rio Arriba
 Sandoval
 San Juan
 San Miguel
 Santa Fe
 Sierra
 Socorro
 Taos
 Torrance
 Union
 Valencia

STATE OF OREGON

Lake

STATE OF UTAH

Beaver Plute
 Box Elder Rich
 Cache Salt Lake
 Carbon San Juan
 Daggett Sanpete
 Davis Sevier
 Duchesne Summit
 Emery Tooele
 Grand Uintah
 Iron Utah
 Juab Wasatch
 Kane Wayne
 Millard Weber
 Morgan

STATE OF WYOMING

Albany Natrona
 Carbon Niobrara
 Converse Park
 Fremont Platte
 Goshen Sublette
 Hot Springs Sweetwater
 Johnson Teton
 Laramie Uinta
 Lincoln Weston

(6) The provisions of paragraph (a) (4) of this section shall not apply to any light-duty vehicle or light-duty truck, sold, offered for sale, introduced, or delivered for introduction into commerce in California, provided that the vehicle is covered by a certificate of conformity with emission standards in effect in California.

(7) Certificates issued for light-duty vehicles or light-duty trucks certified with catalytic converters shall be subject to the following term in addition to the term in paragraph (a) (2) of this section: "Catalyst-equipped vehicles, otherwise covered by this certificate, which are driven outside the United States, Canada, and Mexico will be presumed to have been operated on leaded gasoline resulting in deactivation of the catalysts. If these vehicles are imported or offered for importation without retrofit of the catalyst, they will be considered not to be within the coverage of this certificate unless included in a catalyst control program operated by a manufacturer or a United States Government Agency and approved by the Administrator."

(8) Certificates issued for incomplete light-duty trucks shall be subject to the following term in addition to the term in paragraph (a) (2) of this section: "For incomplete light-duty trucks, this certificate covers only those new motor vehicles which when completed by having the primary load carry device or container attached, conform to the maximum curb weight and frontal area limitations described in the application for certification as required in 40 CFR 86.079-21(d)."

(9) Certificates issued for heavy-duty engines shall be subject to the following term in addition to the term in paragraph (a) (2) of this section: "For heavy-duty engines, this certificate covers only those new motor vehicle engines installed in heavy-duty vehicles which conform to the minimum gross vehicle weight rating, curb weight, or frontal area limitations for heavy-duty vehicles described in 40 CFR 86.079-2."

(b) (1) The Administrator will determine whether a vehicle (or engine) covered by the application complies with applicable standards by observing the following relationships:

(i) Light-duty vehicles and light-duty trucks.

(A) The durability-data vehicle(s) selected under § 86.078-24(c) (1) (i) shall represent all vehicles of the same engine-system combination.

(B) The emission-data vehicle(s) selected under § 86.078-24 (b) (1) (ii), (b) (1) (iii), and (b) (1) (iv) shall represent all vehicles of the same engine-system combination as applicable to be sold below 4000 ft.

(C) The emission-data vehicle(s) selected under § 86.078-24 (b) (1) (vii) (A) and (b) (1) (vii) (B) shall represent all vehicles of the same evaporative control system within the evaporative family, as applicable, to be sold below 4000 ft.

(D) The emission-data vehicle(s) selected under § 86.078-24(b) (1) (v) shall represent all vehicles of the same engine-system combination to be sold at high altitude.

(E) The emission-data vehicle(s) selected under § 86.078-24(b) (1) (vii) (D) shall represent all vehicles of the same evaporative control system within the evaporative family sold at high altitude.

(i) Gasoline-fueled heavy-duty engines.

(A) A test engine selected under § 86.078-24(b) (2) (ii) and (iv) shall represent all engines in the same engine family of the same engine displacement-exhaust emission control system combination.

(B) A test engine selected under § 86.078-24(b) (2) (iii) shall represent all engines in the same engine family of the same engine displacement-exhaust emission control system combination.

(C) A test engine selected under § 86.078-24(c) (2) (i) shall represent all engines of the same engine-system combination.

(iii) Diesel heavy-duty engines.

(A) A test engine selected under § 86.078-24(b) (3) (ii) shall represent all engines in the same engine-system combination.

(B) A test engine selected under § 86.078-24(b) (3) (iii) shall represent all engines of that emission control system at the rated fuel delivery of the test engine.

(C) A test engine selected under § 86.078-24(c) (3) (i) shall represent all engines of the same engine-system combination.

(2) The Administrator will proceed as in paragraph (a) of this section with respect to the vehicles (or engines) be-

longing to an engine family or engine family-evaporative emission family combination (as applicable), all of which comply with all applicable standards.

(3) If, after a review of the test reports and data submitted by the manufacturer, data derived from any additional testing conducted pursuant to § 86.078-29, data or information derived from any inspection carried out under § 86.078-7(c) or any other pertinent data or information, the Administrator determines that one or more test vehicles (or test engines) of the certification test fleet do not meet applicable standards, he will notify the manufacturer in writing, setting forth the basis for his determination. Within 30 days following receipt of the notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's determination and data in support of such objections. If, after a review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078-6 with respect to such issue.

(4) For light-duty vehicles and light-duty trucks the manufacturer may, at his option, proceed with any of the following alternatives with respect to an emission-data vehicle determined not in compliance with all applicable standards for which it was tested:

(i) Request a hearing under § 86.078-6; or

(ii) Remove the vehicle configuration (or evaporative vehicle configuration, as applicable) which failed, from his application:

(A) If the failed vehicle was tested for compliance with exhaust emission standards only: The Administrator may select, in place of the failed vehicle, in accordance with the selection criteria employed in selecting the failed vehicle, a new emission-data vehicle to be tested for exhaust emission compliance only.

(B) If the failed vehicle was tested for compliance with both exhaust and evaporative emission standards: The Administrator may select, in place of the failed vehicle, in accordance with the selection criteria employed in selecting the failed vehicle, a new emission-data vehicle which will be tested for compliance with both exhaust and evaporative emission standards. If one vehicle cannot be selected in accordance with the selection criteria employed in selecting the failed vehicle, then two vehicles may be selected (i.e., one vehicle to satisfy the exhaust emission vehicle selection criteria and one vehicle to satisfy the evaporative emission vehicle selection criteria). The vehicle selected to satisfy the exhaust emission vehicle selection criteria will be tested for compliance with exhaust emission standards only. The vehicle selected to satisfy the evaporative emission vehicle selection criteria will be tested for compliance with both exhaust and evaporative emission standards; or

(iii) Remove the vehicle configuration (or evaporative vehicle configuration, as applicable) which failed from his application and add a vehicle configuration(s) (or evaporative vehicle configuration(s), as applicable) not previously listed. The Administrator may require, if applicable, that the failed vehicle be modified to the new engine code (or evaporative emission code, as applicable) and demonstrate by testing that it meets applicable standards for which it was originally tested. In addition, the Administrator may select, in accordance with the vehicle selection criteria given in § 86.078-24(b), a new emission-data vehicle or vehicles. The vehicles selected to satisfy the exhaust emission vehicle selection criteria will be tested for compliance with exhaust emission standards only. The vehicles selected to satisfy the evaporative emission vehicle selection criteria will be tested for compliance with both exhaust and evaporative emission standards; or

(iv) Correct a component or system malfunction and show that with a correctly functioning system or component the failed vehicle meets applicable standards for which it was originally tested. The Administrator may require a new emission-data vehicle, of identical vehicle configuration (or evaporative vehicle configuration as applicable) to the failed vehicle, to be operated and tested for compliance with the applicable standards for which the failed vehicle was originally tested.

(5) For heavy-duty engines the manufacturer may, at his option, proceed with any of the following alternatives with respect to any engine family represented by a test engine(s) determined not in compliance with applicable standards:

(i) Request a hearing under § 86.078-6; or

(ii) Delete from the application for certification the engines represented by the failing test engine. (Engines so deleted may be included in a later request for certification under § 86.078-32.) The Administrator will then select in place of each failing engine an alternate engine chosen in accordance with selection criteria employed in selecting the engine that failed; or

(iii) Modify the test engine and demonstrate by testing that it meets applicable standards. Another engine which is in all material respects the same as the first engine, as modified, shall then be operated and tested in accordance with applicable test procedures.

(6) If the manufacturer does not request a hearing or present the required data under paragraphs (b) (4) or (b) (5) (as applicable) of this section, the Administrator will deny certification.

(c) (1) Notwithstanding the fact that any certification vehicle(s) (or certification engine(s)) may comply with other provisions of this subpart, the Administrator may withhold or deny the issuance of a certificate of conformity (or suspend or revoke any such certificate which has been issued) with respect to any such vehicle(s) (or engine(s)) if:

(i) The manufacturer submits false or incomplete information in his application for certification thereof;

(ii) The manufacturer renders inaccurate any test data which he submits pertaining thereto.

(iii) Any EPA Enforcement Officer is denied access on the terms specified in § 86.078-7(c) to any facility or portion thereof which contains any of the following:

(A) The vehicle (or engine);

(B) Any components used or considered for use in its modification or build up into a certification vehicle (or certification engine);

(C) Any production vehicle (or production engine), which is or will be claimed by the manufacturer to be covered by the certificate;

(D) Any step in the construction of a vehicle (or engine) described in (C) of this subdivision;

(E) Any records, documents, reports, or histories required by this part to be kept concerning any of the above.

(iv) Any EPA Enforcement Officer is denied "reasonable assistance" (as defined in § 86.078-7(c)) in examining any of the items listed in paragraph (c) (1) (iii) of this section.

(2) The sanctions of withholding, denying, revoking, or suspending of a certificate may be imposed for the reasons in paragraphs (c) (1) (i), (ii), (iii), or (iv) of this section only when the infraction is substantial.

(3) In any case in which a manufacturer knowingly submits false or inaccurate information or knowingly renders inaccurate or invalid any test data or commits any other fraudulent acts and such acts contribute substantially to the Administrator's decision to issue a certificate of conformity, the Administrator may deem such certificate void ab initio.

(4) In any case in which certification of a vehicle (or engine) is proposed to be withheld, denied, revoked, or suspended under paragraph (c) (1) (iii), or (c) (1) (iv) of this section, and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.078-7(c) in fact occurred, the manufacturer, if he wishes to contend that, even though the violation occurred, the vehicle (or engine) in question was not involved in the violation to a degree that would warrant withholding denial, revocation, or suspension of certification under either paragraph (c) (1) (iii) or (c) (1) (iv) of this section, shall have the burden of establishing that contention to the satisfaction of the Administrator.

(5) Any revocation or suspension of certification under paragraph (c) (1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.078-6 hereof.

(ii) Extend no further than to forbid the introduction into commerce of vehicles (or engines) previously covered by certification which are still in the hands of the manufacturer, except in cases of

such fraud or other misconduct as makes certification invalid ab initio.

(6) The manufacturer may request in the form and manner specified in paragraph (b) (3) of this section that any determination made by the Administrator under paragraph (c) (1) of this section to withhold or deny certification be reviewed in a hearing conducted in accordance with § 86.078-6. If the Administrator finds, after a review of the request and supporting data, that the request raises a substantial factual issue he will grant the request with respect to such issue.

(d) (1) For light-duty vehicles and light-duty trucks, notwithstanding the fact that any vehicle configuration or engine family may be covered by a valid outstanding certificate of conformity, the Administrator may suspend such outstanding certificate of conformity in whole or in part with respect to such vehicle configuration or engine family if:

(i) The manufacturer refuses to comply with the provisions of a test order issued by the Administrator pursuant to § 86.603; or

(ii) The manufacturer refuses to comply with any of the requirements of § 86.603; or

(iii) The manufacturer submits false or incomplete information in any report or information provided pursuant to the requirements of § 86.609; or

(iv) The manufacturer renders inaccurate any test data which he submits pursuant to § 86.609; or

(v) Any EPA Enforcement Officer is denied access to a facility on the terms specified in § 86.606.

(vi) Any EPA Enforcement Officer is denied the opportunity on the terms specified in § 86.606 to

(A) Monitor vehicle selection pursuant to § 86.607.

(B) Select vehicles for testing pursuant to § 86.607, or

(C) Monitor vehicle testing performed to satisfy any of the requirements of this part; or

(vii) Any EPA Enforcement Officer is denied "reasonable assistance" as defined in § 86.606 in examining any of the items listed in that section; or

(viii) The manufacturer refuses to comply with the requirements of §§ 86.604(a), 86.605, 86.607, 86.608, 86.610, or 86.611.

(2) The sanction of suspending a certificate may not be imposed for the reasons in paragraphs (d) (1) (i), (ii) or (viii) of this section where such refusal is caused by conditions and circumstances outside the control of the manufacturer which renders it impossible to comply with those requirements. Such conditions and circumstances shall include, but are not limited to, any uncontrollable factors which result in the temporary unavailability of equipment and personnel needed to conduct the required tests, such as equipment breakdown or failure or illness of personnel, but shall not include failure of the manufacturer to adequately plan for and provide the equipment and personnel needed to conduct the tests. The manufacturer will bear the burden of establishing the

presence of the conditions and circumstances required by this paragraph.

(3) The sanctions of suspending a certificate may be imposed for the reasons in paragraphs (d) (1), (iii), (iv), (v), (vi), (vii) of this section only when the infraction is substantial.

(4) In any case in which a manufacturer knowingly submitted false or inaccurate information or knowingly rendered inaccurate any test data or committed any other fraudulent acts, and such acts contributed substantially to the Administrator's original decision not to suspend or revoke a certificate of conformity in whole or in part, the Administrator may deem such certificate void from the date of such fraudulent act.

(5) In any case in which certification of a vehicle is proposed to be suspended under paragraph (d) (1) (v), (d) (1) (vi), or (d) (1) (vii) of this section, and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.606 in fact occurred, the manufacturer, if he wishes to contend that, even though the violation occurred, the vehicle configuration or engine family in question was not involved in the violation to a degree that would warrant suspension of certification under either paragraph (d) (1) (v), (d) (1) (vi), or (d) (1) (vii) of this section, shall have the burden of establishing that contention to the satisfaction of the Administrator.

(6) Any suspension of certification under paragraph (d) (1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.613 hereof and

(ii) Not apply to vehicles no longer in the hands of the manufacturer.

§ 86.079-35 Labeling.

(a) The manufacturer of any motor vehicle (or motor vehicle engine) subject to the applicable emission standards of this subpart, shall at the time of manufacture, affix a permanent legible label, of the type and in the manner described below, containing the information hereinafter provided, to all production models of such vehicles (or engines) available for sale to the public and covered by a certificate of conformity under § 86.078-30(a).

(1) *Light-duty vehicles and light-duty trucks.* (i) A permanent legible label shall be affixed in a readily visible position in the engine compartment.

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle, in such a manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals, which shall be of a color that contrasts with the background of the label:

(A) The label heading: Vehicle Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches), engine family identification and evaporative family identification.

(D) Engine tuneup specifications and adjustments, as recommended by the manufacturer in accordance with the altitude at which the vehicle is to be sold to the ultimate purchaser, including but not limited to idle speed(s), ignition timing, the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), high idle speed, initial injection timing, and valve lash (as applicable) as well as other parameters deemed necessary by the manufacturer. These specifications should indicate the proper transmission position during tuneup and what accessories (e.g., air conditioner), if any, should be in operation;

(E) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations which apply to light-duty vehicles or light-duty trucks.

(F) The altitude at which the vehicle is intended for sale to the public as specified by a certificate of conformity under § 86.078-30.

(2) *Gasoline-fueled heavy-duty engines.* (i) A permanent legible label shall be affixed to the engine in a position in which it will be readily visible after installation in the vehicle.

(ii) The label shall be attached to an engine part necessary for normal engine operation and not normally requiring replacement during engine life.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

(A) The label heading: Engine Exhaust Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches) and engine family identification;

(D) Date of engine manufacture (month and year);

(E) Engine tuneup specifications and adjustments as recommended by the manufacturer, including idle speed, ignition timing, and the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), and valve lash. These specifications should indicate the proper transmission position during tuneup and what accessories (e.g., air conditioner), if any, should be in operation;

(F) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations applicable to gasoline-fueled heavy-duty engines.

(iv) The label may be made up of one or more pieces provided that all pieces are permanently attached to the same engine part.

(3) *Diesel heavy-duty engines.* (i) A permanent legible label shall be affixed to the engine in a position in which it will be readily visible after installation in the vehicle.

(ii) The label shall be attached to an engine part necessary for normal engine operation and not normally requiring replacement during engine life.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

(A) The label heading: Engine Exhaust Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine family identification and model;

(D) Date of engine manufacture (month and year);

(E) Engine specification:

Advertised hp. at r.p.m.
Fuel rate at advertised hp. mm³/stroke.
Valve lash (inches).
Initial injection timing (if adjustable)
(The information applicable to each engine is to be inserted on the appropriate line.)

(F) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations applicable to Diesel heavy-duty engines.

(iv) The label may be made up of one or more pieces provided that all pieces are permanently attached to the same engine or vehicle part as applicable.

(b) The provisions of this section shall not prevent a manufacturer from also reciting on the label that such vehicle (or engine) conforms to any applicable state emission standards for new motor vehicles (or new motor vehicle engines) or any other information that such manufacturer deems necessary for, or useful to, the proper operation and satisfactory maintenance of the vehicle (or engine).

(c) (1) The manufacturer of any light-duty vehicle or light-duty truck subject to the emission standards of this subpart shall, in addition and subsequent to setting forth those statements on the label required by the Department of Transportation (DOT) pursuant to 49 CFR 567.4 set forth on the DOT label or on an additional label located in proximity to the DOT label and affixed as described in 49 CFR 567.4(b), the following information in the English language, lettered in block letters and numerals not less than three thirty-seconds of an inch high, of a color that contrasts with the background of the label:

(i) The Heading: "Vehicle Emission Control Information"

(ii) The Statement: "This Vehicle Conforms to U.S. EPA Regulations Applicable to 1978 Model Year New Motor Vehicles"

(iii) One of the following statements, as applicable, in letters and numerals not less than six thirty-seconds of an inch high and of a color that contrasts with the background of the label:

(A) For all vehicles certified as non-catalyst-equipped: "NON-CATALYST"

(B) For all vehicles certified as catalyst-equipped which are included in a manufacturer's catalyst control program for which approval has been given by the Administrator: "CATALYST—APPROVED FOR IMPORT"

(C) For all vehicles certified as catalyst-equipped which are not included in a manufacturer's catalyst control program for which prior approval has been given by the Administrator: "CATALYST"

(2) In lieu of selecting either of the labeling options of paragraph (c) (1) of this section, the manufacturer may add the information required by paragraph (c) (1) (iii) of this section to the label required by paragraph (a) of this section. The required information will be set forth in the manner prescribed by paragraph (c) (1) (iii).

(d) Incomplete light-duty trucks and incomplete heavy-duty vehicles optionally certified as light duty trucks shall have the following statement printed on the label required in paragraph (a) (1) of this section in lieu of the statement required by (a) (1) (iii) (E) of this section: "This vehicle conforms to U.S. EPA regulations applicable to 19... Model Year New Motor Vehicles when completed at a maximum curb weight of ... pounds and a maximum frontal area of ... square feet."

(e) Incomplete heavy-duty vehicles having an 8500 pound gross vehicle weight rating or less shall have the following statement printed on the label required in paragraph (a) (2) or (a) (3) of this section in lieu of the statement required by paragraph (a) (2) (iii) F or (a) (3) (iii) F of this section: "This engine conforms to U.S. EPA regulations applicable to 19... Model Year New Heavy Duty Engines when installed in a vehicle completed at a curb weight of more than 6000 pounds or with a frontal area greater than 46 square feet."

(f) The manufacturer of any incomplete vehicle shall notify the purchaser of such vehicle of any curb weight, frontal area or gross vehicle weight rating limitations affecting the emissions certificate applicable to that vehicle. This notification shall be transmitted in a manner consistent with NHTSA safety notification requirements published in 40 CFR 568.

Subpart B—Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles and New Light-Duty Trucks; Test Procedures.

§ 86.101 General applicability.

(a) The provisions of this subpart are applicable to 1977 and later model year new light-duty vehicles and light-duty trucks.

(1) Sections 86.101 through 86.145-78 apply for 1978 and later model years.

(2) Sections 86.177-4 through 86.177-23 apply for the 1977 model year only.

(b) Provisions of this subpart apply to tests performed by both the Administrator and motor vehicle manufacturers.

§ 86.102 Definitions.

The definitions in §§ 86.077-2 and 86.078-2 apply to this subpart.

§ 86.103 Abbreviations.

The abbreviations in § 86.078-3 apply to this subpart.

§ 86.104-78 Section numbering; construction.

(a) The model year of initial applicability is indicated by the section number. The two digits following the hyphen designate the first model year for which a section is effective. A section remains effective until superseded.

Example. Section 86.111-78 applies to the 1978 and subsequent model years until superseded. If a § 86.111-81 is promulgated it would take effect beginning with the 1981 model year; § 86.111-78 would apply to model years 1978 through 1980.

(b) Unless indicated otherwise, all provisions in this subpart apply to both gasoline-fueled and Diesel vehicles.

§ 86.105-78 Introduction; structure of subpart.

(a) This subpart describes the equipment required and the procedures to follow in order to perform exhaust and evaporative emission tests on light-duty vehicles and light-duty trucks. Subpart A sets forth the testing requirements and test intervals necessary to comply with EPA certification procedures.

(b) Three topics are addressed in this subpart. Sections 86.106 through 86.115 set forth specifications and equipment requirements; §§ 86.116 through 86.126 discuss calibration methods and frequency; test procedures and data requirements are listed (in approximate order of performance) in §§ 86.127 through 86.145.

§ 86.106-78 Equipment required; overview.

(a) This subpart contains procedures for both exhaust and evaporative emissions tests on Diesel or gasoline-fueled light-duty vehicles and light-duty trucks. Certain items of equipment are not necessary for a particular test, e.g., evaporative enclosure when testing Diesel vehicles. Equipment required and specifications are as follows:

(1) *Evaporative emission tests; gasoline-fueled vehicles.* The evaporative emission test is closely related to and connected with the exhaust emission test. All vehicles tested for evaporative emissions must be tested for exhaust emissions. Further, unless the evaporative emission test is waived by the Administrator under § 86.078-26, all gasoline-fueled vehicles must undergo both tests. (Diesel vehicles are excluded from the evaporative emission standard.) Section 86.107 specifies the necessary equipment.

(2) *Exhaust emission tests.* All vehicles subject to this subpart are tested for exhaust emissions. Diesel and gasoline-fueled vehicles are tested identically with the exception of hydrocarbon measurements; Diesel vehicles require a heated hydrocarbon detector, § 86.109. All gasoline-fueled vehicles are either tested for evaporative emissions or undergo a diurnal heat build. Diesel vehicles are excluded from this requirement. Equipment necessary and specifications appear in §§ 86.108 through 86.114.

(3) *Fuel, analytical gas, and driving schedule specifications.* Fuel specifications for exhaust and evaporative emis-

sion testing and for mileage accumulation for gasoline-fueled and Diesel vehicles are specified in § 86.113. Analytical gases are specified in § 86.114. The EPA Urban Dynamometer Driving Schedule for use in exhaust testing is specified in § 86.115 and Appendix I.

§ 86.107-78 Sampling and analytical system; evaporative emissions.

(a) Component description (evaporative emissions sampling system). The following components will be used in evaporative emissions sampling systems for testing under this subpart.

(1) *Evaporative emission measurement enclosure.* The enclosure shall be readily sealable, rectangular in shape, with space for personnel access to all sides of the vehicle. When sealed, the enclosure shall be gas tight in accordance with § 86.117. Interior surfaces must be impermeable to hydrocarbons. One surface should be of flexible, impermeable material to allow for minor volume changes, resulting from temperature changes. Wall design should promote maximum dissipation of heat, and if artificial cooling is used, interior surface temperatures shall not be less than 68° F (20° C).

(2) *Evaporative emission hydrocarbon analyzers.* A hydrocarbon analyzer utilizing the hydrogen flame ionization principle (FID) shall be used to monitor the atmosphere within the enclosure. Instrument bypass flow may be returned to the enclosure. The FID shall have a response time to 90 percent of final reading of less than 1.5 seconds, and be capable of meeting performance requirements expressed as a function of $C_{10,14}$: where $C_{10,14}$ is the specific enclosure hydrocarbon level, in ppm, corresponding to the evaporative emission standard:

(i) Stability of the analyzer shall be better than 0.01 $C_{10,14}$ ppm at zero and span over a 15-minute period on all ranges used.

(ii) Repeatability of the analyzer, expressed as one standard deviation, shall be better than 0.005 $C_{10,14}$ ppm on all ranges used.

(3) *Evaporative emission hydrocarbon data recording system.* The electrical output of the FID shall be recorded at least at the initiation and termination of each diurnal or hot soak. The recording may be by means of a strip chart potentiometric recorder, by use of an on-line computer system or other suitable means. In any case, the recording system must have operational characteristics (signal to noise ratio, speed of response, etc.) equivalent to or better than those of the signal source being recorded, and must provide a permanent record of results. The record shall show a positive indication of the initiation and completion of each diurnal or hot soak along with the time elapsed between initiation and completion of each soak.

(4) *Tank fuel heating system.* The tank fuel heating system shall consist of a heat source and a temperature controller. A typical heat source is a 2000 W heating pad. Other sources may be

used as required by circumstances. The temperature controller may be manual, such as a variable voltage transformer, or may be automated. The heating system must not cause hot spots on the tank wetted surface which could cause local overheating of the fuel. Heat must not be applied to the vapor in the tank above the liquid fuel. The temperature controller must be capable of controlling the fuel tank temperature during the diurnal soak to within $\pm 3^\circ\text{F}$ (1.7°C) of the following equation:

$$F = T_s + 0.4 t$$

or for SI units:

$$C = T_s + (2/9) t$$

Where:

F = Temperature in °F
C = Temperature in °C
t = Time since start of test in minutes.
 T_s = Initial temperature

(5) *Temperature recording system.* Strip chart recorder(s) or automatic data processor shall be used to record enclosure ambient and vehicle fuel tank temperature during the evaporative emissions test. The temperature recorder or data processor shall record each temperature at least once every minute. The recording system shall be capable of resolving time to $\pm 15\text{s}$ and capable of resolving temperature to $\pm 0.75^\circ\text{F}$ (0.42°C). The temperature recording system (recorder and sensor) shall have an accuracy of $\pm 3^\circ\text{F}$ (1.7°C). The recorder (data processor) shall have a time accuracy of $\pm 15\text{s}$ and a precision of $\pm 15\text{s}$. Two ambient temperature sensors, connected to provide one average output, shall be located in the enclosure. These sensors shall be located at the approximate vertical centerline of each side wall extending 4 inches (nominally) into the enclosure at a height of $3 \pm 0.5\text{ ft}$ ($0.9 \pm 0.2\text{ m}$). The vehicle fuel tank temperature sensor shall be located in the fuel tank so as to measure the temperature of the prescribed test fuel at the approximate mid-volume of the fuel. Manufacturers shall arrange that vehicles furnished for testing at Federal certification facilities be equipped with iron-constantan Type J thermocouples for measurement of fuel tank temperature.

(6) *Purge blower.* One or more portable or fixed blowers shall be used to purge the enclosure. The blowers shall have sufficient flow capacity to reduce the enclosure hydrocarbon concentration from the test level to the ambient level between tests. Actual flow capacity will depend upon the time available between tests.

(7) *Mixing blower.* One or more small blowers or fans with a total capacity of 200 to 1000 cfm shall be used to mix the contents of the enclosure during evaporative emission testing. No portion of the air stream shall be directed towards the vehicle. Maintenance of uniform concentrations throughout the enclosure is important to the accuracy of the test.

§ 86.108-78 Dynamometer.

The dynamometer shall have a power absorption unit for simulation of road load power and flywheels or other means of simulating the inertia weight as specified in § 86.129.

§ 86.109-78 Exhaust gas sampling system.

(a) (1) *General.* The exhaust gas sampling system is designed to measure the true mass emissions of vehicle exhaust. In the CVS concept of measuring mass emissions, two conditions must be satisfied; the total volume of the mixture of exhaust and dilution air must be measured, and a continuously proportioned sample of volume must be collected for analysis. Mass emissions are determined from the sample concentration and totalized flow over the test period.

(2) *Positive Displacement Pump.* The Positive Displacement Pump-Constant Volume Sampler (PDP-CVS), Figure B78-1, satisfies the first condition by metering at a constant temperature and pressure through the pump. The total volume is measured by counting the revolutions made by the calibrated positive displacement pump. The proportional sample is achieved by sampling at a constant flow rate.

(3) *Critical Flow Venturi.* The operation of the Critical Flow Venturi-Constant Volume Sample (CFV-CVS), Figure B78-2, is based upon the principles of fluid dynamics associated with critical flow. Proportional sampling throughout temperature excursions is maintained by use of a small CFV in the sample line. The variable mixture flow rate is maintained at sonic velocity, which is directly proportional to the square root of the gas temperature, and is computed continuously. Since the pressure and temperature are the same at both venturi inlets, the sample volume is proportional to the total volume.

(4) *Diesel sampling.* Diesel vehicles require a heated flame ionization detector (HFID) for hydrocarbon analysis. The sample must be taken as close as practical to the mixing point of the dilution air and exhaust sample. The HFID, by design, draws its sample at a constant flow rate. Unless compensation for varying flow is made the HFID must be used with a constant flow system to insure a representative sample.

(5) *Other systems.* Other sampling systems may be used if shown to yield equivalent results, and if approved in advance by the Administrator (e.g., a heat exchanger with the CFV-CVS; an electronic flow integrator without a heat exchanger, with the PDP-CVS; or, for Diesel HC measurements, an electronic flow compensator with the CFV-CVS).

(b) *Component description, PDP-CVS.* The PDP-CVS, Figure B78-1, consists of a dilution air filter and mixing assembly, heat exchanger, positive displacement pump, sampling system, and associated valves, pressure and temperature sensors. The PDP-CVS shall conform to the following requirements:

(1) Static pressure variations at the tailpipe(s) of the vehicle shall remain within ± 5 inches of water (1.2 kPa) of the static pressure variations measured during a dynamometer driving cycle with no connection to the tailpipe(s). (Sampling systems capable of maintaining the static pressure to within ± 1 inch of water (0.25 kPa) will be used by the Administrator if a written request substantiates the need for this closer tolerance.)

(2) The gas mixture temperature, measured at a point immediately ahead of the positive displacement pump, shall be within $\pm 10^\circ\text{F}$ (5.6°C) of the designed

operating temperature at the start of the test. The gas mixture temperature variation from its value at the start of the test shall be limited to $\pm 10^\circ\text{F}$ (5.6°C) during the entire test. The temperature measuring system shall have an accuracy and precision of $\pm 2^\circ\text{F}$ (1.1°C).

(3) The pressure gauges shall have an accuracy and precision of ± 3 mm Hg (0.4 kPa).

(4) The flow capacity of the CVS shall be large enough to eliminate water condensation in the system (300 to 350 cfm, 0.140 to 0.165 m^3/s , is sufficient for most vehicles).

(5) Sample collection bags for dilution air and exhaust samples shall be of sufficient size so as not to impede sample flow.

(c) *Component description, CFV-CVS.* The CFV-CVS, Figure B78-2 consists of a dilution air filter and mixing assembly, cyclonic particulate separator, sampling venturi, critical flow venturi, sampling system, and assorted valves, pressure and temperature sensors. The CFV-CVS shall conform to the following requirements:

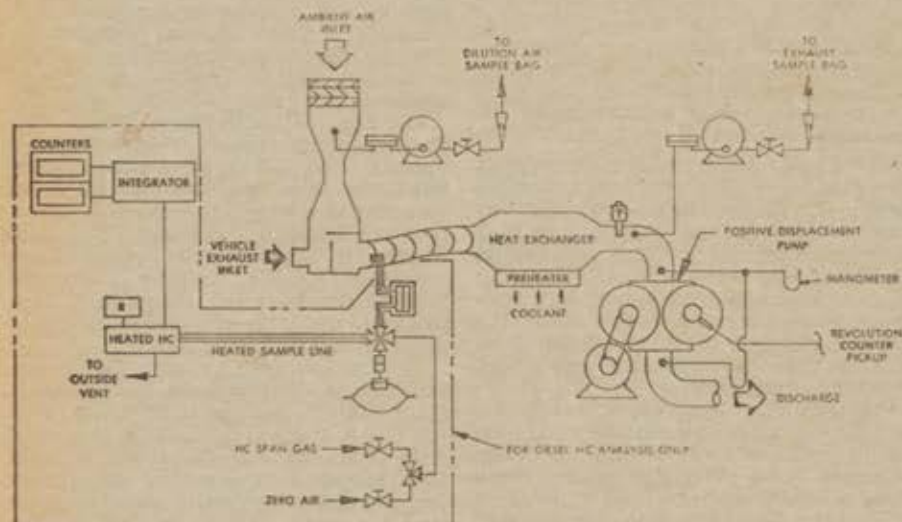
(1) Static pressure variations at the tailpipe(s) of the vehicle shall remain within ± 5 inches of water (1.2 kPa) of the static pressure variations measured during a dynamometer driving cycle with no connection to the tailpipe(s). (Sampling systems capable of maintaining the static pressure to within ± 1 inch of water (0.25 kPa) will be used by the Administrator if a written request substantiates the need for this closer tolerance.)

(2) The temperature measuring system shall have an accuracy and precision of $\pm 2^\circ\text{F}$ (1.1°C) and a response time of 0.100 seconds to 62.5 percent of a temperature change (as measured in hot silicone oil).

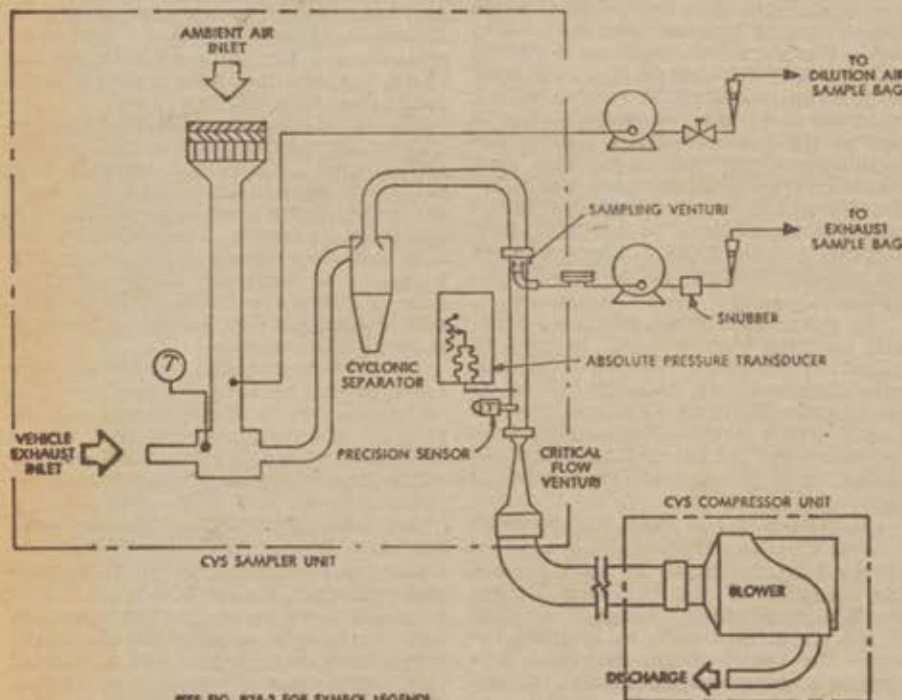
(3) The pressure measuring system shall have an accuracy and precision of ± 3 mm Hg (0.4 kPa).

(4) The flow capacity of the CVS shall be large enough to virtually eliminate water condensation in the system (300 to 350 cfm, 0.142 to 0.165 m^3/s , is sufficient for most vehicles).

(5) Sample collection bags for dilution air and exhaust samples shall be of sufficient size so as not to impede sample flow.



(SEE FIG. B78-3 FOR SYMBOL LEGEND)
FIGURE B78-1—EXHAUST GAS SAMPLING SYSTEM (PDP-CVS)



(SEE FIG. B78-3 FOR SYMBOL LEGEND)
FIGURE B78-3—EXHAUST GAS SAMPLING SYSTEM (CFV-CVS)

§ 86.110-78 [Reserved]

§ 86.111-78 Exhaust gas analytical system.

(a) *Schematic drawings.* Figure B78-3 is a schematic drawing of the exhaust gas analytical system. The schematic of the hydrocarbon analysis train for Diesel vehicles is shown as part of Figure B78-1. Since various configurations can produce accurate results, exact conformance with either drawing is not required. Additional components such as instruments, valves, solenoids, pumps and switches may be used to provide additional information and coordinate the functions of the component systems.

(b) *Major component description.* The analytical system, Figure B78-3, consists of a flame ionization detector (FID) for the determination of hydrocarbons, non-dispersive infrared analyzers (NDIR) for the determination of carbon monoxide and carbon dioxide and a chemiluminescence analyzer (CL) for the determination of oxides of nitrogen. A heated flame ionization detector (HFID) is used for the continuous determination of hydrocarbons from Diesel fueled vehicles, Figure B78-1. The exhaust gas analytical system shall conform to the following requirements:

(1) The CL requires that the nitrogen dioxide present in the sample be con-

verted to nitric oxide before analysis. Other types of analyzers may be used if shown to yield equivalent results and if approved in advance by the Administrator.

(2) The carbon monoxide (NDIR) analyzer may require a sample conditioning column containing CaSO_4 , or indicating silica gel to remove water vapor and containing ascarite to remove carbon dioxide from the CO analysis stream.

(1) If CO instruments which are essentially free of CO_2 and water vapor interference are used, the use of the conditioning column may be deleted, see §§ 86.122 and 86.144.

(ii) A CO instrument will be considered to be essentially free of CO_2 and water vapor interference if its response to a mixture of 3 percent CO_2 in N_2 which has been bubbled through water at room temperature produces an equivalent CO response, as measured on the most sensi-

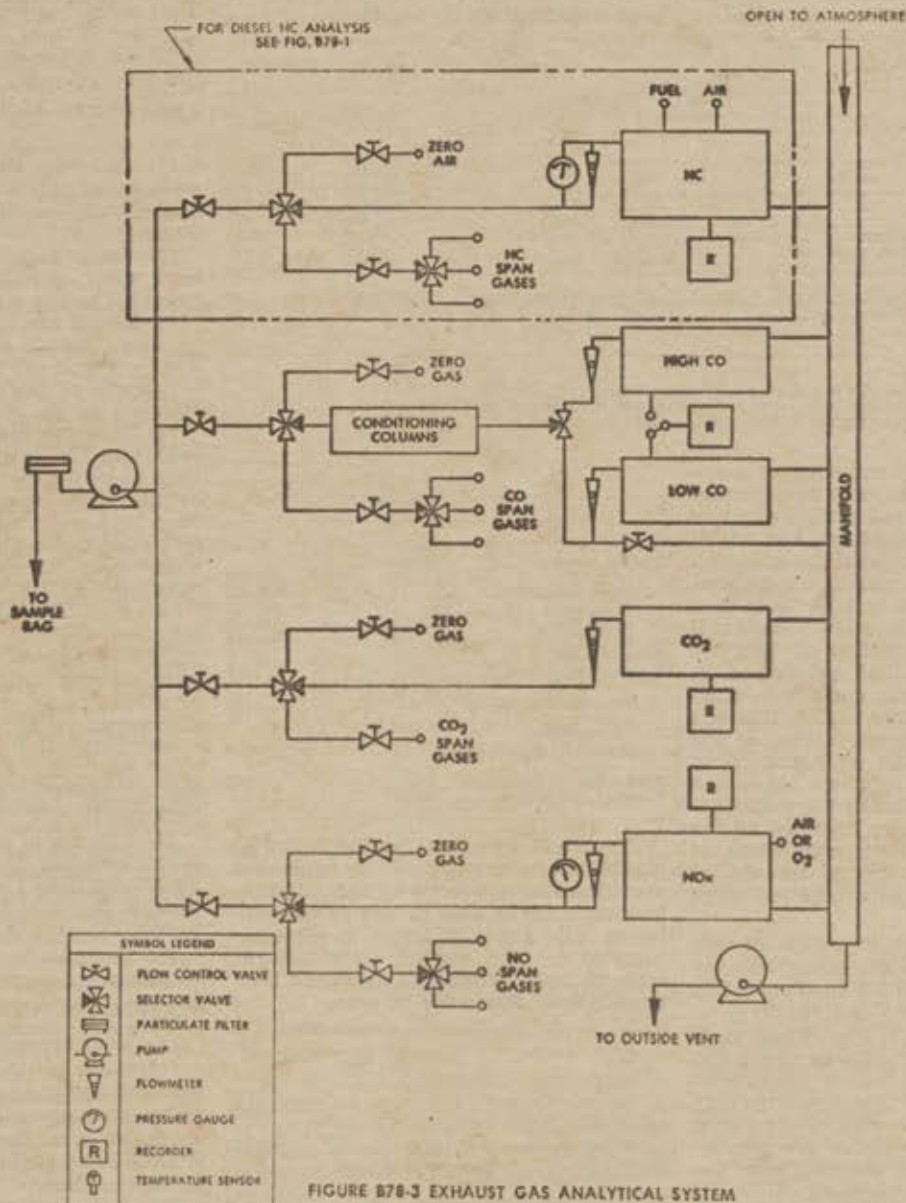


FIGURE B78-3 EXHAUST GAS ANALYTICAL SYSTEM

tive CO range, which is less than 1 percent of full scale CO concentration on ranges above 300 ppm full scale or less than 3 ppm on ranges below 300 ppm full scale, see § 86.122.

(3) For Diesel vehicles a continuous sample shall be measured using a

heated analyzer train as shown in Figure B78-1. The train shall include a heated continuous sampling line, a heated particulate filter, and a heated hydrocarbon instrument (HFID) complete with heated pump, filter and flow control system.

(i) The response time of this instrument shall be less than 1.5 seconds for 90 percent of full-scale response.

(ii) Sample transport time from sampling point to inlet of instrument shall be less than 4 seconds.

(iii) The sample line and filter shall be heated to a set point $\pm 10^\circ\text{F}$ ($\pm 5.6^\circ\text{C}$) between 300 and 390 $^\circ\text{F}$ (149 and 199 $^\circ\text{C}$).

(c) *Other analyzers and equipment.* Other types of analyzers and equipment may be used if shown to yield equivalent results and if approved in advance by the Administrator.

§ 86.112-78 [Reserved]

§ 86.113-78 Fuel specifications.

(a) *Gasoline.* (1) Gasoline having the following specifications will be used by the Administrator in exhaust and evaporative emission testing. Gasoline having the following specifications or substantially equivalent specifications approved by the Administrator, shall be used by the manufacturer in exhaust and evaporative testing, except that the lead and octane specifications do not apply.

Item	ASTM	Leaded	Unleaded
Octane, research, minimum	D2699	100	96
Pb. (organic), grams/U.S. gallon		1.4	0.00-0.05
Distillation range:			
IBP, $^\circ\text{F}$	D86	75-85	75-85
10 pct point, $^\circ\text{F}$	D86	120-135	120-135
50 pct point, $^\circ\text{F}$	D86	200-230	200-230
90 pct point, $^\circ\text{F}$	D86	300-325	300-325
EP, $^\circ\text{F}$ (maximum)	D86	415	415
Sulfur, weight percent, maximum	D1266	0.10	0.10
Phosphorus, grams/U.S. gallon, maximum		0.01	0.005
RVP ^{1,2} , per square inch	D323	8.7-9.2	8.7-9.2
Hydrocarbon composition:			
Olefins, percent, maximum	D1319	10	10
Aromatics, percent, maximum	D1319	35	35
Saturates	D1319	(9)	(9)

¹ Minimum.

² For testing at altitudes above 1,219 m (4,000 ft) the specified range is 7.5-10.5.

³ For testing which is unrelated to evaporative emission control, the specified range is 8.0-9.2.

⁴ For testing at altitudes above 1,219 m (4,000 ft) the specified range is 7.9-9.2.

⁵ Remainder.

(2) Gasoline representative of commercial gasoline which will be generally available through retail outlets shall be used in service accumulation. For leaded gasoline the minimum lead content shall be 1.4 grams per U.S. gallon, except that where the Administrator determines that vehicles represented by a test vehicle will be operated using gasoline of different lead content than that prescribed in this paragraph, he may consent in writing to use of a gasoline with a different lead content. The octane rating of the gasoline used shall be no higher than 4.0 research octane numbers above the minimum recommended by the manufacturer. The Reid Vapor Pressure of the gasoline used shall be characteristic of the motor fuel used during the season in which the service accumulation takes place.

(3) The specification range of the gasoline to be used under paragraph (a) (2) of this section shall be reported in accordance with § 86.078-21(b) (3).

(b) *Diesel fuel.* (1) The Diesel fuels employed for testing shall be clean and bright, with pour and cloud points adequate for operability. The Diesel fuel may contain nonmetallic additives as follows: Centane improver, metal deactivator, antioxidant, dehazer, antirust, pour depressant, dye, and dispersant.

(2) Diesel fuel meeting the following specifications, or substantially equivalent specifications approved by the Administrator, shall be used in exhaust emissions testing. The grade of Diesel fuel recommended by the engine manufacturer commercially designated as "Type 2D" grade Diesel fuel shall be used.

Item	ASTM test method No.	Type 2-D
Cetane	D613	43-50
Distillation range:	D86	
IBP, $^\circ\text{F}$		340-400
10 pct point, $^\circ\text{F}$		400-460
50 pct point, $^\circ\text{F}$		470-540
90 pct point, $^\circ\text{F}$		550-610
EP, $^\circ\text{F}$		580-660
Gravity, $^\circ\text{API}$	D287	33-37
Total sulfur, percent	D129 or D3622	0.2-0.5
Hydrocarbon composition:	D1319	
Aromatics, percent (minimum)		27
Paraffins, naphthenes, olefins		Remainder
Flashpoint, $^\circ\text{F}$ (minimum)	D93	130
Viscosity, centistokes	D445	2.0-3.2

(3) Diesel fuel meeting the following specifications, or substantially equivalent specifications approved by the Administrator, shall be used in service accumulation. The grade of Diesel fuel recommended by the engine manufacturer, commercially designated as "Type 2-D" grade Diesel fuel shall be used.

Item	ASTM test method No.	Type 2-D
Cetane (minimum)	D613	35-38
Distillation range:		
90 percent point, $^\circ\text{F}$	D86	430-630
Gravity $^\circ\text{API}$	D287	30-42
Total sulfur, percent (minimum)	D129 or D3622	0.2
Flashpoint, $^\circ\text{F}$ (minimum)	D93	130
Viscosity, centistokes	D445	1.5-4.5

(4) Other petroleum distillate fuel specifications:

(1) Other petroleum distillate fuels may be used for testing and service accumulation provided they are commercially available, and

(ii) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service, and

(iii) Use of a fuel listed under paragraphs (b) (2) and (b) (3) of this section would have a detrimental effect on emissions or durability, and

(iv) Written approval from the Administrator of the fuel specifications must be provided prior to the start of testing.

(5) The specification range of the fuels to be used under paragraphs (b) (2), (b) (3), and (b) (4) of this section shall be reported in accordance with § 86.078-21(b) (3).

§ 86.114-78 Analytical gases.

(a) Analyzer gases.

(1) Gases for the CO and CO₂ analyzers shall be single blends of CO and CO₂, respectively using nitrogen as the diluent.

(2) Gases for the hydrocarbon analyzer shall be single blends of propane using air as the diluent.

(3) Gases for the NO_x analyzer shall be single blends of NO named as NO_x with a maximum NO₂ concentration of 5 percent of the nominal value using nitrogen as the diluent.

(4) Fuel for the evaporative emission enclosure FID shall be a blend of 40 \pm 2 percent hydrogen with the balance being helium. The mixture shall contain less than 1 ppm equivalent carbon response. 98 to 100 percent hydrogen fuel may be used with advance approval by the Administrator.

(5) The allowable zero gas (air or nitrogen) impurity concentrations shall not exceed 1 ppm equivalent carbon response, 1 ppm carbon monoxide, 0.04 percent (400 ppm) carbon dioxide and 0.1 ppm nitric oxide.

(6) "Zero-grade air" includes artificial "air" consisting of a blend of nitrogen and oxygen with oxygen concentrations between 18 and 21 mole percent.

(7) The use of proportioning and precision blending devices to obtain the required analyzer gas concentrations is allowable provided their use has been approved in advance by the Administrator.

(b) Calibration gases should be known to within ± 2 percent of the true values.

§ 86.114-79 Analytical gases.

(a) Analyzer gases.

(1) Gases for the CO and CO₂ analyzers shall be single blends of CO and CO₂, respectively using nitrogen as the diluent.

(2) Gases for the hydrocarbon analyzer shall be single blends of propane using air as the diluent.

(3) Gases for NO_x analyzer shall be single blends of NO named as NO_x with a maximum NO₂ concentration of 5 percent of the nominal value, using nitrogen as the diluent.

(4) Fuel for the evaporative emission enclosure FID shall be a blend of 40 \pm 2% hydrogen with the balance being helium. The mixture shall contain less than 1

ppm equivalent carbon response. 98 to 100 percent hydrogen fuel may be used with advance approval by the Administrator.

(5) The allowable zero gas (air or nitrogen) impurity concentrations shall not exceed 1 ppm equivalent carbon response, 1 ppm carbon monoxide, 0.04 percent (400 ppm) carbon dioxide and 0.1 ppm nitric oxide.

(6) "Zero grade air" includes artificial "air" consisting of a blend of nitrogen and oxygen with oxygen concentrations between 18 and 21 mole percent.

(b) Calibration gases shall be traceable to within 1 percent of NBS gas standards, or other gas standards which have been approved by the Administrator.

(c) Span gases shall be accurate to within 2 percent of true concentration, where true concentration refers to NBS gas standards, or other gas standards which have been approved by the Administrator.

§ 86.115-78 EPA urban dynamometer driving schedule.

(a) The dynamometer driving schedule is listed in Appendix I. The driving schedule is defined by a smooth trace drawn through the specified speed vs. time relationships. It consists of a non-repetitive series of idle, acceleration, cruise, and deceleration modes of various time sequences and rates.

(b) The speed tolerance at any given time on the dynamometer driving schedule prescribed in Appendix I or as printed on a driver's aid chart approved by the Administrator, when conducted to meet the requirements of § 86.137 is defined by upper and lower limits. The upper limit is 2 mph (3.2 km/h) higher than the highest point on the trace within 1 second of the given time. The lower limit is 2 mph (3.2 km/h) lower than the lowest point on the trace within 1 second of the given time. Speed variations greater than the tolerances (such as may occur during gear changes) are acceptable provided they occur for less than 2 seconds on any occasion. Speeds lower than those prescribed are acceptable provided the vehicle is operated at maximum available power during such occurrences. When conducted to meet the requirements of § 86.128 the speed tolerance shall be as specified above, except that the upper and lower limits shall be 4 mph (6.4 km/h).

(c) Figures B78-4(a) and B78-4(b) show the range of acceptable speed tolerances for typical points. Figure B78-4(a) is typical of portions of the speed curve which are increasing or decreasing throughout the two second time interval. Figure B78-4(b) is typical of portions of the speed curve which include a maximum or minimum value.

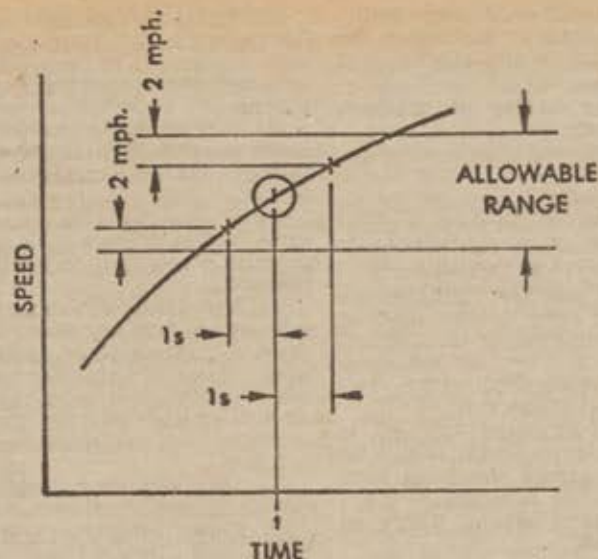


FIGURE B78-4a—DRIVERS TRACE, ALLOWABLE RANGE

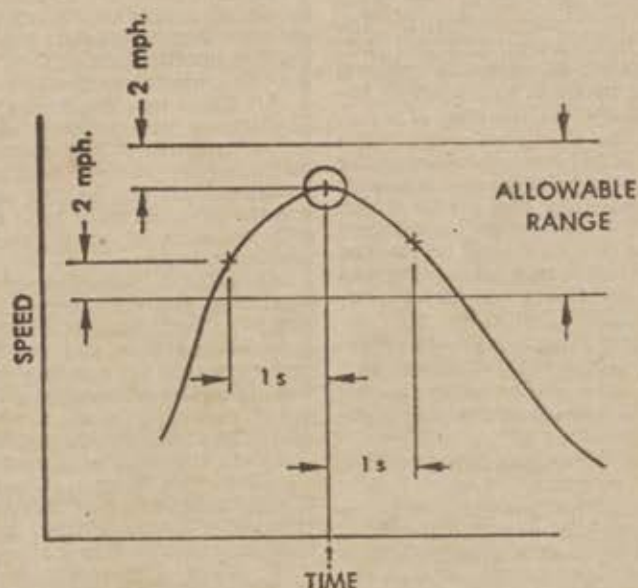


FIGURE B78-4b—DRIVERS TRACE, ALLOWABLE RANGE

§ 86.116-78 Calibrations; frequency and overview.

(a) Calibrations shall be performed as specified in §§ 86.117 through 86.126.

(b) At least yearly or after any maintenance which could alter background emission levels, enclosure background emission measurements shall be performed.

(c) At least monthly or after any maintenance which could alter calibration, the following calibrations and checks shall be performed:

(1) Calibrate the hydrocarbon analyzers (both evaporative and exhaust instruments), carbon dioxide analyzer, carbon monoxide analyzer, and oxides of nitrogen analyzer.

(2) Calibrate the dynamometer. If the dynamometer receives a weekly performance check (and remains within calibration) the monthly calibration need not be performed.

(3) Perform a hydrocarbon retention check and calibration on the evaporative emission enclosure.

(d) At least weekly or after any maintenance which could alter calibration, the following calibrations and checks shall be performed:

(1) Check the oxides of nitrogen converter efficiency, and
(2) Perform a CVS system verification, and

(3) Run a performance check on the dynamometer. This check may be omitted if the dynamometer has been calibrated within the preceding month.

(e) The CVS positive displacement pump or Critical Flow Venturi shall be calibrated following initial installation, major maintenance or as necessary when indicated by the CVS system verification (described in § 86.119).

(f) Sample conditioning columns, if used in the CO analyzer train, should be checked at a frequency consistent with observed column life or when the indicator of the column packing begins to show deterioration.

§ 86.117-73 Evaporative emission enclosure calibrations.

The calibration of the evaporative emission enclosure consists of three parts: Initial and periodic determination of enclosure background emissions; initial determination of enclosure internal volume; and periodic hydrocarbon retention check and calibration.

(a) *Initial and periodic determination of enclosure background emissions.* Prior to its introduction into service, annually thereafter, and after any repair which can affect the enclosure background emissions, the enclosure shall be checked to determine that it does not contain materials which will themselves emit hydrocarbons. Proceed as follows:

(1) Zero and span (calibrate if required) the hydrocarbon analyzer.

(2) Purge the enclosure until a stable background hydrocarbon reading is obtained.

(3) Turn on the mixing blower (if not already on).

(4) Seal enclosure and measure background hydrocarbon concentration, temperature, and barometric pressure. These are the initial readings C_{HCi} , T_i and P_{Bi} for the enclosure background determination.

(5) Allow the enclosure to stand undisturbed without sampling for four hours.

(6) Measure the hydrocarbon concentration on the same FID. This is the final concentration, C_{HCf} . Also measure final temperature and barometric pressure.

(7) Calculate the mass change of hydrocarbons in the enclosure according to the equations in paragraph (d) of this section. The enclosure background emissions shall not be greater than 0.4g for the 4 hours.

(b) *Initial determination of enclosure internal volume.* Prior to its introduction into service the enclosure internal volume shall be determined by the following procedure.

(1) Carefully measure the internal length, width and height of the enclosure, accounting for irregularities (such as braces) and calculate the internal volume.

(2) Perform an enclosure calibration check according to subparagraphs (1) through (7) of paragraph (c) of this section.

(3) If the calculated mass does not agree within 2 percent of the injected propane mass, then corrective action is required.

(c) *Hydrocarbon retention check and calibration.* The hydrocarbon retention check provides a check upon the calculated volume and also measures the leak rate. Prior to its introduction into service and at least monthly thereafter the enclosure leak rate shall be determined as follows:

(1) Zero and span (calibrate if required) the hydrocarbon analyzer.

(2) Purge the enclosure until a stable background hydrocarbon reading is obtained.

(3) Turn on the mixing blower (if not already on).

(4) Seal enclosure and measure background hydrocarbon concentration, temperature and barometric pressure. These are the initial readings C_{HCi} , T_i and P_{Bi} for the enclosure calibration.

(5) Inject into the enclosure a known quantity of pure propane. (4 g is a convenient quantity.) The propane may be measured by volume flow or by mass measurement. The method used to measure the propane shall have an accuracy and precision of ± 0.5 percent of the measured value.

(6) After a minimum of 5 minutes of mixing, analyze the enclosure atmosphere for hydrocarbon content, also record temperature and pressure. These measurements are the final readings for the enclosure calibration as well as the initial readings for the retention check.

(7) To verify the enclosure calibration calculate the mass of propane using the measurements taken in steps (4) and (6). See paragraph (d) of this section. This quantity must be within ± 2 percent of that measured in step 5 above.

(8) Allow the enclosure to remain sealed for a minimum of 4 hours without sampling and with the mixing blower operating. After 4 hours analyze the enclosure atmosphere for hydrocarbon content; record temperature and barometric pressure. These are the final readings for the hydrocarbon retention check.

(9) Calculate, using the equations in paragraph (d) and the readings taken in (8), the hydrocarbon mass. It may not differ by more than 4 percent of the value in step (6).

(d) *Calculations.* The calculation of net hydrocarbon mass change is used to determine enclosure background and leak rate. It is also used to check the enclosure volume measurements. The mass change is calculated from the initial and final readings of hydrocarbon concentration, temperature and pressure according to the following equation:

$$M_{HC} = kV \times 10^{-4} \left[\frac{C_{HCf} P_{af}}{T_f} - \frac{C_{HCi} P_{ai}}{T_i} \right]$$

Where:

M_{HC} = Hydrocarbon mass change, g.
 C_{HC} = Hydrocarbon concentration as ppm carbon.

V = Enclosure volume, ft³ (m³), as measured in paragraph (b)(1) of this section.

P_a = Barometric pressure, in. Hg (kPa).

T = Enclosure ambient temperature, R(K).

k = 3.05.

for SI units,

k = 17.60.

i = Indicates initial reading.

f = Indicates final reading.

NOTE: Hydrocarbon concentration is stated in ppm carbon, that is, ppm propane x3. Expressions in parenthesis are for SI units.

§ 86.118-73 Dynamometer calibration.

(a) The dynamometer shall be calibrated at least once each month or performance verified at least once each week and then calibrated as required. The calibration shall consist of the manufacturer's recommended calibration procedure plus a determination of the dynamometer frictional power absorption at 50.0 mph (80.5 km/h). One method for determining dynamometer frictional power absorption at 50.0 mph (80.5 km/h) is described below, other methods may be used if shown to yield equivalent results. The measured absorbed road power includes the dynamometer friction as well as the power absorbed by the power absorption unit. The dynamometer is driven above the test speed range. The device used to drive the dynamometer is then disengaged from the dynamometer and the roll(s) is (are) allowed to coast down. The kinetic energy of the system is dissipated by the dynamometer. This method neglects the variations in roll bearing friction due to the drive axle weight of the vehicle. The inertia of the free (rear) roll may be neglected in the case of dynamometers with paired rolls.

(1) Devise a method to determine the speed of the drive roll if it is not already measured. A fifth wheel, revolution pickup, or other suitable means may be used.

(2) Place a vehicle on the dynamometer or devise another method of driving the dynamometer.

(3) Engage the inertial flywheel or other inertial simulation system for the most common vehicle mass category for which the dynamometer is used. In addition other vehicle mass categories may be calibrated, if desired.

(4) Drive the dynamometer up to 50.0 mph (80.5 km/h).

(5) Record indicated road power.

(6) Drive the dynamometer up to 60.0 mph (96.9 km/h).

(7) Disengage the device used to drive the dynamometer.

(8) Record the time for the dynamometer drive roll to coastdown from 55.0 mph (88.5 km/h) to 45 mph (72.4 km/h).

(9) Adjust the power absorption unit to a different level.

(10) Repeat steps (4) to (9) above sufficient times to cover the range of road power used.

(11) Calculate absorbed road power (HP_a). See paragraph (c) of this section.

(12) Plot indicated road load power at 50 mph (80.5 km/h) versus road load power at 50 mph (80.5 km/h) as shown in Figure B78-5.

(b) The performance check consists of conducting a dynamometer coastdown at one or more inertia-horsepower settings and comparing the coastdown time to that recorded during the last calibration. If the coastdown times differ by more than 1 s, a new calibration is required.

(c) **Calculations.** The road load power actually absorbed by the dynamometer is calculated from the following equation:

$$HP_a = (1/2) (W/32.2) (V_1^2 - V_2^2) / 550t$$

Where:

HP_a = Power, horsepower (kilowatts)

W = Equivalent inertia, lb (kg)

V_1 = Initial Velocity, ft/s (m/s)

(55 mph = 88.5 km/h = 80.67 ft/s = 24.58 m/s)

V_2 = Final Velocity, ft/s (m/s)

(45 mph = 72.4 km/h = 66 ft/s = 20.11 m/s)

t = elapsed time for rolls to coast from 55 mph to 45 mph (88.5 to 72.4 km/h)

(Expressions in parenthesis are for SI units.) When the coastdown is from 55 to 45 mph (88.5 to 72.4 km/h) the above equation reduces to:

$$HP_a = 0.06073 (W/t)$$

for SI units,

$$HP_a = 0.00984 (W/t)$$

§ 86.119-78 CVS calibration.

The CVS is calibrated using an accurate flowmeter and restrictor valve. Measurements of various parameters are made and related to flow through the unit. Procedures used by EPA for both PDP and CFV are outlined below. Other procedures yielding equivalent results may be used if approved in advance by the Administrator. After the calibration curve has been obtained, verification of the entire system can be performed by injecting a known mass of gas into the system and comparing the mass indicated by the system to the true mass injected. An indicated error does not necessarily mean that the calibration is wrong, since other factors can influence the accuracy of the system, e.g. analyzer calibration. A verification procedure is found in paragraph (c) of this section.

(a) **PDP calibration.** (1) The following calibration procedure outlines the equipment, the test configuration, and the various parameters which must be measured to establish the flow rate of the CVS pump. All the parameters related to the pump are simultaneously measured with the parameters related to a flowmeter which is connected in series with the pump. The calculated flow rate ft³/min. (at pump inlet absolute pressure and temperature) can then be plotted versus a correlation function which is the value on a specific combination of pump parameters. The linear equation which relates the pump flow and the correlation function is then determined. In the event that a CVS has a multiple speed drive, a calibration for each range used must be performed.

(2) This calibration procedure is based on the measurement of the absolute values of the pump and flowmeter parameters that relate the flow rate at each point. Three conditions must be maintained to assure the accuracy and integrity of the calibration curve. First, the pump pressures should be measured at taps on the pump rather than at the external piping on the pump inlet and outlet. Pressure taps that are mounted at the top center and bottom center of the pump drive headplate are exposed to the actual pump cavity pressures, and

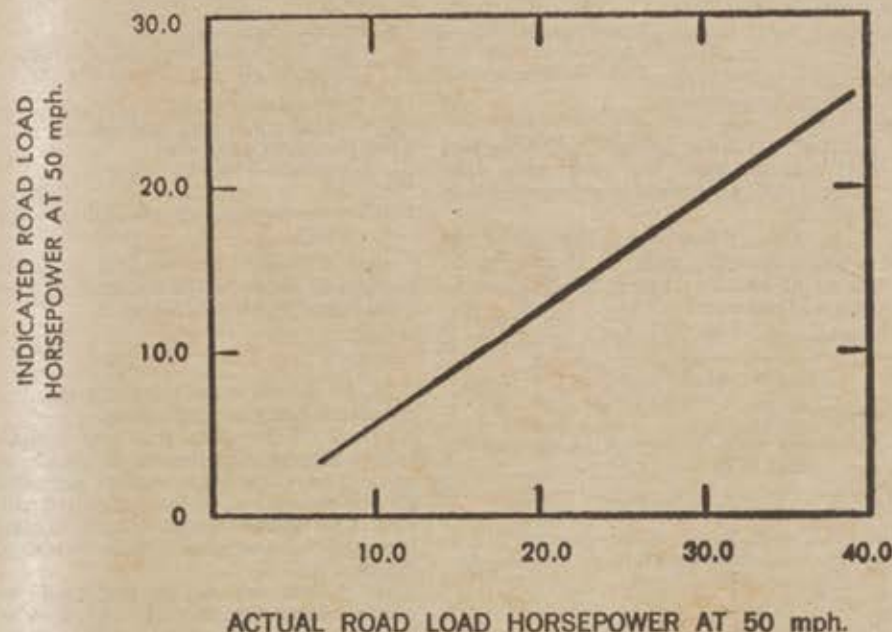


FIGURE B78-5—ROAD LOAD HORSEPOWER, ACTUAL VS. INDICATED

therefore reflect the absolute pressure differentials. Secondly, temperature stability must be maintained during the calibration. The laminar flowmeter is sensitive to inlet temperature oscillations which cause the data points to be scattered. Gradual changes ($\pm 2^\circ \text{F}$ (1.1°C)) in temperature are acceptable as long as they occur over a period of several minutes. Finally, all connections between the flowmeter and the CVS pump must be absolutely void of any leakage.

(3) During an exhaust emission test the measurement of these same pump parameters enables the user to calculate the flow rate from the calibration equation.

(4) Connect a system as shown in Figure B78-6. Although particular types of equipment are shown, other configurations that yield equivalent results may be used if approved in advance by the Administrator. For the system indicated, the following data with given accuracy are required:

CALIBRATION DATA MEASUREMENTS

Parameter	Symbol	Units	Tolerances
Barometric pressure (corrected)	P_b	Inches Hg (kPa).	$\pm .01$ in Hg ($\pm .034$ kPa).
Ambient temperature	T_a	$^\circ \text{F}$ ($^\circ \text{C}$).	$\pm .5^\circ \text{F}$ ($\pm .28^\circ \text{C}$).
Air temperature into LFE	T_i	$^\circ \text{F}$ ($^\circ \text{C}$).	$\pm .5^\circ \text{F}$ ($\pm .28^\circ \text{C}$).
Pressure depression upstream of LFE	EPI	Inches H_2O (kPa).	$\pm .25^\circ \text{F}$ ($\pm .14^\circ \text{C}$).
Pressure drop across the LFE matrix	EDP	Inches H_2O (kPa).	$\pm .05$ in H_2O ($\pm .012$ kPa).
Air temperature at CVS pump inlet	PTI	$^\circ \text{F}$ ($^\circ \text{C}$).	$\pm .05$ in H_2O ($\pm .001$ kPa).
Pressure depression at CVS pump inlet	PPI	Inches fluid (kPa).	$\pm .5^\circ \text{F}$ ($\pm .28^\circ \text{C}$).
Specific gravity of manometer fluid (1.75 oil)	Sp. Gr.		$\pm .05$ in fluid ($\pm .022$ kPa).
Pressure head at CVS pump outlet	PPO	Inches fluid (kPa).	$\pm .05$ in fluid ($\pm .022$ kPa).
Air temperature at CVS pump outlet (optional)	PTO	$^\circ \text{F}$ ($^\circ \text{C}$).	$\pm .5^\circ \text{F}$ ($\pm .28^\circ \text{C}$).
Pump revolutions during test period	N	Revs.	± 1 Rev.
Elapsed time for test period	t	s.	$\pm .05$ s.

(5) After the system has been connected as shown in Figure B78-6, set the variable restrictor in the wide open position and run the CVS pump for 20 minutes. Record the calibration data.

(6) Reset the restrictor valve to a more restricted condition in an increment of pump inlet depression (about 4" H_2O (1.0 kPa) that will yield a minimum of six data points for the total calibration. Allow the system to stabilize for 3 minutes and repeat the data acquisition.

(7) Data analysis:

(1) The air flow rate, Q_s , at each test

point is calculated in standard cubic feet per minute from the flowmeter data using the manufacturer's prescribed method.

(ii) The air flow rate is then converted to pump flow, V_s , in cubic feet per revolution at absolute pump inlet temperature and pressure.

$$V_s = \frac{Q_s}{n} \times \frac{T_i}{528} \times \frac{29.92}{P_i}$$

Where:

V_s = Pump flow, $\text{ft}^3/\text{revolution}$ ($\text{m}^3/\text{revolution}$) at T_i , P_i

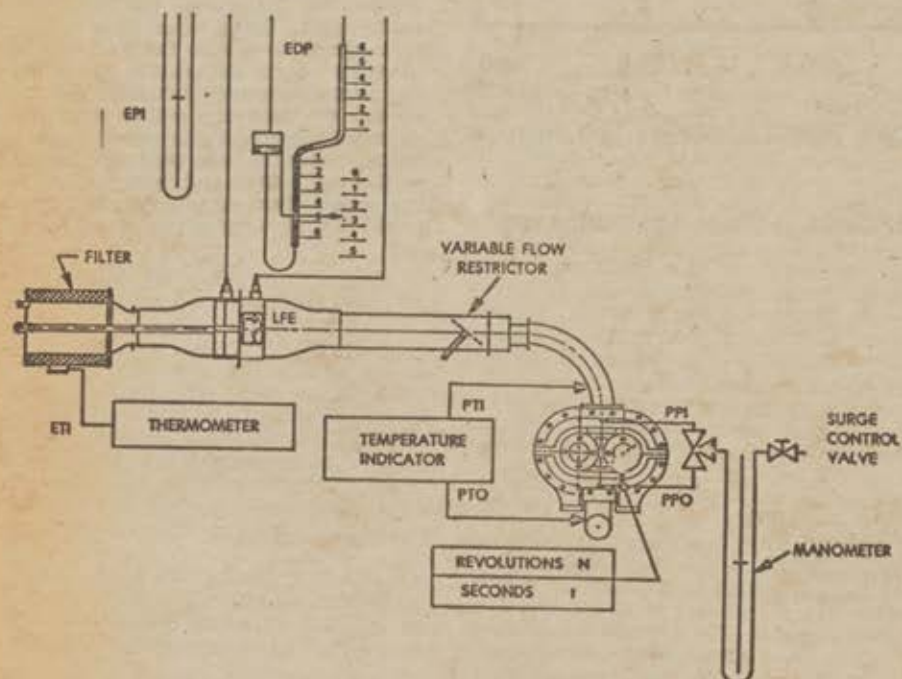


FIGURE B78-6—POP-CVS CALIBRATION CONFIGURATION

Q_s = Meter air flow rate in standard cubic feet per minute, standard conditions are 68° F, 29.92 in. Hg (20° C, 101.3 kPa).

n = Pump speed in revolutions per minute.
 T_i = Pump inlet temperature, R(K) = PTI + 460

for SI units, $T_i = \text{PTI} + 273$

P_i = Absolute pump inlet pressure, in. Hg (kPa) = $P_b - \text{PPI}$ (SP. GR./13.57)

for SI units, $P_i = P_b - \text{PPI}$

Where:

P_b = barometric pressure, in. Hg (kPa)
 PPI = Pump inlet depression, in. fluid (kPa)

SP. GR. = Specific gravity of manometer fluid relative to water.

(iii) The correlation function at each test point is then calculated from the calibration data:

$$X_s = \frac{1}{n} \sqrt{\frac{\Delta P_s}{P_s}}$$

Where:

X_s = correlation function.

ΔP_s = The pressure differential from pump inlet to pump outlet, in. Hg (kPa) = $P_s - P_p$

P_s = Absolute pump outlet pressure, in. Hg (kPa) = $P_b + \text{PPO}$ (SP. GR./13.57)
 for SI units, $P_s = P_b + \text{PPO}$

Where:

PPO = Pressure head at pump outlet, in. fluid (kPa)

(iv) A linear least squares fit is performed to generate the calibration equations which have the forms:

$$V_s = D_0 - M(X_s)$$

$$n = A - B(\Delta P_s)$$

D_0 , M , A , and B are the slope-intercept constants describing the lines.

(8) A CVS system that has multiple speeds should be calibrated on each speed used. The calibration curves generated for the ranges will be approximately parallel and the intercept values, D_0 , will increase as the pump flow range decreases.

(9) If the calibration has been performed carefully, the calculated values from the equation will be within ± 0.50 percent of the measured value of V_s . Values of M will vary from one pump to another, but values of D_0 for pumps of the same make, model, and range should agree within ± 3 percent of each other. Particulate influx from use will cause the pump slip to decrease as reflected by lower values for M . Calibrations should be performed at pump start-up and after major maintenance to assure the stability of the pump slip rate. Analysis of mass injection data will also reflect pump slip stability.

(b) CFV calibration. (1) Calibration of the CFV is based upon the flow equation for a critical venturi. Gas flow is a function of inlet pressure and temperature:

$$Q_s = \frac{K_c P}{\sqrt{T}}$$

Where:

Q_s = Flow

K_c = Calibration coefficient

P = Absolute pressure

T = Absolute temperature

The calibration procedure described below establishes the value of the calibration coefficient at measured values of pressure, temperature and air flow.

(2) The manufacturer's recommended

procedure shall be followed by calibrating electronic portions of the CFV.

(3) Measurements necessary for flow calibration are as follows:

CALIBRATION DATA MEASUREMENTS

Parameter	Symbol	Units	Tolerances
Barometric pressure (corrected)	P _B	Inches Hg (kPa)	±.01 in Hg (±.034 kPa).
Air temperature, flowmeter	T _F	°F (°C)	±.25°F (±.14°C).
Pressure depression upstream of LFE	EPI	Inches H ₂ O (kPa)	±.05 in H ₂ O (±.012 kPa).
Pressure drop across LFE matrix	EDP	Inches H ₂ O (kPa)	±.005 in H ₂ O (±.001 kPa).
Air flow	Q _s	F ³ /min. (m ³ /min.)	±.5 pct.
CFV inlet depression	PPI	Inches fluid (kPa)	±.05 in fluid (±.022 kPa).
Temperature at venturi inlet	T _v	°F (°C)	±.5°F (±.28°C).
Specific gravity of manometer fluid (1.75 oil)	Sp. Gr.		

(4) Set up equipment as shown in Figure B78-7 and check for leaks. Any leaks between the flow measuring device and the critical flow venturi will seriously affect the accuracy of the calibration.

(5) Set the variable flow restrictor to the open position, start the blower, and allow the system to stabilize. Record data from all instruments.

(6) Vary the flow restrictor and make at least 8 readings across the critical flow range of the venturi.

(7) Data analysis: The data recorded during the calibration are to be used in the following calculations:

(i) The air flow rate, Q_s, at each test point is calculated in standard cubic feet per minute from the flow meter data using the manufacturer's prescribed method.

(ii) Calculate values of the calibration coefficient for each test point:

$$K_v = \frac{Q_s \sqrt{T_v}}{P_v}$$

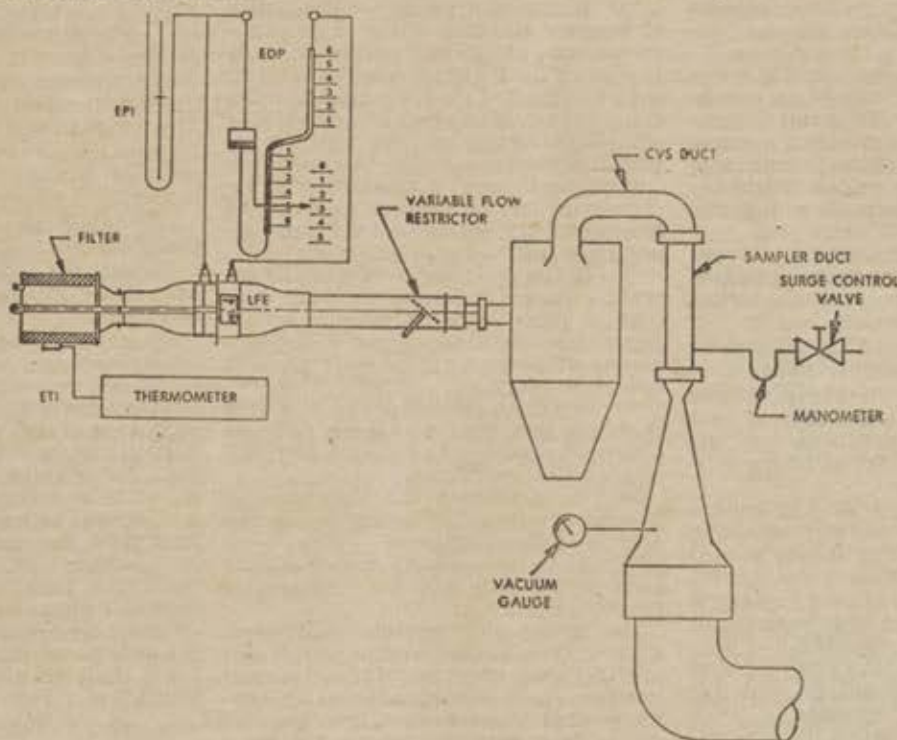


FIGURE B78-7 CFV-CVS CALIBRATION CONFIGURATION

Where:

Q_s = Flow rate in standard cubic feet per minute, standard conditions are 68° F, 29.92 in. Hg (20° C, 101.3 kPa).

T_v = Temperature at venturi inlet, R(K).

P_v = Pressure at venturi inlet, mm Hg (kPa) = P_B - PPI (SP. GR./13.57).

for SI units P_v = P_B - PPI.

Where:

PPI = Venturi inlet pressure depression, in. fluid (kPa).

SP. GR. = Specific gravity of manometer fluid, relative to water.

(iii) Plot K_v as a function of venturi inlet pressure. For sonic flow K_v will have a relatively constant value. As pressure decreases (vacuum increases) the venturi becomes unchoked and K_v decreases. See Figure B78-8.

(iv) For a minimum of 8 points in the critical region calculate an average K_v and the standard deviation.

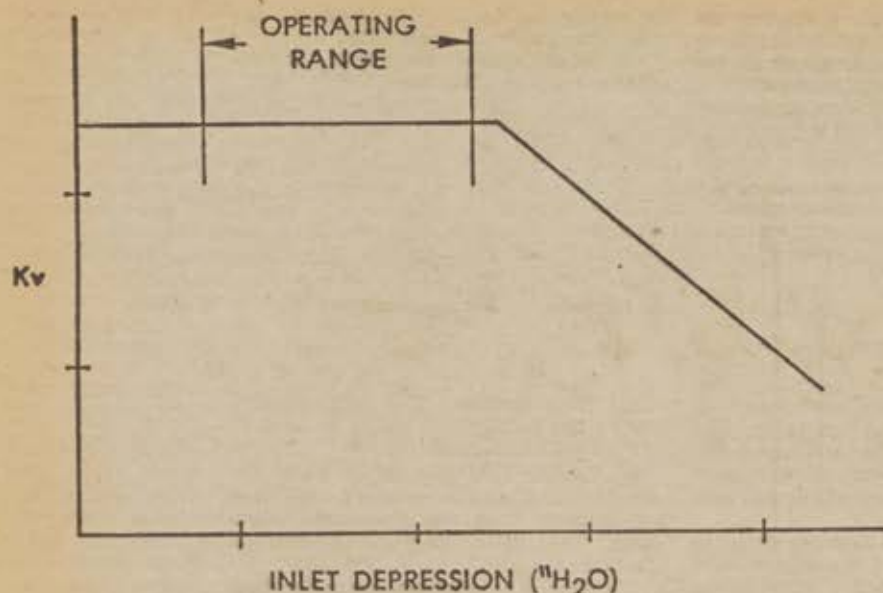


FIGURE B78-8—SONIC FLOW CHOKING

(v) If the standard deviation exceeds 0.3 percent of the average K, take corrective action.

(c) *CVS System Verification.* The following "gravimetric" technique can be used to verify that the CVS and analytical instruments can accurately measure a mass of gas that has been injected into the system. (Verification can also be accomplished by constant flow metering using critical flow orifice devices.)

(1) Obtain a small cylinder that has been charged with pure propane or carbon monoxide gas (caution—carbon monoxide is poisonous).

(2) Determine a reference cylinder weight to the nearest 0.01 grams.

(3) Operate the CVS in the normal manner and release a quantity of pure propane or carbon monoxide into the system during the sampling period (approximately 5 minutes).

(4) The calculations of § 86.144 are performed in the normal way except, in the case of propane. The density of propane (17.30 g/ft³/carbon atom (0.6109 kg/m³/carbon atom)) is used in place of the density of exhaust hydrocarbons. In the case of carbon monoxide, the density of 32.97 g/ft³ (1.164 kg/m³) is used.

(5) The gravimetric mass is subtracted from the CVS measured mass and then divided by the gravimetric mass to determine the percent accuracy of the system.

(6) The cause for any discrepancy greater than ± 2 percent must be found and corrected.

§ 86.120-78 [Reserved]

§ 86.121-78 Hydrocarbon analyzer calibration.

The FID hydrocarbon analyzer shall receive the following initial and periodic calibration. The HFID shall be operated to a set point $\pm 10^\circ F$ ($\pm 5.5^\circ C$) between 300 and 390 $^\circ F$ (149 and 199 $^\circ C$).

(a) Initial and periodic optimization of detector response. Prior to its introduction into service and at least annually thereafter the FID hydrocarbon analyzer shall be adjusted for optimum hydrocarbon response. Alternate methods yielding equivalent results may be used, if approved in advance by the Administrator.

(1) Follow the manufacturer's instructions for instrument startup and basic operating adjustment using the appropriate fuel and zero-grade air.

(2) Optimize on the most common operating range. Introduce into the analyzer, a propane in air mixture with a propane concentration equal to approximately 90 percent of the most common operating range.

(3) Select an operating fuel flow rate that will give near maximum response and least variation in response with minor fuel flow variations.

(4) To determine the optimum air flow, use the fuel flow setting determined above and vary air flow.

(5) After the optimum flow rates have been determined, they are recorded for future reference.

(b) Initial and periodic calibration. Prior to its introduction into service and monthly thereafter the FID hydrocarbon analyzer shall be calibrated on all normally used instrument ranges. Use the same flow rate as when analyzing samples.

(1) Adjust analyzer to optimize performance.

(2) Zero the hydrocarbon analyzer with zero-grade air.

(3) Calibrate on each normally used operating range with propane in air calibration gases having nominal concentrations of 15, 30, 45, 60, 75, and 90 percent of that range. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated

by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

§ 86.122-78 Carbon monoxide analyzer calibration.

The NDIR carbon monoxide analyzer shall receive the following initial and periodic calibrations:

(a) *Initial and periodic interference check.* Prior to its introduction into service and annually thereafter the NDIR carbon monoxide analyzer shall be checked for response to water vapor and CO:

(1) Follow the manufacturer's instructions for instrument startup and operation. Adjust the analyzer to optimize performance on the most sensitive range to be used.

(2) Zero the carbon monoxide analyzer with either zero-grade air or zero-grade nitrogen.

(3) Bubble a mixture of 3 percent CO, in N, through water at room temperature and record analyzer response.

(4) An analyzer response of more than 1 percent of full scale for ranges above 300 ppm full scale or of more than 3 ppm on ranges below 300 ppm full scale will require corrective action. (Use of conditioning columns is one form of corrective action which may be taken.)

(b) *Initial and periodic calibration.* Prior to its introduction into service and monthly thereafter the NDIR carbon monoxide analyzer shall be calibrated.

(1) Adjust the analyzer to optimize performance.

(2) Zero the carbon monoxide analyzer with either zero-grade air or zero-grade nitrogen.

(3) Calibrate on each normally used operating range with carbon monoxide in N, calibration gases having nominal concentrations of 15, 30, 45, 60, 75, and 90 percent of that range. Additional calibration points may be generated. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

§ 86.123-78 Oxides of nitrogen analyzer calibration.

The chemiluminescent oxides of nitrogen analyzer shall receive the following initial and periodic calibration.

(a) Prior to its introduction into service and weekly thereafter the chemiluminescent oxides of nitrogen analyzer shall be checked for NO_x to NO converter efficiency. Figure B78-9 is a reference for the following steps:

(1) Follow the manufacturer's instructions for instrument startup and operation. Adjust the analyzer to optimize performance.

- (2) Zero the oxides of nitrogen analyzer with zero-grade air or zero-grade nitrogen.
- (3) Connect the outlet of the NOx generator to the sample inlet of the oxides of nitrogen analyzer which has been set to the most common operating range.

- (4) Introduce into the NOx generator analyzer-system an NO in nitrogen (N₂) mixture with an NO concentration equal to approximately 80 percent of the most common operating range. The NO_x content of the gas mixture shall be less than 5 percent of the NO concentration.

- (2) Zero the oxides of nitrogen analyzer with zero-grade air or zero-grade nitrogen.

- (3) Calibrate on each normally used operating range with NO in N₂ calibration gases having nominal concentrations of 15, 30, 45, 60, 75, and 90 percent of that range. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

§ 86.124-78 Carbon dioxide analyzer calibration.

Prior to its introduction into service and monthly thereafter the NDIR carbon dioxide analyzer shall be calibrated:

- (a) Follow the manufacturer's instructions for instrument startup and operation. Adjust the analyzer to optimize performance.

- (b) Zero the carbon dioxide analyzer with either zero-grade air or zero-grade nitrogen.

- (c) Calibrate on each normally used operating range with carbon dioxide in N₂ calibration gases with nominal concentrations of 15, 30, 45, 60, 75, and 90 percent of that range. Additional calibration points may be generated. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

§ 86.125-78 [Reserved]

§ 86.126-78 Calibration of other equipment.

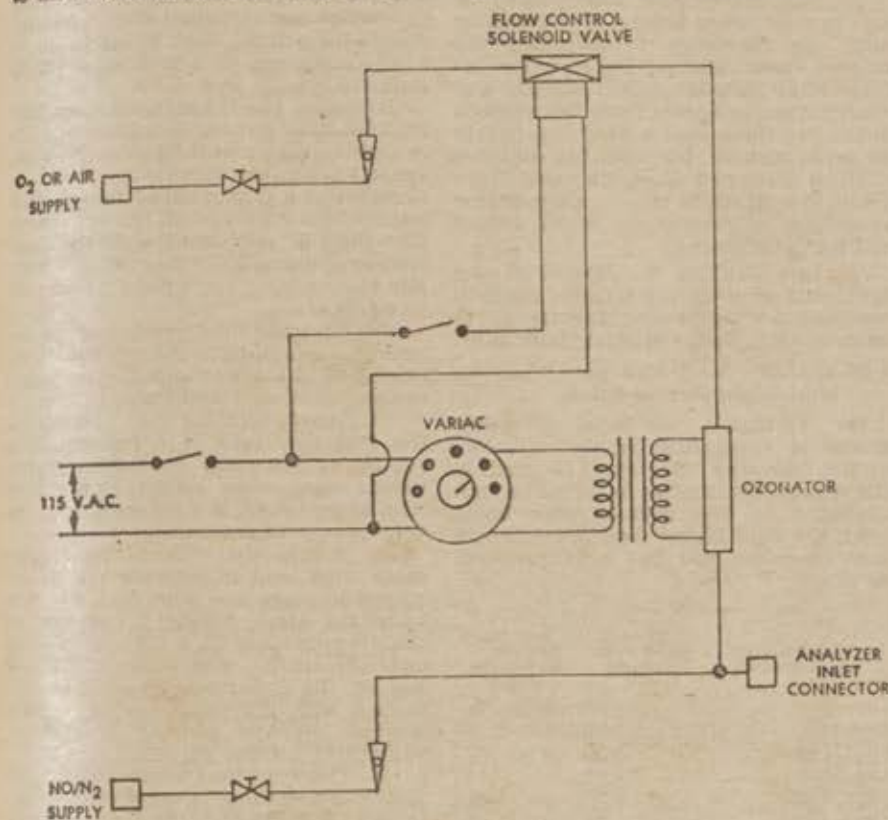
Other test equipment used for testing shall be calibrated as often as required by the manufacturer or as necessary according to good practice.

§ 86.127-78 Test procedures; overview.

The procedures described in this and subsequent sections are used to determine the conformity of vehicles with the standards set forth in Subpart A for light-duty vehicles and light-duty trucks.

- (a) The overall test consists of prescribed sequences of fueling, parking, and operating conditions. Vehicles are either tested for only exhaust emissions or are tested for exhaust and evaporative emissions. The evaporative portion of the test procedure occurs before and after the exhaust emission test, and, in some cases, during the exhaust emission test.

- (b) The exhaust emission test is designed to determine hydrocarbon, carbon monoxide, and oxides of nitrogen mass emissions while simulating an average trip in an urban area of 7.5 miles



(SEE FIG B78-3 FOR SYMBOL LEGEND)
FIGURE B78-9—NOx CONVERTER EFFICIENCY DETECTOR

- (5) With the oxides of nitrogen analyzer in the NO mode, record the concentration of NO indicated by the analyzer.

- (6) Turn on the NOx generator O₂ (or air) supply and adjust the O₂ (or air) flow rate so that the NO indicated by the analyzer is about 10 percent less than indicated in step (5). Record the concentration of NO in this NO+O₂ mixture.

- (7) Switch the NOx generator to the generation mode and adjust the generation rate so that the NO measured on the analyzer is 20 percent of that measured in step (5). There must be at least 10 percent unreacted NO at this point. Record the concentration of residual NO.

- (8) Switch the oxides of nitrogen analyzer to the NOx mode and measure total NOx. Record this value.

- (9) Switch off the NOx generation but maintain gas flow through the system. The oxides of nitrogen analyzer will indicate the NOx in the NO+O₂ mixture. Record this value.

- (10) Turn off the NOx generator O₂ (or air) supply. The analyzer will now

indicate the NOx in the original NO in N₂ mixture. This value should be no more than 5 percent above the value indicated in step (4).

- (11) Calculate the efficiency of the NOx converted by substituting the concentrations obtained into the following equation:

$$\text{Percent Eff.} = \left(\frac{a-b}{c-d} \right) \times 100$$

- where a—concentration obtained in step (8).
b—concentration obtained in step (9).
c—concentration obtained in step (6).
d—concentration obtained in step (7).

If converter efficiency is not greater than 90 percent corrective action will be required.

- (b) Initial and periodic calibration. Prior to its introduction into service and monthly thereafter the chemiluminescent oxides of nitrogen analyzer shall be calibrated on all normally used instrument ranges. Use the same flow rate as when analyzing samples. Proceed as follows:

- (1) Adjust analyzer to optimize performance.

(12.1 km). The test consists of engine startups and vehicle operation on a chassis dynamometer, through a specified driving schedule. A proportional part of the diluted exhaust emissions is collected continuously for subsequent analysis, using a constant volume (variable dilution) sampler (Diesel dilute exhaust is continuously analyzed for hydrocarbons using a heated sample line and analyzer).

(c) The evaporative emission test (gasoline-fueled vehicles only) is designed to determine hydrocarbon evaporative emissions as a consequence of diurnal temperature fluctuation, urban driving, and hot soaks during parking. It is associated with a series of events representative of a motor vehicle's operation, which result in hydrocarbon vapor losses. The test procedure is designed to measure:

(1) Diurnal breathing losses resulting from daily temperature changes, measured by the enclosure technique;

(2) Running losses from suspected sources (if indicated by engineering analysis or vehicle inspection) resulting from a simulated trip on a chassis dynamometer, measured by carbon traps; and

(3) Hot soak losses which result when the vehicle is parked and the hot engine is turned off, measured by the enclosure technique.

(d) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle shall be functioning during all procedures in this subpart. Maintenance to correct component malfunction or failure shall be authorized in accordance with § 86.078-25.

§ 86.128-78 Transmissions.

(a) All test conditions, except as noted, shall be run according to the manufacturer's recommendation to the ultimate purchaser.

(b) Vehicles equipped with free wheeling or overdrive shall be tested with these features operated according to the manufacturer's recommendations to the ultimate purchaser.

(c) Idle modes shall be run with automatic transmission in "Drive" and the wheels braked; manual transmissions shall be in gear with the clutch disengaged, except first idle (see §§ 86.136 and 86.137).

(d) The vehicle shall be driven with minimum accelerator pedal movement to maintain the desired speed.

(e) Accelerations shall be driven smoothly according to the manufacturer's recommendation to the ultimate purchaser. For manual transmissions, the operator shall release the accelerator pedal during each shift and

accomplish the shift with minimum time. If the vehicle cannot accelerate at the specified rate, the vehicle shall be operated with the accelerator pedal fully depressed until the vehicle speed reaches the value prescribed for that time in the driving schedule.

(f) The deceleration modes shall be run in gear using brakes or accelerator pedal as necessary to maintain the desired speed. Manual transmission vehicles shall have the clutch engaged and shall not change gears from the previous mode. For those modes which decelerate to zero, manual transmission clutches shall be depressed when the speed drops below 15 mph (24.14 km/h), when engine roughness is evident, or when engine stalling is imminent.

(g) Downshifting is allowed at the beginning of or during a power mode in accordance with the manufacturer's recommendation to the ultimate purchaser.

§ 86.129-78 Road load power and inertia weight determination.

(a) Flywheels, electrical or other means of simulating inertia as shown in the following table shall be used. If the equivalent inertia specified is not available on the dynamometer being used, the next higher equivalent inertia (not to exceed 250 lbs) available shall be used.

Loaded vehicle weight (pounds)	Equivalent inertia weight (pounds)	Road load power at 50 mph (horsepower)
Up to 1,125	1,000	5.9
1,126 to 1,375	1,250	6.5
1,376 to 1,625	1,500	7.1
1,626 to 1,875	1,750	7.7
1,876 to 2,125	2,000	8.3
2,126 to 2,375	2,250	8.8
2,376 to 2,625	2,500	9.4
2,626 to 2,875	2,750	9.9
2,876 to 3,125	3,000	10.3
3,126 to 3,375	3,250	11.2
3,376 to 3,625	4,000	12.0
3,626 to 3,875	4,500	12.7
3,876 to 4,125	5,000	13.4
4,126 to 4,375	5,500	13.9
4,376 to 4,625	5,500	14.4

(b) Power absorption unit adjustment.

(1) The power absorption unit shall be adjusted to reproduce road load power at 50 mph true speed. The indicated road load power setting shall take into account the dynamometer friction. The relationship between road load (absorbed) power and indicated road load power for a particular dynamometer shall be determined by the procedure outlined in § 86.118 or other suitable means.

(2) The road load power listed in the table above shall be used or the vehicle manufacturer may determine the road load power by an alternate procedure re-

quested by the manufacturer and approved in advance by the Administrator, or the vehicle manufacturer may determine the road load power by the following procedure and request its use:

(i) *Gasoline-fueled vehicles.* (A) Measuring the absolute manifold pressure of a representative vehicle, of the same equivalent inertia weight class, when operated on a level road under balanced wind conditions at a true speed of 50 mph (80 km/h), and

(B) Noting the dynamometer indicated road load horsepower setting required to reproduce that manifold pressure when the same vehicle is operated on the dynamometer at a true speed of 50 mph. The tests on the road and on the dynamometer shall be performed with the same vehicle ambient absolute pressure (usually barometric), i.e., within ± 5 mm Hg (± 0.7 kPa).

(C) The road load power shall be determined according to the procedure outlined in § 86.118 and adjusted according to the following if applicable.

(ii) *Diesel vehicles.* (A) Measuring the fuel flow rate of a representative vehicle of the same equivalent inertia weight class, when operated on a level road under balanced wind conditions at a true speed of 50 mph, and

(B) Noting the dynamometer indicated road load horsepower setting required to reproduce that fuel flow rate when the same vehicle is operated on the dynamometer at a true speed of 50 mph (80 km/h). The tests on the road and on the dynamometer shall be performed with the same vehicle ambient absolute pressure (usually barometric), i.e., within ± 5 mm Hg (± 0.7 kPa).

(C) The road load power shall be determined according to the procedure outlined in § 86.118 and adjusted according to the following if applicable.

(3) Where it is expected that more than 33 percent of the vehicles in an engine family will be equipped with air conditioning, the road load power listed above or as determined in paragraph (b) (2) of this section shall be increased by 10 percent for testing all test vehicles representing such an engine family if those vehicles are intended to be offered with air conditioning in production.

§ 86.129-79 Road load power and inertia weight determination.

(a) Flywheels, electrical or other means of simulating inertia as shown in the following table shall be used. If the equivalent inertia specified is not available on the dynamometer being used, the next higher equivalent inertia (not to exceed 250 pounds) available shall be used.

Loaded vehicle weight (pounds)	Equivalent inertia weight (pounds)	Road load power at 50 mph (horsepower)	
		Light Duty Vehicles	Light Duty Trucks
Up to 1,125-----	1,000	5.9	
1,126 to 1,375-----	1,250	6.5	
1,376 to 1,625-----	1,500	7.1	
1,626 to 1,875-----	1,750	7.7	
1,876 to 2,125-----	2,000	8.3	
2,126 to 2,375-----	2,250	8.8	
2,376 to 2,625-----	2,500	9.4	
2,626 to 2,875-----	2,750	9.9	
2,876 to 3,250-----	3,000	10.3	
3,251 to 3,750-----	3,500	11.2	
3,751 to 4,250-----	4,000	12.0	
4,251 to 4,750-----	4,500	12.7	
4,751 to 5,250-----	5,000	13.4	
5,251 to 5,750-----	5,500	13.9	
5,751 to 6,250-----	6,000(1)	14.4(1)	
6,251 to 6,750-----	6,500	-	
6,751 to 7,250-----	7,000	-	
7,251 to 7,750-----	7,500	-	
7,751 to 8,250-----	8,000	-	
8,251 to 8,750-----	8,500	-	
8,751 to 9,250-----	9,000	-	
9,251 to 9,750-----	9,500	-	
9,751 to 10,000-----	10,000	-	

See notes
(2) thru (4)

Notes:

(1) Light duty vehicles over 5,750 pounds loaded vehicle weight shall be tested with a 5,500 pound equivalent inertia and a 14.4 horsepower road load.

(2) For all light duty trucks except vans, and for heavy duty vehicles optionally certified as light duty trucks, the road load power (horsepower) at 50 mph shall be 0.58 times A (defined below) rounded to the nearest one half horsepower.

(3) For vans, the road load power at 50 mph (horsepower) shall be 0.50 times A (defined below) rounded to the nearest one-half horsepower.

(4) "A" is the basic vehicle frontal area (ft²) plus the additional frontal area (ft²) of mirrors and optional equipment exceeding 0.1 square feet which are anticipated to be sold on more than 33 percent of the car line. Frontal area measurements shall be computed to the nearest 1/16 of a square foot.

(b) Power absorption unit adjustment.

(1) The power absorption unit shall be adjusted to reproduce road load power at 50 mph true speed. The indicated road load power setting shall take into account the dynamometer friction. The relationship between road load (absorbed) power and indicated road load power for a particular dynamometer shall be determined by the procedure outlined in § 86.118 or other suitable means.

(2) The road load power listed in the table above shall be used or the vehicle manufacturer may determine the road

load power by an alternate procedure requested by the manufacturer and approved in advance by the Administrator, or the vehicle manufacturer may determine the road load power by the following procedure and request its use:

(1) Gasoline-fueled vehicles. (A) Measuring the absolute manifold pressure of a representative vehicle, of the same equivalent inertia weight class, when operated on a level road under balanced wind conditions at a true speed of 50 mph (80 km/h), and

(B) Noting the dynamometer indicated road load horsepower setting required to reproduce that manifold pressure when the same vehicle is operated on the dynamometer at a true speed of 50 mph. The tests on the road and on the dynamometer shall be performed with the same vehicle ambient absolute pressure (usually barometric), i.e., within ±5 mm Hg (±0.7 kPa).

(C) The road load power shall be determined according to the procedure outlined in § 86.118 and adjusted according to the following if applicable.

(i) Diesel vehicles. (A) Measuring the fuel flow rate of a representative vehicle of the same equivalent inertia weight class, when operated on a level road under balanced wind conditions at a true speed of 50 mph, and

(B) Noting the dynamometer indicated road load horsepower setting required to reproduce that fuel flow rate when the same vehicle is operated on the dynamometer at a true speed of 50 mph (80 km/h). The tests on the road and on the dynamometer shall be performed with the same vehicle ambient absolute pressure (usually barometric), i.e., within ±5 mm Hg (±0.7 kPa).

(C) The road load power shall be determined according to the procedure outlined in § 86.118 and adjusted according to the following if applicable.

(b) (3) Where it is expected that more than 33 percent of the vehicles in an engine family will be equipped with air conditioning, the road load power listed above or as determined in paragraph (b) (2) of this section shall be increased by 10 percent, up to a maximum increase of 1.4 horsepower, for testing all test vehicles representing such an engine family if those vehicles are intended to be offered with air conditioning in production. If the table in paragraph (b) (1) of this section is used to determine the road load power for light-duty trucks, the above increase for air conditioning shall be added prior to rounding off as instructed by notes 2 and 3 of the table.

§ 86.130-78 Test sequence: general requirements.

The test sequence shown in Figure B78-10 shows the steps encountered as the test vehicle undergoes the procedures subsequently described to determine conformity with the standards set forth. Ambient temperature levels encountered by the test vehicle throughout the test sequence shall not be less than 68° F (20° C) nor more than 86° F (30° C). The vehicle shall be approximately level during all phases of the test sequence to prevent abnormal fuel distribution.

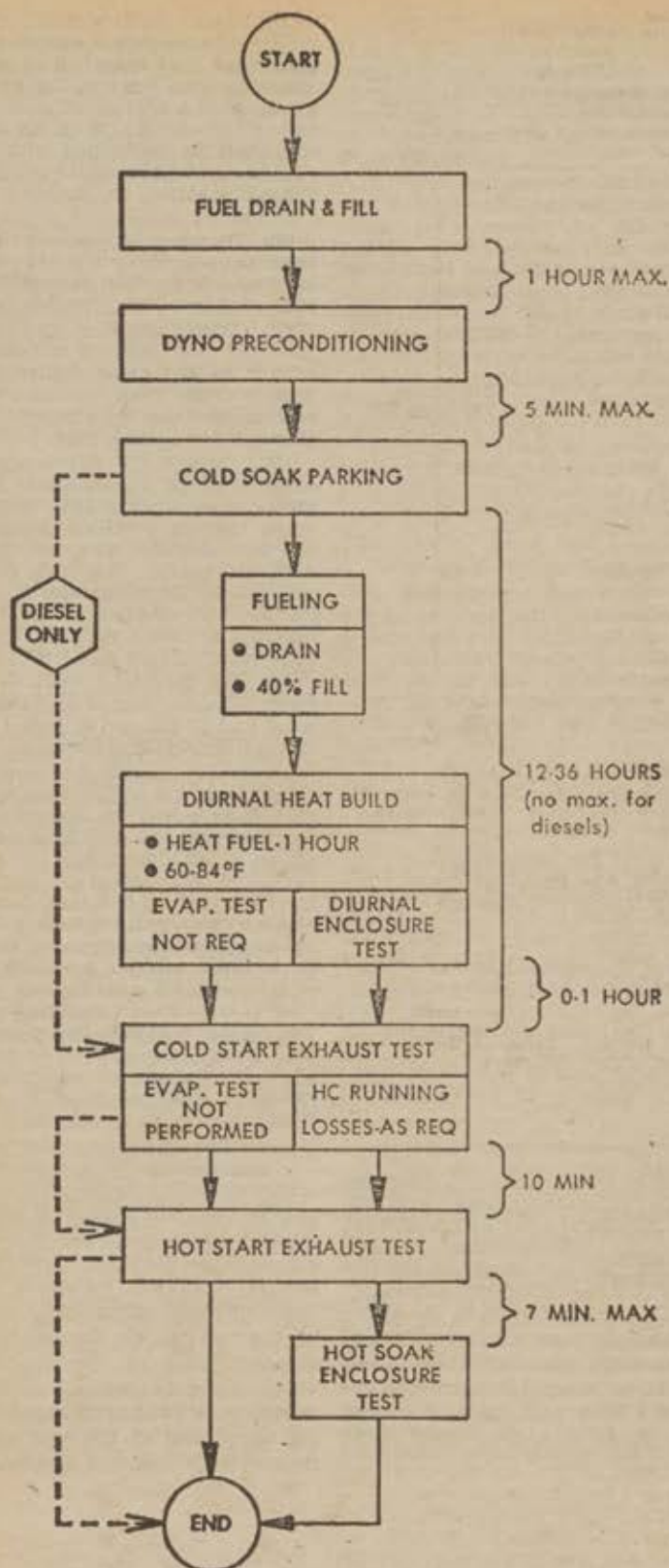


FIGURE B78-10 TEST SEQUENCE

§ 86.131-78 Vehicle preparation.

(a) For gasoline-fueled vehicles prepare the fuel tank(s) for recording the temperature of the prescribed test fuel at the approximate mid-volume of the fuel.

(b) Provide additional fittings and adapters, as required, to accommodate a fuel drain at the lowest point possible in the tank(s) as installed on the vehicle.

§ 86.132-78 Vehicle preconditioning.

(a) The vehicle shall be moved to the test area and the following operations performed:

(1) The fuel tank(s) shall be drained through the provided fuel tank(s) drain(s) and filled to the prescribed "tank fuel volume" with the specified test fuel, § 86.113. For the above operations the evaporative emission control system shall neither be abnormally purged nor abnormally loaded.

(2) Within one hour of being fueled the vehicle shall be placed, either by being driven or pushed, on a dynamometer and operated through one UDDS test procedure, see § 86.115 and Appendix I. A gasoline-fueled test vehicle may not be used to set dynamometer horsepower.

(3) For those unusual circumstances where additional preconditioning is desired by the manufacturer, such preconditioning may be allowed with the advance approval of the Administrator. The Administrator may also choose to conduct or require the conduct of additional preconditioning to insure that the evaporative emission control system is stabilized. The additional preconditioning shall consist of an initial one hour minimum soak and, one, two or three driving cycles of the UDDS, as described in paragraph (a) (2) of this section, each followed by a soak of at least one hour with engine off, engine compartment cover closed and cooling fan off. The vehicle may be driven off the dynamometer following each UDDS for the soak period.

(b) Within five minutes of completion of preconditioning the vehicle shall be driven off the dynamometer and parked. The vehicle shall be stored for not less than 12 hours nor for more than 36 hours (except Diesel vehicles which have no maximum time limitation) prior to the cold start exhaust test. (Gasoline-fueled vehicles undergo a one hour diurnal heat build prior to the cold start exhaust test. A wait of up to one hour is permitted between the end of the diurnal heat build and the beginning of the cold start exhaust test. See § 86.130 and Figure B78-10.)

(c) Vehicles to be tested for evaporative emissions shall be processed in accordance with procedures in §§ 86.133 through 86.138. Vehicles to be tested for exhaust emissions only shall be processed according to §§ 86.133 through 86.137.

§ 86.133-78 Diurnal breathing loss test.

(a) (1) Following vehicle preparation and vehicle preconditioning procedures described in §§ 86.131 and 86.132 the test

vehicle shall be allowed to soak for a period of not less than 12 or more than 36 hours prior to the exhaust emission test. The diurnal test shall start not less than 10 or more than 35 hours after the end of the preconditioning procedure. The start of the exhaust test shall follow the end of the diurnal test within one hour.

(2) Gasoline-fueled vehicles to be tested for exhaust emissions only shall undergo the diurnal heat build. Since no evaporative measurements are necessary, an evaporative enclosure is not required.

(b) The evaporative emission enclosure shall be purged for several minutes immediately prior to the test.

NOTE.—If at anytime the hydrocarbon concentration exceeds 15,000 ppm C the enclosure should be immediately purged. This concentration provides a 4:1 safety factor against the lean flammability limit.

(c) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the test.

(d) If not already on, the evaporative enclosure mixing fan shall be turned on at this time.

(e) Immediately prior to the diurnal breathing loss test, the fuel tank(s) of the prepared vehicle shall be drained and recharged with the specified test fuel, § 86.113, to the prescribed "tank fuel volume," defined in § 86.078-2. The temperature of the fuel prior to its delivery to the fuel tank shall be between 50 and 60° F (10 and 16° C). The fuel tank cap(s) is not installed until the diurnal heat build begins.

(f) The test vehicle, with the engine shut off, shall be moved into the evaporative emission enclosure, the test vehicle windows and luggage compartments shall be opened, the fuel tank temperature sensor shall be connected to the temperature recording system, and, if required, the heat source shall be properly positioned with respect to the fuel tank(s) and/or connected to the temperature controller.

(g) The temperature recording system shall be started.

(h) The fuel may be artificially heated to the starting diurnal temperature.

(i) When the fuel temperature recording system reaches at least 58° F (14° C), immediately:

- (1) Install fuel tank cap(s).
- (2) Turn off purge blowers, if not already off at this time.
- (3) Close and seal enclosure doors.

(j) When the fuel temperature recording system reaches 60±2° F (16±1.1° C), immediately:

(1) Analyze enclosure atmosphere for hydrocarbons and record. This is the initial (time=0 minutes) hydrocarbon concentration, C_{HOI} , § 86.143.

(2) Start diurnal heat build and record time. This commences the 60±2 minute test period.

(k) The fuel shall be heated in such a way that its temperature change conforms to the following function to within ±3° F (±1.6° C):

$$F = T_0 + 0.4t$$

for SI units, $C = T_0 + (2/9)t$

Where:

F=fuel temperature, ° F
C=fuel temperature, ° C
t=time since beginning of test, minutes.
 T_0 =initial temperature.

After 60±2 minutes of heating, the fuel temperature rise shall be 24±1° F (−4° C (±0.5° C)).

(l) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the end of the diurnal test.

(m) The end of the diurnal breathing loss test occurs 60±2 minutes after the heat build begins, paragraph (j)(2). Analyze the enclosure atmosphere for hydrocarbons and record. This is the final (time=60 minutes) hydrocarbon concentration, C_{HOE} , § 86.143. The time (or elapsed time) of this analysis shall be recorded.

(n) The heat source shall be turned off and the enclosure doors unsealed and opened.

(o) The heat source shall be moved away from the vehicle, if required, and/or disconnected from the temperature controller, the fuel tank temperature sensor shall be disconnected from the temperature recording system, the test vehicle windows and luggage compartments may be closed and the test vehicle, with the engine shut off, shall be removed from the evaporative emission enclosure.

(p) For vehicles with multiple tanks, the largest tank shall be designated as the primary tank and shall be heated in accordance with the procedures described in paragraph (k) of this section. All other tanks shall be designated as auxiliary tanks and shall undergo a similar heat build such that the fuel temperature shall be within 3° F (1.6° C) of the primary tank.

§ 86.134-78 Running loss test.

(a) If an engineering analysis or vehicle inspection indicates the possibility of evaporative emissions during vehicle operation, evaporative emission running loss measurements shall be made during the cold transient and stabilized portion of the exhaust emission test. Since running loss measurements cannot be made in the enclosure, the equipment described in § 86.177-17 shall be used to collect these emissions.

(1) The procedure in § 86.135 shall be followed.

(2) Prior to the initiation of the cold start exhaust emission test, the vapor loss measurement system shall be connected to all suspected sources of running loss evaporative emissions.

(3) The cold start transient and stabilized exhaust emission test portions shall be conducted according to the procedures of § 86.135 through § 86.137.

(4) Within one minute after the end of the stabilized exhaust emission test, the vapor loss measurement system shall be disconnected from the vehicle and the inlets and outlets sealed.

(5) Within one hour from the end of the running loss measurement, weigh the vapor collection traps.

§ 86.135-78 Dynamometer procedure.

(a) The dynamometer run consists of two tests, a "cold" start test after a minimum 12-hour and a maximum 36-hour soak according to the provisions of §§ 86.132 and 86.133 and a "hot" start test following the "cold" start test by 10 minutes. Engine startup (with all accessories turned off), operation over the driving schedule, and engine shutdown make a complete cold start test. Engine startup and operation over the first 505 seconds of the driving schedule complete the hot start test. The exhaust emissions are diluted with ambient air and a continuously proportional sample is collected for analysis during each phase. The composite samples collected in bags are analyzed for hydrocarbons (except diesel hydrocarbons which are analyzed continuously), carbon monoxide, carbon dioxide, and oxides of nitrogen. A parallel sample of the dilution air is similarly analyzed for hydrocarbon, carbon monoxide, carbon dioxide, and oxides of nitrogen.

(b) During dynamometer operation, a fixed speed cooling fan shall be positioned so as to direct cooling air to the vehicle in an appropriate manner with the engine compartment cover open. In the case of vehicles with front engine compartments, the fan shall be squarely positioned within 12 inches of the vehicle. In the case of vehicles with rear engine compartments (or if special designs make the above impractical), the cooling fan shall be placed in a position to provide sufficient air to maintain vehicle cooling. The fan capacity shall normally not exceed 5,300 cfm (2.50 m³/s). If, however, the manufacturer can show that during field operation the vehicle receives additional cooling, and that such additional cooling is needed to provide a representative test, the fan capacity may be increased or additional fans used if approved in advance by the Administrator.

(c) The vehicle speed as measured from the dynamometer rolls shall be used. A speed vs. time recording, as evidence of dynamometer test validity, shall be supplied on request of the Administrator.

(d) Practice runs over the prescribed driving schedule may be performed at test points, provided an emission sample is not taken, for the purpose of finding the minimum throttle action to maintain the proper speed-time relationship, or to permit sampling system adjustments.

NOTE.—When using two-roll dynamometers a truer speed-time trace may be obtained by minimizing the rocking of the vehicle in the rolls. The rocking of the vehicle changes the tire rolling radius on each roll. This rocking may be minimized by restraining the vehicle horizontally (or nearly so) by using a cable and winch.

(e) The drive wheel tires may be inflated up to a gauge pressure of 45 psi (310 kPa) in order to prevent tire damage. The drive wheel tire pressure shall be reported with the test results.

(f) If the dynamometer has not been operated during the 2-hour period im-

mediately preceding the test it shall be warmed up for 15 minutes by operating at 30 mph (48 km/h) using a non-test vehicle or as recommended by the dynamometer manufacturer.

(g) If the dynamometer horsepower must be adjusted manually, it shall be set within 1 hour prior to the exhaust emissions test phase. The test vehicle shall not be used to make the adjustment. Dynamometers using automatic control of preselectable power settings may be set anytime prior to the beginning of the emissions test.

(h) The driving distance as measured by counting the number of dynamometer roll or shaft revolutions, shall be determined for the transient cold start, stabilized cold start, and transient hot start phases of the test. The revolutions shall be measured on the same roll or shaft used for measuring the vehicle's speed.

§ 86.135-79 Dynamometer procedure.

(a) The dynamometer run consists of two tests, a "cold" start test after a minimum 12-hour and a maximum 36-hour soak according to the provisions of §§ 86.132 and 86.133 and a "hot" start test following the "cold" start test by 10 minutes. Engine startup (with all accessories turned off), operation over the driving schedule, and engine shutdown make a complete cold start test. Engine startup and operation over the first 505 seconds of the driving schedule complete the hot start test. The exhaust emissions are diluted with ambient air and a continuously proportional sample is collected for analysis during each phase. The composite samples collected in bags are analyzed for hydrocarbons (except diesel hydrocarbons which are analyzed continuously), carbon monoxide, carbon dioxide, and oxides of nitrogen. A parallel sample of the dilution air is similarly analyzed for hydrocarbon, carbon monoxide, carbon dioxide, and oxides of nitrogen.

(b) During dynamometer operation, a fixed speed cooling fan shall be positioned so as to direct cooling air to the vehicle in an appropriate manner with the engine compartment cover open. In the case of vehicles with front engine compartments, the fan shall be squarely positioned within 12 inches of the vehicle. In the case of vehicles with rear engine compartments (or if special designs make the above impractical), the cooling fan shall be placed in a position to provide sufficient air to maintain vehicle cooling. The fan capacity shall normally not exceed 5,300 cfm (2.50 m³/s). If, however, the manufacturer can show that during field operation the vehicle receives additional cooling, and that such additional cooling is needed to provide a representative test, the fan capacity may be increased or additional fans used if approved in advance by the Administrator.

(c) The vehicle speed as measured from the dynamometer rolls shall be used. A speed vs. time recording, as evidence of dynamometer test validity, shall be supplied on request of the Administrator.

(d) Practice runs over the prescribed driving schedule may be performed at test points, provided an emission sample is not taken, for the purpose of finding the minimum throttle action to maintain the proper speed-time relationship, or to permit sampling system adjustments.

NOTE.—When using two-roll dynamometers a truer speed-time trace may be obtained by minimizing the rocking of the vehicle in the rolls. The rocking of the vehicle changes the tire rolling radius on each roll. This rocking may be minimized by restraining the vehicle horizontally (or nearly so) by using a cable and winch.

(e) The drive wheel tires may be inflated up to a gauge pressure of 45 psi (310 kPa) in order to prevent tire damage. The drive wheel tire pressure shall be reported with the test results.

(f) If the dynamometer has not been operated during the 2-hour period immediately preceding the test it shall be warmed up for 15 minutes by operating at 30 mph (48 km/h) using a non-test vehicle or as recommended by the dynamometer manufacturer.

(g) If the dynamometer horsepower must be adjusted manually, it shall be set within 1 hour prior to the exhaust emissions test phase. The test vehicle shall not be used to make the adjustment. Dynamometers using automatic control of preselectable power settings may be set anytime prior to the beginning of the emissions test.

(h) The driving distance as measured by counting the number of dynamometer roll or shaft revolutions, shall be determined for the transient cold start, stabilized cold start, and transient hot start phases of the test. The revolutions shall be measured on the same roll or shaft used for measuring the vehicle's speed.

(i) Four wheel drive vehicles will be tested in a two wheel drive mode of operation. Full time four wheel drive vehicles will have one set of drive wheels temporarily disengaged by the vehicle manufacturer. Four wheel drive vehicles which can be manually shifted to a two wheel drive mode will be tested in the normal on-highway two wheel drive mode of operation.

§ 86.136-78 Engine starting and restarting.

(a) *Gasoline-fueled vehicles.* This paragraph (a) applies to gasoline-fueled vehicles.

(1) The engine shall be started according to the manufacturer's recommended starting procedures in the owner's manual. The initial 20-second idle period shall begin when the engine starts.

(2) Choke operation: (i) Vehicles equipped with automatic chokes shall be operated according to the manufacturer's operating instructions in the owner's manual, including choke setting and "kick-down" from cold fast idle.

(ii) Vehicles equipped with manual chokes shall be operated according to the manufacturer's operating instructions in the owner's manual.

(3) The transmission shall be placed in gear 15 seconds after the engine is started. If necessary, braking may be

employed to keep the drive wheels from turning.

(4) The operator may use the choke, accelerator pedal, etc. where necessary to keep the engine running.

(5) If the manufacturer's operating instructions in the owner's manual do not specify a warm engine starting procedure, the engine (automatic- and manual-choke engines) shall be started by depressing the accelerator pedal about half way and cranking the engine until it starts.

(b) *Diesel vehicles.* The engine shall be started according to the manufacturer's recommended starting procedures in the owner's manual. The initial 20-second idle period shall begin when the engine starts. The transmission shall be placed in gear 15 seconds after the engine is started. If necessary, braking may be employed to keep the drive wheels from turning.

(c) If the vehicle does not start after 10 seconds of cranking, cranking shall cease and the reason for failure to start shall be determined. The gas flow measuring device (or revolution counter) on the constant volume sampler (and the hydrocarbon integrator when testing Diesel vehicles, see § 85.135 Dynamometer Test Runs) shall be turned off and the sampler selector valves placed in the "standby" position during this diagnostic period. In addition, either the CVS should be turned off or the exhaust tube disconnected from the tailpipe during the diagnostic period. If failure to start is an operational error, the vehicle shall be rescheduled for testing from a cold start.

(1) If a failure to start occurs during the cold portion of the test and is caused by a vehicle malfunction, corrective action of less than 30 minutes duration may be taken (according to § 86.078-25), and the test continued. The sampling system shall be reactivated at the same time cranking begins. When the engine starts, the driving schedule timing sequence shall begin. If failure to start is caused by vehicle malfunction and the vehicle cannot be started, the test shall be voided, the vehicle removed from the dynamometer, and corrective action may be taken according to § 86.078-25. The reasons for the malfunction (if determined) and the corrective action taken shall be reported to the Administrator.

(2) If a failure to start occurs during the hot start portion of the test and is caused by vehicle malfunction, the vehicle must be started within one minute of key on. The sampling system shall be reactivated at the same time cranking begins. When the engine starts, the driving schedule timing sequence shall begin. If the vehicle cannot be started within one minute of key on, the test shall be voided, the vehicle removed from the dynamometer, corrective action taken, (according to § 86.078-25), and the vehicle rescheduled for testing. The reason for the malfunction (if determined) and the corrective action taken shall be reported to the Administrator.

(d) If the engine "false starts," the operator shall repeat the recommended starting procedure (such as resetting the choke, etc.).

(e) *Stalling*: (1) If the engine stalls during an idle period, the engine shall be restarted immediately and the test continued. If the engine cannot be started soon enough to allow the vehicle to follow the next acceleration as prescribed, the driving schedule indicator shall be stopped. When the vehicle restarts, the driving schedule indicator shall be reactivated.

(2) If the engine stalls during some operating mode other than idle, the driving schedule indicator shall be stopped, the vehicle shall then be restarted and accelerated to the speed required at that point in the driving schedule and the test continued. During acceleration to this point, shifting shall be performed in accordance with § 86.128.

(3) If the vehicle will not restart within one minute, the test shall be voided, the vehicle removed from the dynamometer, corrective action taken, and the vehicle rescheduled for test. The reason for the malfunction (if determined) and the corrective action taken shall be reported to the Administrator.

§ 86.137-78 Dynamometer test runs.

(a) The vehicle shall be allowed to stand with the engine turned off for a period of not less than 12 hours or more than 36 hours before the cold start exhaust emission test. The cold start exhaust test shall follow the diurnal breathing loss test by not more than one hour. The vehicle shall be stored prior to the emission test in such a manner that precipitation (e.g., rain or dew) does not occur on the vehicle. The complete dynamometer test consists of a cold start drive of 7.5 miles (12.1 km) and simulates a hot start drive of 7.5 miles (12.1 km). The vehicle is allowed to stand on the dynamometer during the 10-minute time period between the cold and hot start tests. The cold start test is divided into two periods. The first period, representing the cold start "transient" phase, terminates at the end of the deceleration which is scheduled to occur at 505 seconds of the driving schedule. The second period, representing the "stabilized" phase, consists of the remainder of the driving schedule including engine shutdown. The hot start test similarly consists of two periods. The period, representing the hot start "transient" phase, terminates at the same point in the driving schedule as the first period of the cold start test. The second period of the hot start test, "stabilized" phase, is assumed to be identical to the second period of the cold start test. Therefore, the hot start test terminates after the first period (505 seconds) is run.

(b) The following steps shall be taken for each test:

(1) Place drive wheels of vehicle on dynamometer without starting engine. Reset and engage the roll revolution counter.

(2) Open the vehicle engine compartment cover and position the cooling fan.

(3) With the sample selector valves in the "standby" position, connect evacuated sample collection bags to the dilute exhaust and dilution air sample collection systems.

(4) Start the CVS (if not already on), the sample pumps, the temperature recorder, the vehicle cooling fan and the heated hydrocarbon analysis recorder (Diesel only). (The heat exchanger of the constant volume sampler, if used, Diesel hydrocarbon analyzer continuous sample line and filter (if applicable) should be preheated to their respective operating temperatures before the test begins.)

(5) Adjust the sample flow rates to the desired flow rate (minimum of 10 cfm, 0.28 m³/hr) and set the gas flow measuring devices to zero.

NOTE.—CFV-CVS sample flowrate is fixed by the venturi design.

(6) Attach the flexible exhaust tube to the vehicle tailpipe(s).

(7) Start the gas flow measuring device, position the sample selector valves to direct the sample flow into the "transient" exhaust sample bag and the "transient" dilution air sample bag (turn on the Diesel hydrocarbon analyzer system integrator and mark the recorder chart, if applicable), turn the key on, and start cranking the engine.

(8) Fifteen seconds after the engine starts, place the transmission in gear.

(9) Twenty seconds after the engine starts, begin the initial vehicle acceleration of the driving schedule.

(10) Operate the vehicle according to the dynamometer driving schedule (§ 86.115).

(11) At the end of the deceleration which is scheduled to occur at 505 seconds, simultaneously switch the sample flows from the "transient" bags to the "stabilized" bags, switch off gas flow measuring device No. 1 (and the Diesel hydrocarbon integrator No. 1, mark the Diesel hydrocarbon recorder chart) and start gas flow measuring device No. 2 (and Diesel hydrocarbon integrator No. 2). Before the acceleration which is scheduled to occur at 510 seconds, record the measured roll or shaft revolutions and reset the counter or switch to a second counter. As soon as possible transfer the "transient" exhaust and dilution air samples to the analytical system and process the samples according to § 86.140 obtaining a stabilized reading of the exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test.

(12) Turn the engine off 2 seconds after the end of the last deceleration (at 1,369 seconds).

(13) Five seconds after the engine stops running, simultaneously turn off gas flow measuring device No. 2 (and the Diesel hydrocarbon integrator No. 2, mark the hydrocarbon recorder chart, if applicable) and position the sample selector valves to the "standby" position. Record the measured roll or shaft revolutions and reset the counter. As soon as possible transfer the "stabilized" exhaust and dilution air samples to the analytical system and process the samples according to § 86.140 obtaining a stabilized reading of the exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test.

(14) Immediately after the end of the sample period turn off the cooling fan and close the engine compartment cover.

(15) Turn off the CVS or disconnect the exhaust tube from the tailpipe of the vehicle.

(16) Repeat the steps in paragraph (b) (2) through (10) of this section for the hot-start test, except only one evacuated sample bag is required for sampling exhaust gas and one for dilution air. The key-on operation step described in paragraph (b) (7) of this section shall begin between 9 and 11 minutes after the end of the sample period for the cold-start test.

(17) At the end of the deceleration which is scheduled to occur at 505 seconds, simultaneously turn off gas flow measuring device No. 1 (and Diesel hydrocarbon integrator No. 1, mark the Diesel hydrocarbon recorder chart, if applicable) and position the sample selector valve to the "standby" position. (Engine shutdown is not part of the hot start test sample period.) Record the measured roll or shaft revolutions.

(18) As soon as possible transfer the hot start "transient" exhaust and dilution air samples to the analytical system and process the samples according to § 86.140 obtaining a stabilized reading of the exhaust sample on all analyzers within 20 minutes of the end of the sample collection phase of the test.

(19) Disconnect the exhaust tube from the vehicle tailpipe(s) and drive vehicle from dynamometer.

(20) The CVS may be turned off, if desired.

(21) Vehicles to be tested for evaporative emissions will proceed according to § 86.138. For all others this completes the test sequence.

§ 86.138-78 Hot-soak test.

The hot-soak evaporative emission test shall be conducted immediately following the hot transient exhaust emission test.

(a) Prior to the completion of the hot-start transient exhaust emission sampling period, the evaporative emission enclosure shall be purged for several minutes.

(b) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the test.

(c) If not already on, the evaporative enclosure mixing fan shall be turned on at this time.

(d) Upon completion of the hot transient exhaust emission sampling period, the vehicle engine compartment cover shall be closed, the cooling fan shall be moved, the vehicle shall be disconnected from the dynamometer and exhaust sampling system, and then driven at minimum throttle to the vehicle entrance of the enclosure.

(e) The vehicle's engine must be stopped before any part of the vehicle enters the enclosure. The vehicle may be pushed or coasted into the enclosure.

(f) The test vehicle windows and luggage compartments shall be opened, if not already open.

(g) The temperature recording system shall be started and the time of engine

shut off shall be noted on the evaporative emission hydrocarbon data recording system.

(h) The enclosure doors shall be closed and sealed within two minutes of engine shutdown and within seven minutes after the end of the exhaust test.

(i) The 60±0.5 minute hot soak begins when the enclosure doors are sealed. The enclosure atmosphere shall be analyzed and recorded. This is the initial (time=0 minutes) hydrocarbon concentration, C_{HOI} , for use in calculating evaporative losses, see § 86.143.

(j) The test vehicle shall be permitted to soak for a period of one hour in the enclosure.

(k) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the end of the test.

(l) At the end of the 60±0.5 minute test period, again analyze the enclosure atmosphere and record time. This is the final (time=60 minutes) hydrocarbon concentration, C_{FOI} , for use in calculating evaporative losses, see § 86.143. This operation completes the evaporative emission measurement procedure.

§ 86.139-78 [Reserved]

§ 86.140-78 Exhaust sample analysis.

The following sequence of operations shall be performed in conjunction with each series of measurements:

(a) Zero the analyzers and obtain a stable zero reading. Recheck after tests.

(b) Introduce span gases and set instrument gains. In order to avoid corrections, span and calibrate at the same flow rates used to analyze the test sample. Span gases should have concentrations equal to 75 to 100 percent of full scale. If gain has shifted significantly on the analyzers, check the calibrations. Show actual concentrations on chart.

(c) Check zeros; repeat the procedure in paragraphs (a) and (b) of this section if required.

(d) Check flowrates and pressures.

(e) Measure HC, CO, CO₂, and NO_x concentrations of samples.

(f) For Diesel vehicles, continuously record (integrate electronically if desired) dilute hydrocarbon emission levels during test. Background samples are collected in sample bags and analyzed as above.

(g) Check zero and span points. If difference is greater than 2 percent of full scale, repeat the procedure in paragraphs (a) through (f) of this section.

§ 86.141-78 [Reserved]

§ 86.142-78 Records required.

The following information shall be recorded with respect to each test:

(a) Test number.

(b) System or device tested (brief description).

(c) Date and time of day for each part of the test schedule.

(d) Instrument operator.

(e) Driver or operator.

(f) Vehicle: ID number, Manufacturer, Model year, Standards, Engine family, Evaporative emissions family, Basic engine description (including displacement, number of cylinders, and catalysts us-

age), Fuel system (including number of carburetors, number of carburetor barrels, fuel injection type, and fuel tank(s) capacity and location), Engine code, Inertia weight class, Actual curb weight at zero miles, Actual road load at 50 mph, Transmission configuration, Axle ratio, Car line, Odometer reading, Idle rpm, and Drive wheel tire pressure, as applicable.

(g) Indicated road load power absorption at 50 mph (80 km/h) and dynamometer serial number. As an alternative to recording the dynamometer serial number, a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided the test cell records show the pertinent information.

(h) All pertinent instrument information such as tuning—gain—serial number—detector number—range. As an alternative, a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided test cell calibration records show the pertinent instrument information.

(i) Recorder charts: Identify zero, span, exhaust gas, and dilution air sample traces.

(j) Test cell barometric pressure, ambient temperature and humidity.

NOTE.—A central laboratory barometer may be used: *Provided*, That individual test cell barometric pressures are shown to be within ±0.1 percent of the barometric pressure at the central barometer location.

(k) Fuel temperatures, as prescribed.

(l) Pressure of the mixture of exhaust and dilution air entering the CVS metering device, the pressure increase across the device, and the temperature at the inlet. The temperature may be recorded continuously or digitally to determine temperature variations.

(m) The number of revolutions of the positive displacement pump accumulated during each test phase while exhaust samples are being collected. The number of standard cubic feet metered by a critical flow venturi during each test phase would be the equivalent record for a CFV-CVS.

(n) The humidity of the dilution air.

NOTE.—If conditioning columns are not used (see § 86.122 and § 86.144) this measurement can be deleted. If the conditioning columns are used and the dilution air is taken from the test cell, the ambient humidity can be used for this measurement.

(o) Temperature set point of the heated sample line and heated hydrocarbon detector temperature control system (for Diesel vehicles only).

(p) The driving distance for each of the three phases of the test, calculated from the measured roll of shaft revolutions.

§ 86.142-79 Records required.

The following information shall be recorded with respect to each test:

(a) Test number.

(b) System or device tested (brief description).

(c) Date and time of day for each part of the test schedule.

(d) Instrument operator.

(e) Driver or operator.

(f) Vehicle: ID number, Manufacturer, Model year, Standards, Engine family, Evaporative emissions family, Basic engine description (including displacement, number of cylinders, and catalyst usage), Fuel system (including number of carburetors, number of carburetor barrels, fuel injection type, and fuel tank(s) capacity and location), Engine code, Gross vehicle weight rating, Inertia weight class, Actual curb weight at zero miles, Actual road load at 50 mph, Transmission configuration, Axle ratio, Car line, Odometer reading, Idle rpm and Drive wheel tire pressure, as applicable.

(g) Indicated road load power absorption at 50 mph (80 km/h) and dynamometer serial number. As an alternative to recording the dynamometer serial number, a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided the test cell records show the pertinent information.

(h) All pertinent instrument information such as tuning—gain—serial number—detector number—range. As an alternative, a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided test cell calibration records show the pertinent instrument information.

(i) Recorder charts: Identify zero, span, exhaust gas, and dilution air sample traces.

(j) Test cell barometric pressure, ambient temperature and humidity.

NOTE.—A central laboratory barometer may be used: *Provided*, That individual test cell barometric pressures are shown to be within ±0.1 percent of the barometric pressure at the central barometer location.

(k) Fuel temperatures, as prescribed.

(l) Pressure of the mixture of exhaust and dilution air entering the CVS metering device, the pressure increase across the device, and the temperature at the inlet. The temperature may be recorded continuously or digitally to determine temperature variations.

(m) The number of revolutions of the positive displacement pump accumulated during each test phase while exhaust samples are being collected. The number of standard cubic feet metered by a critical flow venturi during each test phase would be the equivalent record for a CFV-CVS.

(n) The humidity of the dilution air.

NOTE.—If conditioning columns are not used (see § 86.122 and § 86.144) this measurement can be deleted. If the conditioning columns are used and the dilution air is taken from the test cell, the ambient humidity can be used for this measurement.

(o) Temperature set point of the heated sample line and heated hydrocarbon detector temperature control system (for Diesel vehicles only).

(p) The driving distance for each of the three phases of the test, calculated from the measured roll of shaft revolutions.

§ 86.143-78 Calculations; evaporative emissions.

The calculation of the net hydrocarbon mass change in the enclosure is used to determine the diurnal and hot soak mass emissions. The mass is calculated from initial and final hydrocarbon concentrations in ppm carbon, initial and final enclosure ambient temperatures, initial and final barometric pressures, and net enclosure volume using the following equation:

$$M_{HC} = kV_n \times 10^{-4} \left[\frac{C_{HCi} P_{Bf}}{T_f} - \frac{C_{HCi} P_{Bi}}{T_i} \right]$$

Where:

- M_{HC}=hydrocarbon mass, g.
- C_{HC}=hydrocarbon concentration as ppm carbon.
- V_n=net enclosure volume, ft³ (m³) as determined by subtracting 50 ft³ (1.42 m³) (volume of vehicle with trunk and windows open) from the enclosure volume. A manufacturer may use the measured volume of the vehicle (instead of the nominal 50 ft³) with advance approval by the Administrator; *Provided*, The measured volume is determined and used for all vehicles tested by that manufacturer.
- P_B=barometric pressure, in. Hg (kPa).
- T=enclosure ambient temperature, R (K).
- k=208 (12+H/C) for SI units, k=1.2 (12+H/C).

Where:

- H/C=Hydrogen-carbon ratio.
- H/C=2.33 for diurnal emissions.
- H/C=2.2 for hot soak emissions.
- i=indicates initial reading.
- f=indicates final reading.

The final reported results shall be computed by summing the individual evaporative emission results determined for the diurnal breathing-loss test, running-loss test, and the hot-soak test.

§ 86.144-78 Calculations; exhaust emissions.

The final reported test results shall be computed by use of the following formula:

(a) For light-duty vehicles and light-duty trucks:

$$Y_{em} = 0.43 \left(\frac{Y_{st} + Y_{d}}{D_{st} + D_d} \right) + 0.57 \left(\frac{Y_{st} + Y_{d}}{D_{st} + D_d} \right)$$

Where:

- Y_{em}=Weighted mass emissions of each pollutant, i.e., HC, CO, NO_x or CO₂, in grams per vehicle mile.
- Y_{st}=Mass emissions as calculated from the "transient" phase of the cold start test, in grams per test phase.
- Y_d=Mass emissions as calculated from the "transient" phase of the hot start test, in grams per test phase.
- Y_s=Mass emissions as calculated from the "stabilized" phase of the cold start test, in grams per test phase.
- D_{st}=The measured driving distance from the "transient" phase of the cold start test, in miles.
- D_d=The measured driving distance from the "transient" phase of the hot start test, in miles.
- D_s=The measured driving distance from the "stabilized" phase of the cold start test, in miles.

(b) The mass of each pollutant for each phase of both the cold start test and the hot start test is determined from the following:

(1) Hydrocarbon mass:

$$HC_{mass} = V_{mix} \times \text{Density}_{HC} \times (HC_{emiss}/1,000,000)$$

(2) Oxides of nitrogen mass:

$$NO_{xmass} = V_{mix} \times \text{Density}_{NO_x} \times K_H \times (NO_{xemiss}/1,000,000)$$

(3) Carbon monoxide mass:

$$CO_{mass} = V_{mix} \times \text{Density}_{CO} \times (CO_{emiss}/1,000,000)$$

(4) Carbon dioxide mass:

$$CO_{2mass} = V_{mix} \times \text{Density}_{CO_2} \times (CO_{2emiss}/100)$$

(c) Meaning of symbols:

- (1) HC_{emiss}=Hydrocarbon emissions, in grams per test phase.
- Density_{HC}=Density of hydrocarbons is 16.33 g/ft³ (5767 kg/m³), assuming an average carbon to hydrogen ratio of 1:1.85, at 68° F (20° C) and 760 mm Hg (101.3 kPa) pressure.
- HC_{emiss}=Hydrocarbon concentration of the dilute exhaust sample corrected for background, in ppm carbon equivalent, i.e., equivalent propane × 3.
- HC_{emiss}=HC_{emiss} - HC_{air} (1-1/DF)

Where:

- HC_{emiss}=Hydrocarbon concentration of the dilute exhaust sample or, for Diesel, average hydrocarbon concentration of the dilute exhaust sample as calculated from the integrated HC traces, in ppm carbon equivalent.
- HC_{air}=Hydrocarbon concentration of the dilution air as measured, in ppm carbon equivalent.
- (2) NO_{xemiss}=Oxides of nitrogen emissions, in grams per test phase.
- Density_{NO_x}=Density of oxides of nitrogen is 54.16 g/ft³ (1.913 kg/m³), assuming they are in the form of nitrogen dioxide, at 68° F (20° C) and 760 mm Hg (101.3 kPa) pressure.
- NO_{xemiss}=Oxides of nitrogen concentration of the dilute exhaust sample corrected for background, in ppm.
- NO_{xemiss}=NO_x - NO_x (1-1/DF)

Where:

- NO_x=Oxides of nitrogen concentration of the dilute exhaust sample as measured, in ppm.
- NO_x=Oxides of nitrogen concentration of the dilute air as measured, in ppm.
- (3) CO_{emiss}=Carbon monoxide emissions, in grams per test phase.
- Density_{CO}=Density of carbon monoxide is 32.97 g/ft³ (1.164 kg/m³), at 68° F (20° C) and 760 mm Hg (101.3 kPa) pressure.
- CO_{emiss}=Carbon monoxide concentration of the dilute exhaust sample corrected for background, water vapor, and CO₂ extraction, in ppm.
- CO_{emiss}=CO_{emiss} - CO₂ (1-1/DF)

Where:

- CO_{emiss}=Carbon monoxide concentration of the dilute exhaust sample volume corrected for water vapor and carbon dioxide extraction, in ppm. The calculation assumes the carbon to hydrogen ratio of the fuel is 1:1.85.
- CO_{emiss}=(1-0.01925 CO₂ - 0.000323 R) CO_{emiss}

Where:

- CO_{emiss}=Carbon monoxide concentration of the dilute exhaust sample as measured, in ppm.
- CO₂=Carbon dioxide concentration of the dilute exhaust sample, in percent.
- R=Relative humidity of the dilution air, in percent (see § 86.142(n)).
- CO₂=Carbon monoxide concentration of the dilution air corrected for water vapor extraction, in ppm.
- CO₂=(1-0.000323 R) CO₂

Where:

CO_{emiss}=Carbon monoxide concentration of the dilution air sample as measured, in ppm.

Note.—If a CO instrument which meets the criteria specified in § 86.111 is used and the conditioning column has been deleted, CO_{emiss} can be substituted directly for CO_{emiss} and CO_{2emiss} can be substituted directly for CO_{2emiss}.

- (4) CO_{2emiss}=Carbon dioxide emissions, in grams per test phase.
- Density_{CO₂}=Density of carbon dioxide is 51.85 g/ft³ (1.843 kg/m³), at 68° F (20° C) and 760 mm Hg (101.3 kPa) pressure.
- CO_{2emiss}=Carbon dioxide concentration of the dilute exhaust sample corrected for background, in percent.
- CO_{2emiss}=CO_{2emiss} - CO₂ (1-1/DF)

Where:

- CO_{2emiss}=Carbon dioxide concentration of the dilution air as measured, in percent.
- (5) DF=13.4/[CO₂ + (HC_{emiss} + CO_{emiss}) 10⁻⁴]
- K_H=Humidity correction factor.
- K_H=1/[1-0.0047(H-75)] for SI units=1/[1-0.9329(H-10.71)]

Where:

- H=Absolute humidity in grains (grams) of water per pound (kilogram) of dry air.
- H=[(43.478)R_a × P_a]/[P_B - (P_a × R_a/100)] for SI units, H=[(6.211)R_a × P_a]/[P_B - (P_a × R_a/100)]
- R_a=Relative humidity of the ambient air, in percent.
- P_a=Saturated vapor pressure, in mm Hg (kPa) at the ambient dry bulb temperature.
- P_B=Barometric pressure, in mm Hg (kPa).
- V_{mix}=Total dilute exhaust volume in cubic feet per test phase corrected to standard conditions (528 R) (293 K) and 760 mm Hg (101.3 kPa).
- For PDP-CVS, V_{mix} is:

$$V_{mix} = V_p \times \frac{N(P_B - P_d) 528 R}{(760 \text{ mm Hg}) (T_p)}$$

for SI units,

$$V_{mix} = V_p \times \frac{N(P_B - P_d) (293.15 K)}{(101.325 \text{ kPa}) (T_p)}$$

Where:

- V_p=Volume of gas pumped by the positive displacement pump, in cubic feet (m³) per revolution. This volume is dependent on the pressure differential across the positive displacement pump.
- N=Number of revolutions of the positive displacement pump during the test phase while samples are being collected.
- P_B=Barometric pressure, in mm Hg (kPa).
- P_d=Pressure depression below atmospheric measured at the inlet to the positive displacement pump, in mm Hg (kPa) (during an idle mode).
- T_p=Average temperature of dilute exhaust entering positive displacement pump during test, R(K).

(d) Example calculation of mass values of exhaust emissions using positive displacement pump:

(1) For the "transient" phase of the cold start test assume the following: V_p=0.29344 ft³/revolution; N=10,485; R=48.0 percent; R_a=48.2 percent; P_B=762 mm Hg; P_d=22.225 mm Hg; P_a=70 mm Hg; T_p=570 R; HC_{emiss}=105.8 ppm, carbon equivalent; NO_x=11.2 ppm; CO_{emiss}=306.6 ppm; CO₂=1.43 per-

cent; HC₂=12.1 ppm; NO_x=0.6 ppm;
CO₂=15.3 ppm.

CO₂=0.032 percent; D₂=3.598 miles.

Then:

$$V_{mix} = (0.29344) (10,485) (762-70) / (528) / (760) (870) = 2595.0 \text{ ft}^3 \text{ per test phase.}$$

$$H = (43.478) (48.2) (22.225) / (762 - (22.225 \times 48.2/100)) = 62 \text{ grains of water per pound of dry air}$$

$$K_H = 1 / [1 - 0.0047(62 - 75)] = 0.9424$$

$$CO_2 = [1 - 0.01925 (1.43) - 0.000323 (48)] 306.0 = 293.4 \text{ ppm}$$

$$CO_1 = [1 - 0.000323 (48)] 15.3 = 15.1 \text{ ppm}$$

$$DF = 13.4 / [1.43 + (105.8 + 293.4) \times 10^{-4}] = 9.116$$

$$HC_{cold} = 105.8 - 12.1(1 - 1/9.116) = 95.03 \text{ ppm}$$

$$HC_{mass} = (2595) (16.33) (95.03/1,000,000) = 4.027 \text{ grams per test phase.}$$

$$NO_{x,cold} = 11.2 - 0.8 (1 - 1/9.116) = 10.49 \text{ ppm}$$

$$NO_{x,mass} = (2595) (54.16) (10.49/1,000,000) (0.9424) = 1.389 \text{ grams per test phase.}$$

$$CO_{cold} = 293.4 - 15.1(1 - 1/9.116) = 280.0 \text{ ppm}$$

$$CO_{mass} = (2595) (32.97) (280/1,000,000) = 23.96 \text{ grams per test phase.}$$

$$CO_{2,cold} = 1.43 - 0.02 (1 - 1/9.116) = 1.402\%$$

$$CO_{2,mass} = (2595.0) (51.85) (1.402/100) = 1886 \text{ grams per test phase.}$$

(2) For the stabilized portion of the cold start test assume that similar calculations resulted in the following:

$$HC_{mass} = 0.62 \text{ grams per test phase}$$

$$NO_{x,mass} = 1.27 \text{ grams per test phase}$$

$$CO_{mass} = 5.98 \text{ grams per test phase}$$

$$CO_{2,mass} = 2346 \text{ grams per test phase.}$$

$$D_1 = 3.902 \text{ miles.}$$

(3) For the "transient" portion of the hot start test assume that similar calculations resulted in the following:

$$HC_{mass} = 0.51 \text{ grams per test phase}$$

$$NO_{x,mass} = 1.38 \text{ grams per test phase}$$

$$CO_{mass} = 5.01 \text{ grams per test phase}$$

$$CO_{2,mass} = 1758 \text{ grams per test phase.}$$

$$D_{31} = 3.598 \text{ miles.}$$

(4) Weighted mass emission results:

$$HC_{em} = 0.43 [(0.277 + 0.62) / (3.598 + 3.902)] + 0.57 [(0.51 + 0.62) / (3.598 + 3.902)] = 0.552 \text{ grams per vehicle mile.}$$

$$NO_{x,em} = 0.43 [(1.389 + 1.27) / (3.598 + 3.902)] + 0.57 [(1.38 + 1.27) / (3.598 + 3.902)] = 1.354 \text{ grams per vehicle mile.}$$

$$CO_{em} = 0.43 [(23.96 + 5.98) / (3.598 + 3.902)] + 0.57 [(5.01 + 5.98) / (3.598 + 3.902)] = 2.55 \text{ grams per vehicle mile.}$$

$$CO_{2,em} = 0.43 [(1886 + 2346) / (3.598 + 3.902)] + 0.57 [(1758 + 2346) / (3.598 + 3.902)] = 555 \text{ grams per vehicle mile.}$$

§ 86.145-78 [Reserved]

§§ 86.177-1-86.177-3 [Reserved]

§ 86.177-4 Section numbering; construction.

(a) The section numbering procedure specified in § 86.077-4(a) applies to §§ 86.177-5-86.177-23.

(b) Unless indicated otherwise, all provisions in this subpart apply to both gasoline-fueled and Diesel vehicles.

§ 86.177-5 Test procedures.

The procedures described in this and subsequent sections will be the test program to determine the conformity of vehicles with the standards set forth in §§ 86.077-8 and 86.077-9.

(a) Vehicles which are required to be tested for compliance with the exhaust and fuel evaporative emission stand-

ards of this subpart shall be tested according to the following procedures:

(1) The test consists of prescribed sequences of fueling, parking, and operating conditions. The exhaust gases generated during vehicle operation are diluted with air and sampled continuously for subsequent analysis of specific components by prescribed analytical techniques. The fuel evaporative emissions are collected for subsequent weighing during both vehicle parking and operating events. The test applies to vehicles equipped with catalytic or direct-flame afterburners, induction system modifications, or other systems or to uncontrolled vehicles and engines.

(2) The exhaust emission test is designed to determine hydrocarbon, carbon monoxide, and oxides of nitrogen mass emissions while simulating an average trip in an urban area of 7.5 miles. The test consists of engine startups and vehicle operation on a chassis dynamometer through a specified driving schedule, as described in Appendix I to this part. A proportional part of the diluted exhaust emissions is collected continuously for subsequent analysis using a constant volume (variable dilution) sampler.

(3) The fuel evaporative emission test is designed to determine fuel hydrocarbon evaporative emissions to the atmosphere as a consequence of urban driving and diurnal temperature fluctuations during parking. It is associated with a series of events representative of a motor vehicle's operation which result in fuel vapor losses directly from the fuel tank and carburetor. Activated carbon traps are employed in collecting the vaporized fuel. The test procedure is specifically aimed at collecting and weighing:

(i) Diurnal breathing losses from the fuel tank and other parts of the fuel system when the fuel tank is subjected to a temperature increase representative of the diurnal range;

(ii) Running losses from the fuel tank and carburetor resulting from a simulated trip on a chassis dynamometer; and

(iii) Hot soak losses from the fuel tank and carburetor which result when the vehicle is parked and the hot engine is turned off.

(4) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle shall be functioning during all procedures in this subpart. Maintenance to correct component malfunction or failure shall be authorized in accordance with § 86.077-25.

(b) Vehicles which are required to be tested for compliance only with the exhaust emission standards of this subpart shall be tested according to the following procedures:

(1) Gasoline-fueled vehicles (i) The test consists of prescribed sequences of fueling, parking, and operating conditions. The exhaust gases generated during vehicle operation are diluted with air and sampled continuously for subsequent analysis of specific components by prescribed analytical tech-

niques. The test applies to vehicles equipped with catalytic or direct-flame afterburners, induction system modifications, or other systems or to uncontrolled vehicles and engines.

(ii) The exhaust emission test is designed to determine hydrocarbon, carbon monoxide, and oxides of nitrogen mass emissions while simulating an average trip in an urban area of 7.5 miles. The test consists of engine startups and vehicle operation on a chassis dynamometer through a specified driving schedule, as described in Appendix I to this part. A proportional part of the diluted exhaust emissions is collected continuously, for subsequent analysis, using a constant volume (variable dilution) sampler.

(iii) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle shall be functioning during all procedures in this subpart. Maintenance to correct component malfunction or failure shall be authorized in accordance with § 86.077-25.

(2) Diesel vehicles. (i) The test consists of prescribed sequences of fueling, parking, and operating conditions. The exhaust gases generated during vehicle operation are diluted with air and sampled continuously for analysis of Diesel exhaust hydrocarbon and subsequent analysis of other specific components by prescribed techniques. The test applies to vehicles equipped with catalytic or direct flame after-burners, other control systems or to uncontrolled vehicles and engines. All test phases are conducted with an ambient temperature range between 68° and 86° F.

(ii) The exhaust emission test is designed to determine hydrocarbon, carbon monoxide, and oxides of nitrogen mass emissions while simulating an average trip in an urban area of 7.5 miles. The test consists of engine startups and vehicle operation on a chassis dynamometer through a specified driving schedule, as described in Appendix I to this part. Using a constant volume (variable dilution) sampler, a proportional part of the diluted exhaust gas is analyzed continuously for hydrocarbons and an additional proportional part of the diluted exhaust gas is collected in a bag for subsequent analysis of the other components.

(iii) Except for component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle shall be functioning during all procedures in this subpart. Component malfunction or failure shall be repaired in accordance with § 86.077-25.

§ 86.177-6 Fuel specifications.

(a) Gasoline. (1) Gasoline having the following specifications will be used by the Administrator in exhaust and evaporative emission testing. Gasoline having the following specifications or substantially equivalent specifications approved by the Administrator, shall be used by the manufacturer in exhaust and evaporative testing, except that the lead and octane specifications do not apply.

Item designation	ASTM	Leaded	Unleaded
Cetane, research, minimum	D 2992	100	98
Pb. (organic), grams/U.S. gallon		1.4 min.	0.00-0.5
Distillation range:			
IBP, °F	D86	75-95	75-95
10 percent point, °F	D86	120-135	120-135
50 percent point, °F	D86	200-220	200-230
90 percent point, °F	D86	300-325	300-325
EP, °F (maximum)	D86	415	415
Sulfur, weight percent, maximum	D1266	0.10	.10
Phosphorus, grams/U.S. gallon, maximum		.01	.005
EVP, ¹ pounds	D323	8.7-9.2	8.7-9.2
Hydrocarbon composition:			
Olefins, percent, maximum	D1319	10	
Aromatics, percent, maximum	D1319	35	35
Saturates	D1319	Remainder	Remainder

¹ For testing at altitudes above 1,219 meters (4,000 feet) the specified range is 75-105.
² For testing which is unrelated to fuel evaporative emission control, the specified range is 8-9.2.
³ For testing at altitudes above 1,219 meters (4,000 feet) the specified range is 7.9-9.2.

(2) Gasoline representative of commercial gasoline which will be generally available through retail outlets shall be used in mileage accumulation. For leaded gasoline, the minimum lead content shall be 1.4 grams per U.S. gallon, except that where the Administrator determines that vehicles represented by a test vehicle will be operated using gasoline of different lead content than that prescribed in this paragraph, he may consent in writing to use of a gasoline with a different lead content. The octane rating of the gasoline used shall be no higher than 4.0 research octane numbers above the minimum recommended by the manufacturer. The Reid Vapor Pressure of the gasoline used shall be characteristic of the motor fuel during the season in which the mileage accumulation takes place.

(3) The specification range of the gasoline to be used under paragraph (a) (2) of this section shall be reported in accordance with § 86.077-21(b) (3).
 (b) Diesel fuels. (1) The Diesel fuels employed for testing shall be clean and bright, with pour and cloud points adequate for operability. The fuels may contain nonmetallic additives as follows: Cetane improver, metal deactivator, anti-oxidant, dehazer, antirust, pour depressant, dye, and dispersant.
 (2) Diesel fuel meeting the following specifications, or substantially equivalent specifications approved by the Administrator, shall be used in exhaust emissions testing. The grade of fuel recommended by the engine manufacturer, commercially designated as "Type 1-D" or "Type 2-D," shall be used.

Item	ASTM test method No.	Type 1-D	Type 2-D
Cetane	D 613	48-54	42-50
Distillation range	D 86		
IBP, °F		330-390	340-400
10-pct point, °F		370-430	400-460
50-pct point, °F		410-480	470-540
90-pct point, °F		460-520	550-610
EP, °F		500-560	580-660
Gravity, °API	D 287	40-44	33-37
Total sulfur, percent	D 129 or D 3622	0.05-0.20	0.2-0.5
Hydrocarbon composition	D 1319		
Aromatics, percent		8-15	1-27
Paraffins, naphthenes, olefins		(¹)	(²)
Flashpoint, °F (minimum)	D 93	120	130
Viscosity, centistokes	D 445	1.6-2.0	2.0-3.2

¹ Minimum.
² Remainder.

(3) Diesel fuel meeting the following specifications, or substantially equivalent specifications approved by the Administrator, shall be used in service accumulation. The grade of fuel recommended by the engine manufacturer, commercially designated as "Type 1-D" or "Type 2-D," shall be used.

Item	ASTM test method No.	Type 1-D	Type 2-D
Cetane	D 613	48-54	43-55
Distillation range	D 86		
IBP, °F		330-390	340-410
10-pct point, °F		370-430	400-470
50-pct point, °F		410-480	470-540
90-pct point, °F		460-520	550-610
EP, °F		500-560	580-660
Gravity, °API	D 287	40-44	33-40
Total sulfur, percent	D 129 or D 2022	0.05-0.20	0.2-0.5
Flashpoint, °F (minimum)	D 93	120	130
Viscosity, centistokes	D 445	1.6-2.0	2.0-3.2

(4) Other petroleum distillate fuel specification requirements:
 (i) Other petroleum distillate fuels may be used for testing and service accumulation provided they are commercially available, and

(ii) Information, acceptable to the Administrator, is provided to show that only the designated fuel would be used in customer service, and
 (iii) Use of a fuel listed under paragraphs (b) (2) and (b) (3) of this section

would have a detrimental effect on emissions or durability, and

(iv) Written approval from the Administrator of the fuel specifications was provided prior to the start of testing.

(5) The specification range of the fuels to be used under paragraphs (b) (2), (b) (3), and (b) (4) of this section shall be reported in accordance with § 86.077-21 (b) (3).

§ 86.177-7 Gasoline-fueled vehicle and engine preparation.

(a) Gasoline-fueled vehicles to be tested for compliance with the exhaust and fuel evaporative emissions standards of this subpart shall be prepared as follows:

(1) (i) Apply appropriate leak proof fittings to all fuel system external vents to permit collection of effluent vapors from these vents during the course of the prescribed tests. Since the prescribed test requires the temporary plugging of the inlet pipe to the air cleaner, it will be necessary to install a probe for collecting the normal effluents from this source. Where antisurge/vent filler caps are employed on the fuel tank, plug off the normal vent if it does not conveniently lend itself to the collection of vapors which emanate from it, and introduce a separate vent, with appropriate fitting on the cap. Where the fuel tank vent line terminus is inaccessible, sever the line at a convenient point near the fuel tank and install the collection system in a closed circuit assembly with the severed ends. All fittings shall terminate in 5/8-inch ID tube sections for ready connection to the collection systems and shall be designed for minimum dead space.

(ii) The design and installation of the necessary fittings shall not disturb the normal function of the fuel system components or the normal pressure relationships in the system.

(2) (i) Inspect the fuel system carefully to insure the absence of any leaks to the atmosphere of either liquid or vapor which might affect the accuracy of the test or the performance of the control system. Corrective action, if required, shall be performed in accordance with § 86.077-25 and be reported with the test results under § 86.077-23.

(ii) Care should be exercised in the application of any pressure tests, neither to purge nor load the evaporative emission control system.

(3) Prepare fuel tank for recording the temperature of the prescribed test fuel at its approximate midvolume.

(4) Provide additional fittings and adapters as required, to accommodate a fuel drain at the lowest point possible in the tank as installed on the vehicle.

(b) Gasoline-fueled vehicles to be tested for compliance only with the exhaust emission standards of this subpart shall be prepared as follows:

(1) (i) Inspect the fuel system carefully to insure the absence of any leaks to the atmosphere of either liquid or vapor which might affect the accuracy of the test or the performance of the control system. Such inspection shall include the application of a pressure of 14.5 inches

of water (plus or minus 0.5 inches of water) to the fuel system. The pressure should be applied and allowed to stabilize and the fuel system isolated from the pressure source. The fuel system may not lose more than 2.0 inches of water for five minutes beginning with the isolation of the fuel system. Corrective action, if required, shall be performed in accordance with § 86.077-25 and be reported with the test results under § 86.077-23.

(1) Care should be exercised, in the application of any pressure tests, neither to purge nor load the evaporative emission control system.

§ 86.177-8 Vehicle preconditioning.

(a) Gasoline-fueled vehicles to be tested for compliance with the exhaust and fuel evaporative emissions standard of this part shall be preconditioned as follows:

(1) The test vehicle shall be operated under the conditions prescribed for mileage accumulation, § 86.077-26, for one hour immediately prior to the operation prescribed below.

(2) The fuel tank shall be drained and specified test fuel (§ 86.177-6(a)) added. The evaporative emission control system or device shall not be abnormally purged or loaded as a result of draining or fueling the tank.

(3) The test vehicle shall be placed on the dynamometer and operated over a simulated trip, according to the applicable requirements and procedures of §§ 86.177-10 through 86.177-15 except that the engine need not be cold when starting the run on the dynamometer and only a single trip of 7.5 miles shall be run. The test vehicle may be used to set dynamometer horsepower, if necessary. During this operation the ambient temperature shall be between 68° F and 86° F.

(4) The engine and cooling fan shall be stopped upon completion of the dynamometer operation and the vehicle permitted to soak either on or off the dynamometer stand at an ambient temperature between 68° F and 86° F for a period of not less than one hour prior to the soak period prescribed in § 86.177-9(a) (1).

(b) Gasoline-fueled vehicles to be tested for compliance only with the exhaust emissions standards of this part shall be preconditioned as follows:

(1) The fuel tank(s) shall be drained and filled with the specified test fuel (§ 86.177-6(a)) to the prescribed tank(s) fuel volume, defined in § 86.077-2. The fuel added to the vehicle tank(s) shall have an initial temperature of no more than 86° F. The evaporative emission control system or device shall not be abnormally purged or loaded as a result of draining or fueling the tank(s).

(2) The test vehicle shall be placed on the dynamometer and operated over a simulated trip, according to the applicable requirements and procedures of §§ 86.177-10 through 86.177-15 except that the engine need not be cold when starting the run on the dynamometer and only a single trip of 7.5 miles shall be run. Longer preconditioning may be permitted with advance approval of the Ad-

ministrator. The test vehicle may be used to set dynamometer horsepower, if necessary. During this operation the ambient temperature shall be between 68° F and 86° F.

(3) The engine and cooling fan shall be stopped upon completion of the dynamometer operation and the vehicle permitted to soak either on or off the dynamometer stand at an ambient temperature between 68° F and 86° F for a period of not less than one hour.

(4) The test vehicle shall be allowed to soak in an area where the ambient temperature is maintained between 60° F and 86° F for a period of not less than 11 (eleven) hours prior to the dynamometer operation prescribed in §§ 86.177-10 through 86.177-20.

(5) The vehicle shall be operated on the dynamometer according to the requirements and procedures of § 86.177-20. This operation completes the test.

(c) Diesel vehicles to be tested for compliance with the exhaust emission standards of this part shall be preconditioned as follows:

(1) The fuel tank of the test vehicle shall be drained and charged with the specified test fuel, § 86.177-6(b) (2) to the prescribed "tank fuel volume," defined in § 86.077-2. The vehicle manufacturer shall provide additional fittings and adapters, as required to accommodate a fuel drain at the lowest point possible in the tank as installed on the vehicle. Test fuel, when charged to the tank shall be at ambient temperature, § 86.177-5 (b) (2) (1).

(2) The test vehicle shall be placed on the dynamometer and operated over a simulated trip, according to the applicable requirements and procedures of §§ 86.177-10 through 86.177-15 except that the engine need not be cold when starting the run on the dynamometer and only a single trip of 7.5 miles shall be run. The test vehicle may be used to set dynamometer horsepower, if necessary.

(3) The engine and cooling fan shall be stopped upon completion of the dynamometer operation and the vehicle permitted to soak either on or off the dynamometer stand for a period of not less than 12 hours prior to the dynamometer test.

§ 86.177-9 Evaporative emission collection procedure for gasoline-fueled vehicles.

The standard test procedure consists of three parts described below which shall be performed in sequence and without any interruption in the test conditions prescribed.

(a) Diurnal breathing loss test. (1) The test vehicle shall be allowed to soak in an area where the ambient temperature is maintained between 60° F and 86° F, for a period of not less than 10 hours. (The vehicle preparation requirements of § 86.177-7 may be performed during this period.) It shall then be transferred to a soak area where the ambient temperature is maintained between 68° F and 86° F. Upon admittance to the 68° F-86° F soak area, the prescribed fuel tank thermocouple shall be

connected to the recorder and the fuel and ambient temperature recorded at a chart speed of approximately 12 inches per hour (or equivalent record).

(2) The fuel tank of the prepared test vehicle, preconditioned according to § 86.177-8, shall be drained and recharged with the specified test fuel, § 86.177-6, to the prescribed "tank fuel volume," defined in § 86.077-2. The temperature of the fuel following the charge to the tank shall be 60° F ± 2° F. Care should be exercised against abnormal loading of the evaporative-emission control system or device as a result of fueling the tank.

(3) Immediately following the fuel charge to the tank, the exhaust pipe(s) and inlet pipe to the air cleaner shall be plugged and the prescribed vapor collection systems installed on all fuel system external vents. Multiple vents may be connected to a single collection trap provided that, where there is more than one external vent on a fuel system distinguishing between carburetor and tank vapors, separate collection systems shall be employed to trap the vapors from the separate sources. Every precaution shall be taken to minimize the lengths of the collection tubing employed and to avoid sharp bends across the entire system.

(4) Artificial means shall be employed to heat the fuel in the tank to 84° F ± 2° F. The prescribed temperature of the fuel shall be achieved over a period of 60 minutes ± 10 minutes at a constant rate of change of temperature with respect to time. After a minimum of 1 hour following admittance to the 68° F-86° F soak area, the vehicle shall be moved onto the dynamometer stand for the subsequent part of the test. The fuel tank thermocouple may be temporarily disconnected to permit moving the test vehicle. Plugs shall be removed from the exhaust pipe(s) and inlet pipe to the air cleaner.

(b) Running loss test. (1) The vehicle shall be placed on the dynamometer.

(2) Where an external vent is located such that any running loss emissions would be inducted into the engine, the vapor loss measurement system shall be temporarily disconnected from that vent and clamped. Vapor losses from this vent need not be measured during this part of the test.

(3) The vehicle shall be operated on the dynamometer according to the requirements and procedures of §§ 86.177-10 through 86.177-20. The engine and fan shall be turned off upon completion of the dynamometer run and the exhaust and air cleaner inlet pipes shall be replugged.

(4) Vapor losses need not be measured during the 10-minute soak or 505-second hot start test. Any vapor loss collection system used during the cold start shall be temporarily disconnected and clamped. At the end of the hot start test, the vapor collection systems shall be reconnected for the following phase.

(c) Hot soak test. Upon completion of the dynamometer run, the test vehicle shall be permitted to soak with hood down for a period of one hour at an ambient temperature between 68° F and 86° F. This operation completes the test. The

traps are disconnected and weighed according to § 86.177-17.

(d) Alternate to paragraph (a) of this section: Diurnal breathing loss test. (1) The test vehicle shall be allowed to soak in an area where the ambient temperature is maintained between 60°F and 86°F for a period of not less than 10 hours. (The vehicle preparation requirements of § 86.177-7 may be performed during this period.) It shall then be transferred to a soak area where the ambient temperature is maintained between 68°F and 86°F.

(2) The fuel tank of the prepared test vehicle, preconditioned according to § 86.177-8, shall be drained and recharged with the specified test fuel, § 86.177-6, to the prescribed "tank fuel volume," defined in § 86.077-2. The temperature of the fuel prior to delivery to the fuel tank shall be between 50°F and 60°F. Care should be exercised against abnormal loading of the evaporative-emission control system or device as a result of fueling the tank.

(3) Connect the prescribed fuel tank thermocouple to the recorder and record the fuel and ambient temperatures at a chart speed of approximately 12 inches per hour (or equivalent record). Plug the exhaust pipe(s) and inlet pipe to the air cleaner and when the fuel temperature reaches 60°F±2°F install the prescribed vapor collection systems on all fuel system external vents. Multiple vents may be connected to a single collection trap provided that, where there is more than one external vent on a fuel system distinguishing between carburetor and tank vapors, separate collection systems shall be employed to trap the vapors from the separate sources. Every precaution shall be taken to minimize the lengths of the collection tubing employed and to avoid sharp bends across the entire system.

(4) Artificial means shall be employed to heat the fuel in the tank to 84°F±2°F. The prescribed temperature of the fuel shall be achieved over a period of 60 minutes ±10 minutes at a constant rate of change of temperature with respect to time. After a minimum of one hour following admittance to the 68°F-86°F soak area, the vehicle shall be moved onto the dynamometer stand for the subsequent part of the test. The fuel tank thermocouple may be temporarily disconnected to permit moving the test vehicle. Plugs shall be removed from the exhaust pipe(s) and inlet pipe to the air cleaner.

§ 86.177-10 Dynamometer driving schedule.

(a) The dynamometer driving schedule to be followed consists of a non-repetitive series of idle, acceleration, cruise, and deceleration modes of various time sequences and rates. The driving schedule is defined by a smooth transition through the speed vs. time relationships listed in Appendix I. The time sequence begins upon starting the vehicle according to the startup procedure described in § 86.177-15.

(b) The speed tolerance at any given time on the dynamometer driving schedule prescribed in Appendix I or as

printed on a driver's aid chart approved by the Administrator, when conducted to meet the requirements of § 86.177-11, is defined by upper and lower limits. The upper limit is 2 m.p.h. higher than the highest point on the trace within 1 second of the given time. The lower limit is 2 m.p.h. lower than the lowest point on the trace within 1 second of the given time. Speed variations greater than the tolerances (such as occur when shifting manual transmission vehicles) are acceptable provided they occur for less than 2 seconds on any one occasion. Speeds lower than those prescribed are acceptable provided the vehicle is operated at maximum available power during such occurrences. Further, speed deviations from those prescribed due to stalling are acceptable provided the provisions of § 86.177-15(d) are adhered to. When conducted to meet the requirements of § 86.177-8, the speed tolerance shall be as specified above, except that the upper and lower limits shall be 4 m.p.h.

§ 86.177-11 Dynamometer procedure.

(a) The dynamometer run consists of two tests, a "cold" start test after a minimum 12-hour soak (according to the provisions of §§ 86.177-8, and 86.177-9 for gasoline-fueled vehicles) and a "hot" start test with a 10-minute soak between the two tests. Engine startup (with all accessories turned off), operation over the driving schedule, and engine shutdown make a complete cold start test. Engine startup and operation over the first 505 seconds of the driving schedule complete the hot start test. The exhaust emissions are diluted with air to a constant volume and a portion is sampled continuously during each test. (Diesel hydrocarbons are analyzed continuously.) The composite (flow integrated) samples collected in bags are analyzed for hydrocarbons, (except Diesel), carbon monoxide, carbon dioxide, and oxides of nitrogen. A parallel sample of the dilution air is similarly analyzed for hydrocarbon, carbon monoxide, and oxides of nitrogen.

(b) During the dynamometer operation, a fixed speed cooling fan shall be positioned so as to direct cooling air to the vehicle in an appropriate manner with the engine compartment cover open. The fan capacity shall normally not exceed 5,300 c.f.m. If, however, the manufacturer can show that during field operation the vehicle receives additional cooling, the fan capacity may be increased or additional fans used if approved in advance by the Administrator.

In the case of vehicles with front engine compartments, the fan(s) shall be squarely positioned between 8 and 12 inches in front of the cooling air inlets (grill). In the case of vehicles with rear engine compartments (or if special designs make the above impractical, the cooling fan(s) shall be placed in a position to provide sufficient air to maintain engine cooling.

(c) The vehicle shall be nearly level when tested in order to prevent abnormal fuel distribution.

(d) Flywheels, electrical, or other means of stimulating inertia as shown in the following table shall be used. If the equivalent inertia specified is not available on the dynamometer being used, the next higher equivalent inertia (not to exceed 250 lbs.) available shall be used.

Loaded vehicle weight (pounds)	Equivalent inertia weight (pounds)	Road load power at 50 m.p.h. (horsepower)
Up to 1,125	1,000	5.9
1,125 to 1,375	1,250	6.5
1,375 to 1,625	1,500	7.1
1,625 to 1,875	1,750	7.7
1,875 to 2,125	2,000	8.3
2,125 to 2,375	2,250	8.8
2,375 to 2,625	2,500	9.4
2,625 to 2,875	2,750	9.9
2,875 to 3,250	3,000	10.3
3,251 to 3,750	3,500	11.2
3,751 to 4,250	4,000	12.0
4,251 to 4,750	4,500	12.7
4,751 to 5,250	5,000	13.4
5,251 to 5,750	5,500	13.9
5,751 to above	5,500	14.4

(e) Power absorption unit adjustment.

(1) The power absorption unit shall be adjusted to reproduce road load power at 50 m.p.h. true speed. The indicated road load power setting shall take into account the dynamometer friction. The relationship between road load (absorbed) power and indicated road load power for a particular dynamometer shall be determined by the procedure outlined in Appendix II or other suitable means.

(2) The road load power listed above shall be used or the vehicle manufacturer may determine the road load power by an alternate procedure requested by the manufacturer and approved in advance by the Administrator, or the vehicle manufacturer may determine the road load power by the following procedure and request its use:

(i) Gasoline-fueled vehicles.
 (A) Measuring the absolute manifold pressure of a representative vehicle, of the same equivalent inertia weight class, when operated on a level road under balanced wind conditions at a true speed of 50 m.p.h., and

(B) Noting the dynamometer indicated road load horsepower setting required to reproduce that manifold pressure when the same vehicle is operated on the dynamometer at a true speed of 50 m.p.h. The tests on the road and on the dynamometer shall be performed with the same vehicle ambient absolute pressure (usually barometric), i.e., within ±5 mm. Hg.

(C) The road load power shall be determined according to the procedure outlined in Appendix II and adjusted according to the following if applicable.

(ii) Diesel vehicles.
 (A) Measuring the fuel flow rate of a representative vehicle of the same equivalent inertia weight class, when operated on a level road under balanced wind conditions at a true speed of 50 m.p.h., and

(B) Noting the dynamometer indicated road load horsepower setting required to reproduce that fuel flow rate when the same vehicle is operated on the dynamometer at a true speed of 50

m.p.h. The tests on the road and on the dynamometer shall be performed with the same vehicle ambient absolute pressure (usually barometric), i.e., within ± 5 mm. Hg.

(C) The road load power shall be determined according to the procedure outlined in Appendix II and adjusted according to the following if applicable.

(3) Where it is expected that more than 33 percent of the vehicles in an engine family will be equipped with air conditioning, the road load power listed above or as determined in paragraph (e) (2) of this section shall be increased by 10 percent for testing all test vehicles representing such engine family if those vehicles are intended to be offered with air conditioning in production.

(f) The vehicle speed (m.p.h.) as measured from the dynamometer rolls shall be used for all conditions. A speed vs. time recording, as evidence of dynamometer test validity, shall be supplied on request of the Administrator.

(g) Practice runs over the prescribed driving schedule may be performed at test points, provided an emission sample is not taken, for the purpose of finding the minimum accelerator pedal action to maintain the proper speed-time relationship, or to permit sampling system adjustments to comply with § 86.177-16 (a) (2) (ii) or § 86.177-16(b) (2) (ii).

NOTE: When using two-roll dynamometers a truer speed-time trace may be obtained by minimizing the rocking of the vehicle in the rolls. The rocking of the vehicle changes the tire rolling radius on each roll. The rocking may be minimized by restraining the vehicle horizontally (or nearly so) by using a cable and winch.

(h) The drive wheel tires may be inflated up to 45 p.s.i.g. in order to prevent tire damage. The drive wheel tire pressure shall be reported with the test results.

(i) If the dynamometer has not been operated during the 2-hour period immediately preceding the test it shall be warmed up for 15 minutes by operating it at 30 m.p.h. using a nontest vehicle.

(j) If the dynamometer horsepower must be adjusted manually, it shall be set within one hour prior to the exhaust emissions test phase. The test vehicle shall not be used to make this adjustment. Dynamometers using automatic control of preselectable power settings may be set anytime prior to the beginning of the emissions test.

§ 86.177-12 Manual transmissions.

(a) All test conditions except as noted shall be run according to the manufacturer's recommendation to the ultimate purchaser.

(b) Vehicles equipped with free wheeling or overdrive shall be tested with these features operated according to the manufacturer's recommendations to the ultimate purchaser.

(c) Idle shall be run with transmission in gear and with clutch disengaged (except first idle; see § 86.177-15).

(d) The vehicle shall be driven with minimum accelerator pedal movement to maintain the desired speed.

(e) Acceleration modes shall be driven smoothly following the shift speeds and procedure as recommended by the manufacturer to the ultimate purchaser. The operator shall release the accelerator pedal during the shift, and accomplish the shift with minimum closed throttle time. If the vehicle cannot accelerate at the specified rates, the vehicle shall be operated with the accelerator pedal fully depressed until the vehicle speed reaches the speed at which it should be at that point during the test.

(f) The deceleration modes shall be run with clutch engaged and without shifting gears from the previous mode, using brakes or accelerator pedal as necessary to maintain the desired speed. For those modes which decelerate to zero, the clutch shall be depressed when the speed drops below 15 m.p.h., when engine roughness is evident, or when engine stalling is imminent.

(g) Downshifting is allowed at the beginning of or during a power mode in accordance with the manufacturer's recommendation to the ultimate purchaser.

(h) If the transmission ratio in first gear exceeds 5:1, follow the procedure as recommended by the manufacturer to the ultimate purchaser for the use of first gear.

§ 86.177-13 [Reserved]

§ 86.177-14 Automatic transmissions.

(a) All test conditions shall be run according to the manufacturer's recommendation to the ultimate purchaser.

(b) Idle modes shall be run with the transmission in "Drive" and the wheels braked (except first idle; see § 86.177-15).

(c) The vehicle shall be driven with minimum accelerator pedal movement to maintain the desired speed.

(d) Acceleration modes shall be driven smoothly allowing the transmission to shift in accordance with the manufacturer's recommendations to the ultimate purchaser. If the vehicle cannot accelerate at the specified rates, the vehicle shall be operated with the accelerator pedal fully depressed until the vehicle speed reaches the speed at which it should be at that point during the driving schedule.

(e) The deceleration modes shall be run in gear using brakes or accelerator pedal as necessary to maintain the desired speed.

(f) Vehicles equipped with free wheeling or overdrive shall be tested with these features operated according to the manufacturer's recommendation to the ultimate purchaser.

§ 86.177-15 Engine starting and re-starting.

(a) *Gasoline-fueled vehicles.* Paragraph (a) of this section applies to gasoline-fueled vehicles.

(1) The engines shall be started according to the manufacturer's recommended starting procedures. The initial 20-second idle period shall begin when the engine starts.

(2) *Choke operation.* (i) Vehicles equipped with automatic chokes shall be operated according to the instructions which will be included in the manufacturer's operating instructions or owner's manual including choke setting and "kick-down" from cold fast idle. The transmission shall be placed in gear 15 seconds after the engine is started. If necessary, braking may be employed to keep the drive wheels from turning.

(ii) Vehicles equipped with manual chokes shall be operated according to the manufacturer's instructions to the ultimate purchaser in the owner's manual. The transmission shall be placed in gear 15 seconds after the engine is started. If necessary, braking may be employed to keep the drive wheels from turning.

(3) The operator may use the choke, accelerator pedal, etc. where necessary to keep the engine running.

(4) If the manufacturer's operating or owner's manual does not specify a warm engine starting procedure, the engine (automatic and manual choke engines) shall be started by depressing the accelerator pedal about half way and cranking the engine until it starts.

(b) *Diesel vehicles.* Paragraph (b) of this section applies to Diesel vehicles.

(1) The engine shall be started according to the manufacturer's recommended starting procedures. The initial 20-second idle period shall begin when the engine starts. The transmission shall be placed in gear 15 seconds after the engine is started. If necessary, braking may be employed to keep the drive wheels from turning.

(c) If the vehicle does not start after 10 seconds of cranking, cranking shall cease and the reason for failure to start shall be determined. The revolution counter on the constant volume sampler (and the hydrocarbon integrator when testing Diesel vehicles, see § 86.177-20) shall be turned off and the sample solenoid valves placed in the "dump" position during this diagnostic period. In addition, either the positive displacement pump should be turned off or the exhaust tube disconnected from the tailpipe during the diagnostic period. If failure to start is an operational error, the vehicle shall be rescheduled for testing from a cold start. If failure to start is caused by vehicle malfunction, corrective action of less than 30 minutes duration may be taken and the test continued. The sampling system shall be reactivated at the same time cranking is started. When the engine starts, the driving schedule timing sequence shall begin. If failure to start is caused by vehicle malfunction and the vehicle cannot be started, the test shall be voided, the vehicle removed from the dynamometer, corrective action taken, and the vehicle rescheduled for test. The reason for the malfunction (if determined) and the corrective action taken shall be reported.

(d) If the engine "false starts," the operator shall repeat the recommended starting procedure (such as resetting the choke, etc.)

(e) *Stalling.* (1) If the engine stalls during an idle period, the engine shall be

restarted immediately and the test continued. If the engine cannot be started soon enough to allow the vehicle to follow the next acceleration as prescribed, the driving schedule indicator shall be stopped. When the vehicle restarts, the driving schedule indicator shall be reactivated.

(2) If the engine stalls during some operating mode other than idle, the driving schedule indicator shall be stopped, the vehicle restarted, accelerated to the speed required at that point in the driving schedule and the test continued.

(3) If the vehicle will not restart within one minute, the test shall be voided, the vehicle removed from the dynamometer, corrective action taken, and the vehicle rescheduled for test. The reason for the malfunction (if determined), and the corrective action taken shall be reported.

§ 86.177-16 Sampling and analytical system (exhaust emissions).

(a) Gasoline-fueled vehicles. The sampling and analytical systems for gasoline-fueled vehicles shall comply with paragraph (a) of this section:

(1) Schematic drawings. The following figures (Figs. B77-1 and B77-2) are schematic drawings of the exhaust gas sampling and analytical systems which will be used for testing under the regulations in this part. Since various configurations of the required components can produce accurate results, these schematic drawings are not to be interpreted literally and exact conformance is not mandatory. Additional components such as instruments, valves, solenoids, pumps, and switches may be used to provide additional information and coordinate the functions of the component systems.

(2) Component description (exhaust gas sampling system). The following components will be used in the exhaust gas sampling systems for testing under the regulations in this subpart. See figure B77-1. Other types of constant volume samplers may be used if shown to yield equivalent results and if approved in advance by the Administrator.

(i) A dilution air filter assembly consisting of a particulate (paper) filter to remove solid matter from the dilution air and thus increase the life of the charcoal filter; a charcoal filter to reduce and stabilize the background hydrocarbon level; and a second particulate filter to remove charcoal particles from the air stream.

(ii) A leak-tight connector and tube to the vehicle tailpipe. The tubing shall be sized and connected in such a manner that the static pressure variations in the vehicle tailpipe(s) remain within ± 5 inches of water of the static pressure variations measured during a dynamometer driving cycle with no connection to the tailpipe(s). Sampling systems capable of tolerances of ± 1 inch of water will be used by the Administrator if a written request by the manufacturer substantiates the need for this closer tolerance.

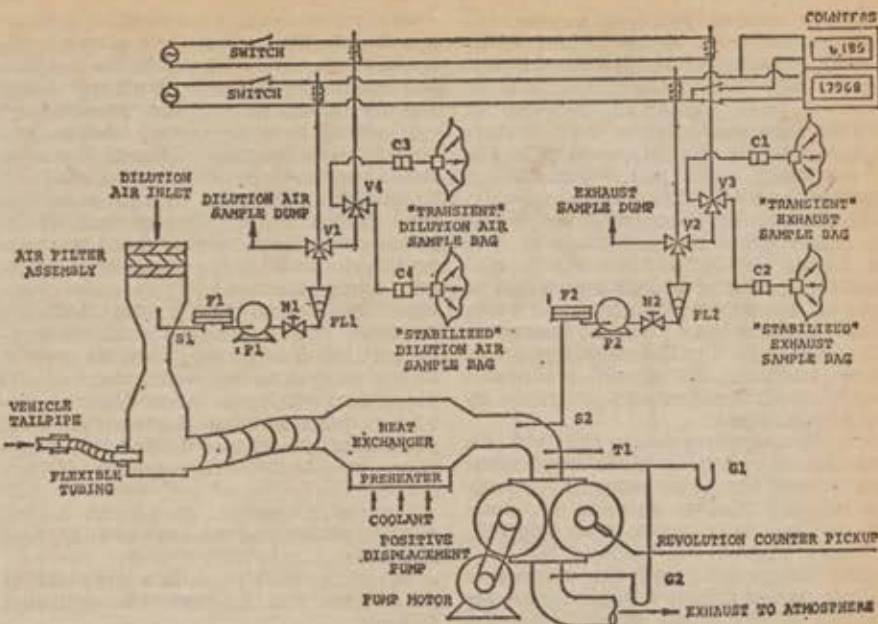


Figure B 77-1 - Exhaust Gas Sampling System

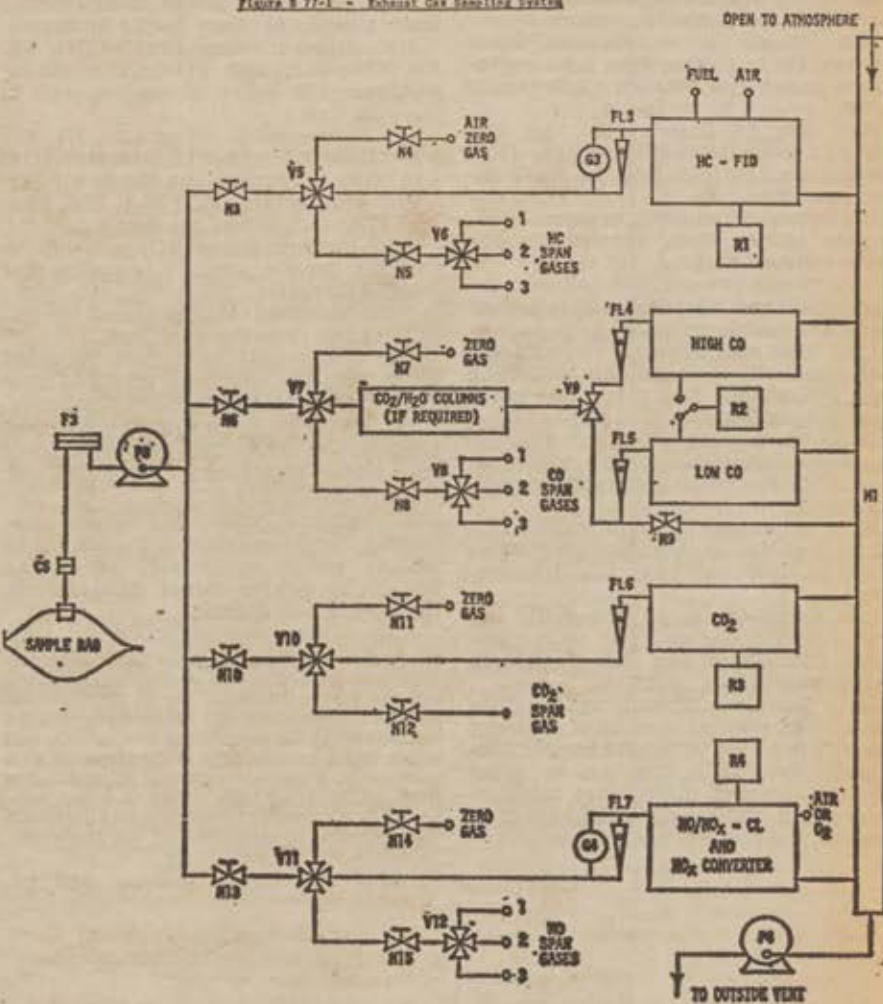


Figure B 77-2 Exhaust Gas Analytical System

(iii) A heating system to preheat the heat exchanger to within $\pm 10^\circ\text{F}$ of its operating temperature before the test begins.

(iv) A heat exchanger capable of limiting the gas mixture temperature variation during the entire test to $\pm 10^\circ\text{F}$ as measured at a point immediately ahead of the positive displacement pump.

(v) A positive displacement pump to pump the dilute exhaust mixture. The pump capacity (300 to 350 c.f.m. is sufficient for testing most vehicles) shall be large enough to virtually eliminate water condensation in the system. See Appendix III for one flow calibration technique. Other suitable calibration techniques may be used if approved in advance by the Administrator.

(vi) Temperature sensor (T1) with an accuracy of $\pm 2^\circ\text{F}$ to allow continuous recording of the temperature of the dilute exhaust mixture entering the positive displacement pump. (See § 86.177-18(1)).

(vii) Gauge (G1) with an accuracy of ± 3 mm. Hg to measure the pressure depression of the dilute exhaust mixture entering the positive displacement pump, relative to atmospheric pressure.

(viii) Gauge (G2) with an accuracy of ± 3 mm. Hg to measure the pressure increase across the positive displacement pump.

(ix) Sample probes (S1 and S2) pointed upstream to collect samples from the dilution airstream and the dilute exhaust mixture.

(x) Filters (F1 and F2) to remove particulate matter from dilution air and dilute exhaust samples.

(xi) Pumps (P1 and P2) to pump the dilution air and dilute exhaust into their respective sample collection bags.

(xii) Flow control valves (N1 and N2) to regulate flows to sample collection bags, at constant flow rates. The minimum sample flow rate shall be 10 c.f.h.

(xiii) Flowmeters (FL1 and FL2) to insure, by visual observation, that constant flow rates are maintained throughout the test.

(xiv) Three-way solenoid valves (V1, V2, V3, and V4) to direct sample streams to either their respective bags or overboard.

(xv) Quick-connect, leak-tight fittings (C1, C2, C3, and C4) with automatic shutoff on bag side to attach sample bags to sample system.

(xvi) Sample collection bags for dilution air and exhaust samples of sufficient capacity so as not to impede sample flow.

(xvii) Revolution counters to count the revolutions of the positive displacement pump while each test phase is in progress and samples are being collected.

(3) Component description (exhaust gas analytical system). The following components will be used in the exhaust gas analytical system for testing under the regulations in this part. The analytical system provides for the determination of hydrocarbon concentrations by flame ionization detector (FID) analysis, the determination of carbon monoxide and carbon dioxide concentrations by nondispersive infrared (NDIR) analysis and the determination of oxides of nitrogen concentrations by chemiluminescence (CL) analysis in dilute exhaust samples. The CL method of analysis requires that the nitrogen dioxide present in the sample be converted to nitric oxide before analysis. Other types of analyzers may be used if shown to yield equivalent results and if approved in advance by the Administrator. See Figure B77-2.

(i) Quick-connect leak-tight fitting (C5) to attach sample bags to analytical system.

(ii) Filter (F3) to remove any residual particulate matter from the collected sample.

(iii) Pump (P3) to transfer samples from the sample bags to the analyzers.

(iv) Selector valves (V5, V6, V7, V8, V9, V10, V11, and V12) for directing samples, span gases, or zeroing gases to the analyzers.

(v) Flow control valves (N3, N4, N5, N6, N7, N8, N9, N10, N11, N12, N13, N14, and N15) to regulate the gas flow rates.

(vi) Flowmeters (FL3, FL4, FL5, FL6, and FL7) to indicate gas flow rates.

(vii) Pressure gauges (G3 and G4) to facilitate greater precision in setting and reading flowrates.

(viii) Manifold (M1) to collect the expelled gases from the analyzers.

(ix) Pump (P4) to transfer expelled gases from the collection manifold to a vent external to the test room (optional).

(x) Analyzers to determine hydrocarbon, carbon monoxide, carbon dioxide, and oxides of nitrogen concentrations. See § 86.177-19(a).

(xi) Sample conditioning column containing CaSO_4 or indicating silica gel to remove water vapor and containing ascarite to remove carbon dioxide from the CO analysis stream.

NOTE: If CO instruments which are essentially free of CO_2 and water vapor interference are used, the use of the conditioning column may be deleted. See §§ 86.177-18(h) and 86.177-22(c). A CO instrument will be considered to be essentially free of CO_2 and water vapor interference if its response to a mixture of 3 percent CO_2 and N_2 , which has been bubbled through water at room temperature ($68^\circ\text{--}86^\circ\text{F}$), produces an equivalent CO response, as measured on the most sen-

sitive CO range, which is less than 1 percent of full scale CO concentration on instrument ranges above 300 ppm CO or less than 3 ppm on instrument ranges below 300 ppm CO.

(xii) Recorders (R1, R2, R3, and R4) or digital printers to provide permanent records of calibration, spanning, and sample measurements; or in those facilities where computerized data acquisition systems are incorporated, the computer facility printout may be used.

(b) Diesel vehicles. The sampling and analytical systems for exhaust emissions tests on Diesel light-duty vehicles and Diesel light-duty trucks shall comply with paragraph (b) of this section:

(1) Schematic drawings. The following figures B77-3, B77-4, and B77-5 are schematic drawings of the exhaust gas sampling and analytical systems which will be used for testing under the regulations in this part. Since various configurations of the required components can produce accurate results, these schematic drawings are not to be interpreted literally and exact conformance is not mandatory. Additional components such as instruments, valves, solenoids, pumps, and switches may be used to provide additional information and coordinate the functions of the component systems.

(2) Component description (exhaust gas sampling system). The following components will be used in the exhaust gas sampling system for testing under the regulations in this part. See Figure B77-3. Other types of constant volume samplers may be used if shown to yield equivalent results, and if approved in advance by the Administrator.

(i) A dilution air filter assembly consisting of a particulate (paper) filter to remove solid matter from the dilution air and thus increase the life of the charcoal filter; a charcoal filter to reduce and stabilize the background hydrocarbon level; and a second particulate filter to remove charcoal particles from the air stream.

(ii) A leak-tight connector and tube to the vehicle tailpipe. The tubing shall be sized and connected in such a manner that the static pressure variations in the vehicle tailpipe(s) remain within ± 5 inches of water of the static pressure variations measured during a dynamometer driving cycle with no connection to the tailpipe(s). Sampling systems capable of tolerances of ± 1 inch of water will be used by the Administrator if a written request by the manufacturer substantiates the need for this closer tolerance.

(iii) A heating system to preheat the heat exchanger to within $\pm 10^\circ\text{F}$ of its operating temperature before the test begins.

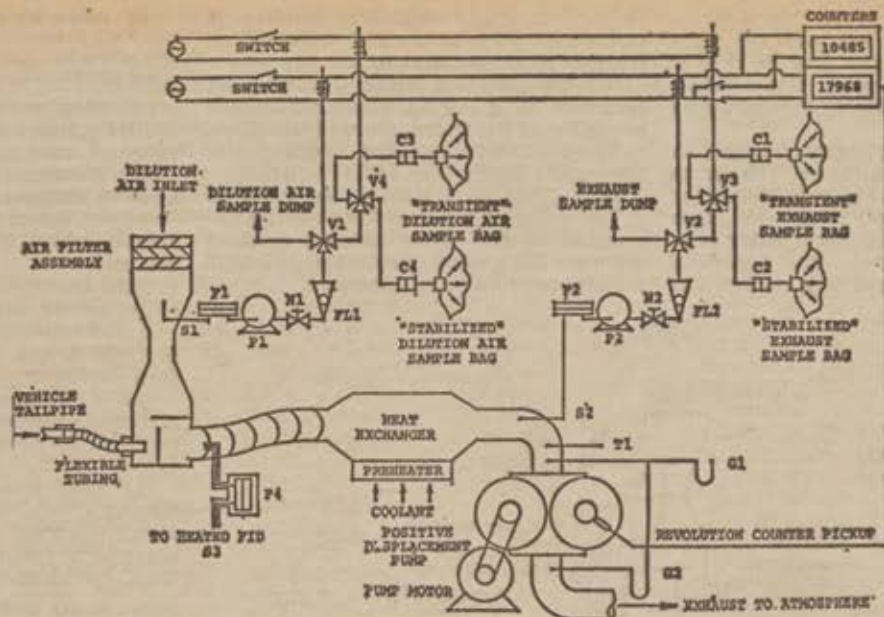


Figure B 77-3 Exhaust Gas Sampling System

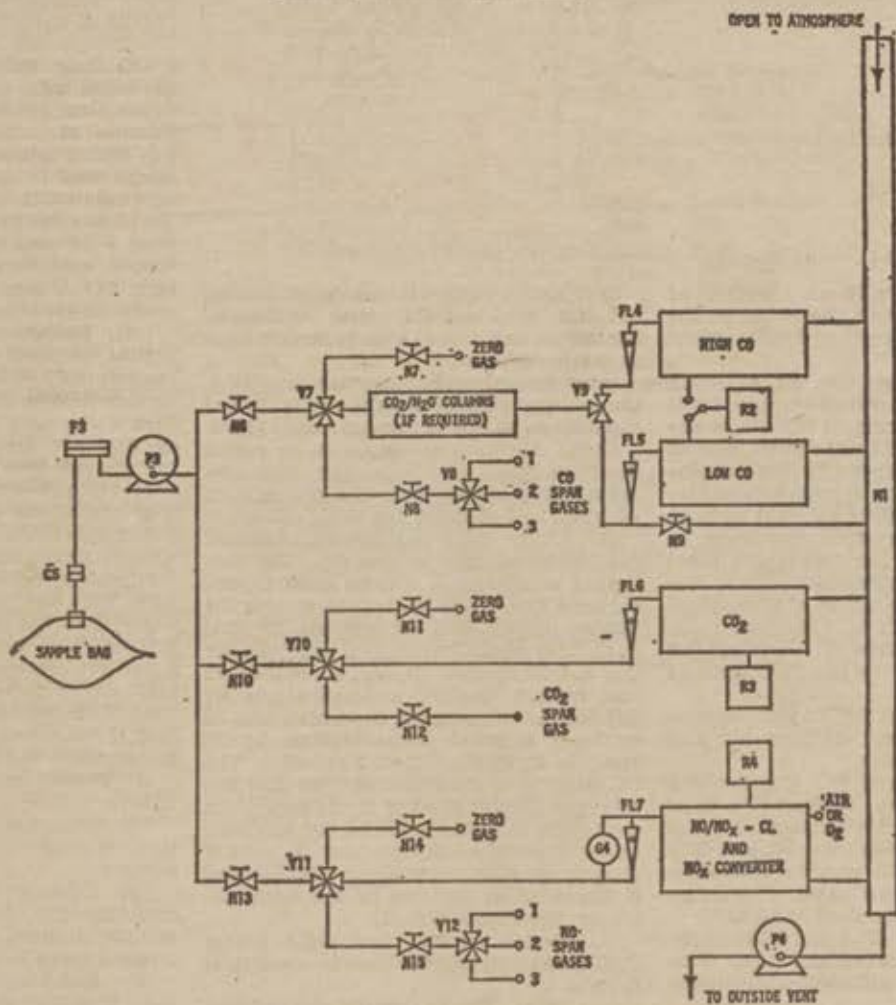


Figure B 77-4 Exhaust Gas Analytical System

(iv) A heat exchanger capable of limiting the gas mixture temperature variation during the entire test to $\pm 10^\circ\text{F}$ as measured at a point immediately ahead of the positive displacement pump.

(v) A positive displacement pump to pump dilute exhaust mixture. The pump capacity (300 to 350 c.f.m. is sufficient for testing most vehicles) shall be large enough to virtually eliminate water condensation in the system. See Appendix III to this part for one flow calibration

technique. Other suitable calibration techniques may be used if approved in advance by the Administrator.

(vi) Temperature sensor (T1) with an accuracy of $\pm 2^\circ\text{F}$ to allow continuous recording of the temperature of the dilute exhaust mixture entering positive displacement pump. (See § 86.177-18(1)).

(vii) Gage (G1) with an accuracy of ± 3 mm. Hg to measure the pressure depression of the dilute exhaust mixture entering the positive displacement pump, relative to atmospheric pressure.

(iv) Selector valves (V7, V8, V9, V10, V11, and V12) for directing samples, span gases or zeroing gases to the analyzers.

(v) Flow control valves (N6, N7, N8, N9, N10, N11, N12, N13, N14, and N15) to regulate the gas flow rates.

(vi) Flowmeters (FL4, FL5, FL6, and FL7) to indicate gas flow rates.

(vii) Pressure gauge (G4) to facilitate greater precision in setting and reading flow rate.

(viii) Manifold (M1) to collect the expelled gases from the analyzers.

(ix) Pump (P4) to transfer expelled gases from the collection manifold to a vent external to the testroom (optional).

(x) Analyzers to determine carbon monoxide, carbon dioxide and oxides of nitrogen concentrations (See § 86.177-19(a)).

(xi) Sample conditioning column containing CaSO_4 or indicating silica gel to remove water vapor and containing ascarite to remove carbon dioxide from the CO analyses stream.

NOTE: If CO instruments which are essentially free of CO₂ and water vapor interference are used, the use of the conditioning column may be deleted. See §§ 86.177-18(n) and 86.177-22(c).

A CO instrument will be considered to be essentially free of CO₂ and water vapor interference if its response to a mixture of 3 percent CO₂ in N₂ which has been bubbled through water at room temperature (68°-86°F), produces an equivalent CO response, as measured on the most sensitive CO range, which is less than 1 percent of full scale CO concentration on instrument ranges above 300 ppm CO or less than 3 ppm on instrument ranges below 300 ppm CO.

(xii) Recorders (R1, R2, and R3) or digital printers to provide permanent records of calibration, spanning and sample measurements; or in those facilities where computerized data acquisition systems are incorporated, the computer facility printout may be used.

(4) Component description (exhaust gas continuous analytical system). The following components will be used in the exhaust gas continuous analytical system for testing under the regulations in this part. This analytical system provides for the continuous determination of exhaust hydrocarbon concentration by heated flame ionization detector (HFID) analysis. Other types of analyzers may be used if shown to yield equivalent results and if approved in advance by the Administrator. See Figure B77-5.

(i) Heated continuous sampling line (S3).

(ii) Heated filter (F4) to remove particulate matter from heated hydrocarbon sample.

(iii) Selector valves (V5 and V6) for directing the continuous dilute exhaust sample, dilution air bag sample, span, or zeroing gases to the analyzers.

(iv) Quick-connect, leak-tight fitting (C6) to attach dilution air sample bag to analytical system.

(v) Heated hydrocarbon analyzer (HFID) complete with heated pump, filter, and flow control system. The re-

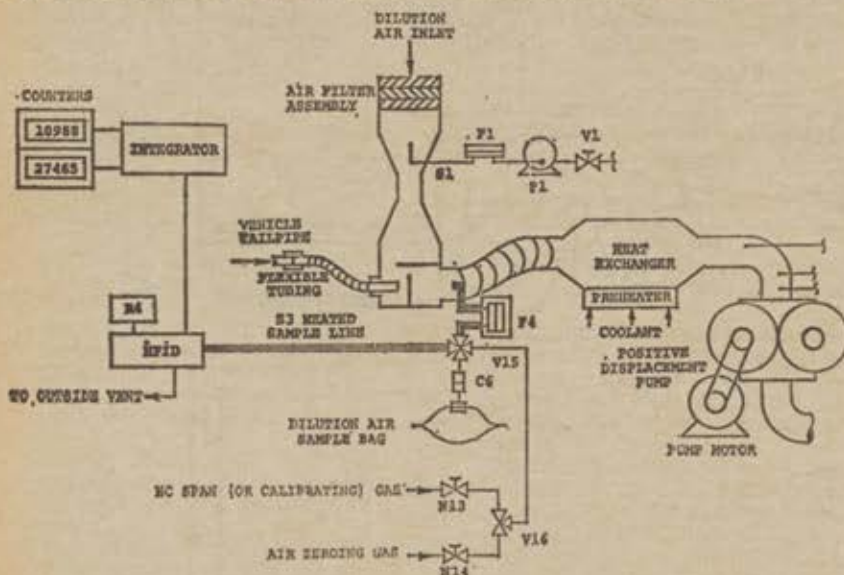


Figure B77-5 Diesel Hydrocarbon Continuous Analysis System

(viii) Gage (G2) with an accuracy of ± 3 mm. Hg to measure the pressure increase across the positive displacement pump.

(ix) Sample probes (S1, S2, and S3) pointed upstream to collect samples from the dilution air stream and the dilute exhaust mixture. Additional sample probes may be used, if approved by the Administrator, to obtain continuous concentration traces of the dilute exhaust stream. In such case the sample flow rate, in standard cubic feet per test phase, must be added to the calculated dilute exhaust volume. The position of the sample probes in Figure B77-3 is pictorial only. The heated sample line (S3) between the sampling point and the analyzer shall be as short as possible.

(x) Filters (F1 and F2) to remove particulate matter from dilution air and dilute exhaust samples.

(xi) Pumps (P1 and P2) to pump the dilution air and dilute exhaust into their respective sample collection bags.

(xii) Flow control valves (N1 and N2) to regulate flows to sample collection bags, at constant flow rates. The minimum sample flow rate shall be 10 c.f.h.

(xiii) Flowmeters (FL1 and FL2) to insure, by visual observation, that constant flow rates are maintained throughout the test.

(xiv) Three-way solenoid valves (V1, V2, V3, and V4) to direct sample streams to either their respective bags or overboard.

(xv) Quick-connect, leak-tight fittings (C1, C2, C3, and C4) with automatic shutoff on bag side to attach sample bags to sample system.

(xvi) Sample collection bags for dilution air and exhaust samples of sufficient capacity so as not to impede sample flow.

(xvii) Revolution counters to count the revolutions of the positive displacement pump while each test phase is in progress and samples are being collected.

(3) Component description (exhaust gas batch analytical system). The following components will be used in the exhaust gas batch analytical system for testing under the regulations in this part. The analytical system provides for the determination of carbon monoxide and carbon dioxide concentrations by NDIR analysis and the determination of oxides of nitrogen concentrations by CL analysis in dilute exhaust samples. The CL method of analysis requires that the nitrogen dioxide present in the sample be converted to nitric oxide before analysis. Other type of analyzers may be used if shown to yield equivalent results and if approved in advance by the Administrator. See Figure B77-4.

(i) Quick-connect, leak-tight fitting (C5) to attach sample bags to analytical system.

(ii) Filter (F3) to remove any residual particulate matter from the collected sample.

(iii) Pump (P3) to transfer samples from the sample bags to the analyzers.

response time of this instrument shall be less than 1 second for 90 percent of full-scale response. Sample transport time from sampling point to inlet of instrument shall be less than 4 seconds.

(vi) Chart recorder (R1) and analog integrator with two readouts, or chart recorder (R1) and on-line digital computer for manual or electronic integration of analyzer output signal during the three operating phases of the test.

(vii) Flow control valves (N4 and N5) to regulate the gas flow rates.

§ 86.177-17 Sampling and analytical system (fuel evaporative emissions, gasoline-fueled vehicles).

(a) Schematic drawing. (1) The following figures (Figures B77-6, B77-7, B77-8) are flow diagrams of typical evaporative loss collection applications. (2) Figure B77-6 represents an ar-

range ment for collecting losses which emanate from the carburetor. Figure B77-7 depicts the means for separately collecting the vapors which emanate from the fuel tank vent line and filler cap. Figure B77-8 shows an arrangement for collecting the losses from a closed fuel system, vented to the atmosphere solely through the air cleaner, as might be the case with certain fuel evaporative emission control devices.

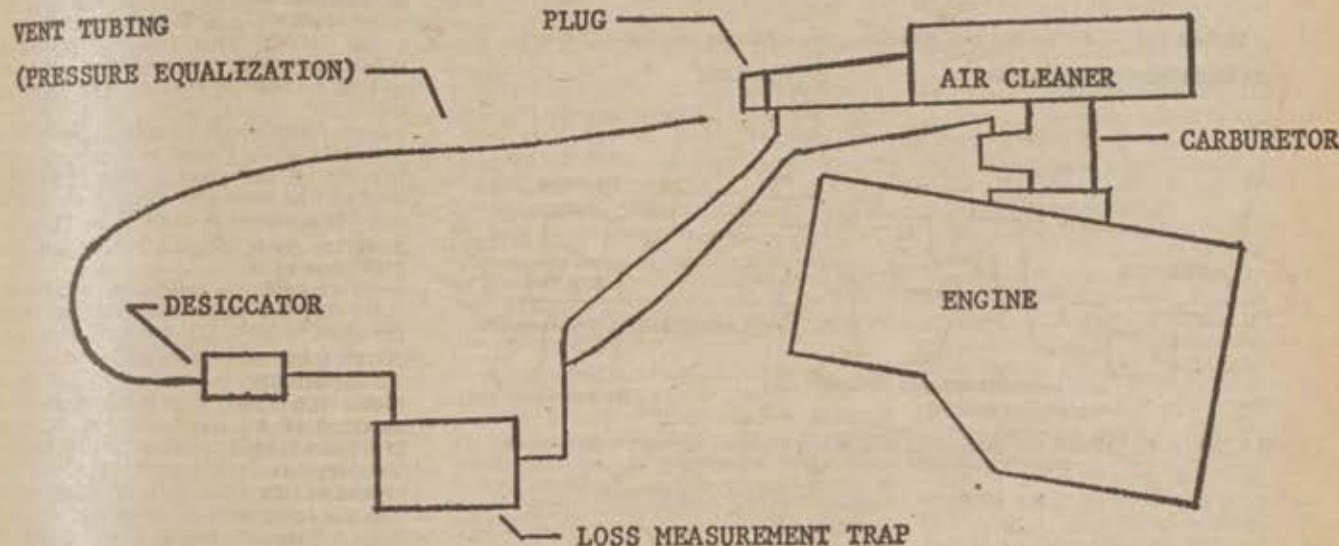


FIGURE B 77-6—Typical carburetor evaporative loss collection arrangement (schematic).

(3) Schematic drawings of arrangements to be employed shall be submitted in accordance with § 86.077-21(b)(3).

(b) Collection equipment. The following equipment shall be used for this collection of fuel evaporative emissions. (Item quantities are determined by individual test needs.)

(1) Activated carbon trap. See Figure B77-9 for specifications of one design; other configurations may be used; Provided, That they give demonstrably equivalent results.

(i) Canister—300±25 ml., cylindrical container having a length to diameter ratio of 1.4±0.1. An inlet tube, 5/16-inch

ID and 1 inch long is sealed into the top of the canister, at its geometric center. A similar outlet tube is sealed into the wall 1/4 inch from the bottom of the canister. The canister is designed to withstand an air pressure of 2 p.s.i., when sealed, without evidence of leaking when immersed in water for 30 seconds.

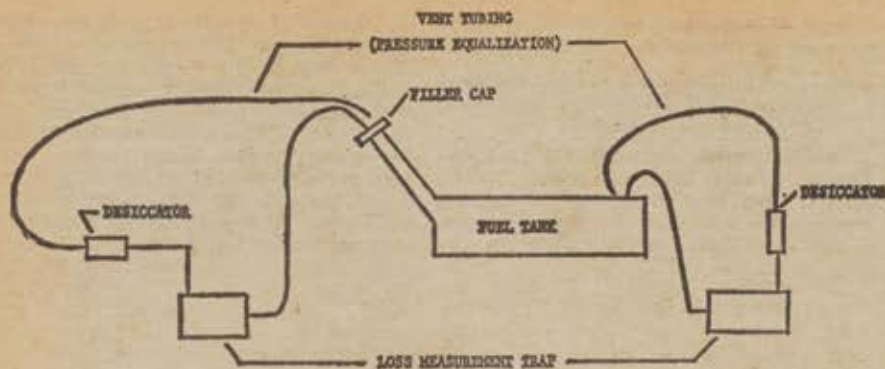


FIGURE B 77-7 - Typical fuel tank evaporative loss collection arrangement (schematic).

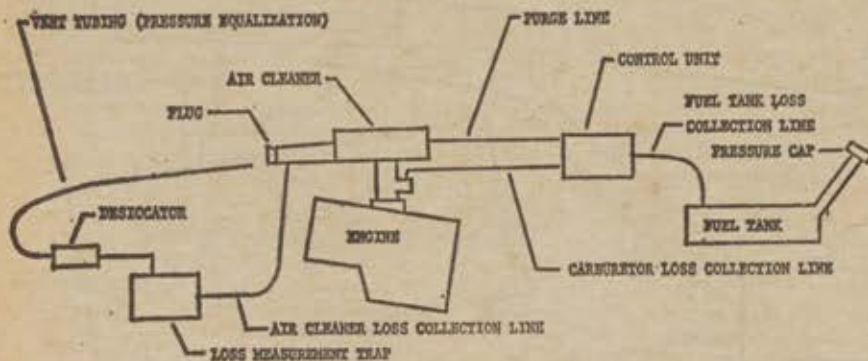


FIGURE B 77-8 - Typical fuel evaporative loss collection arrangement for vehicle equipped with evaporative emission control system (schematic).

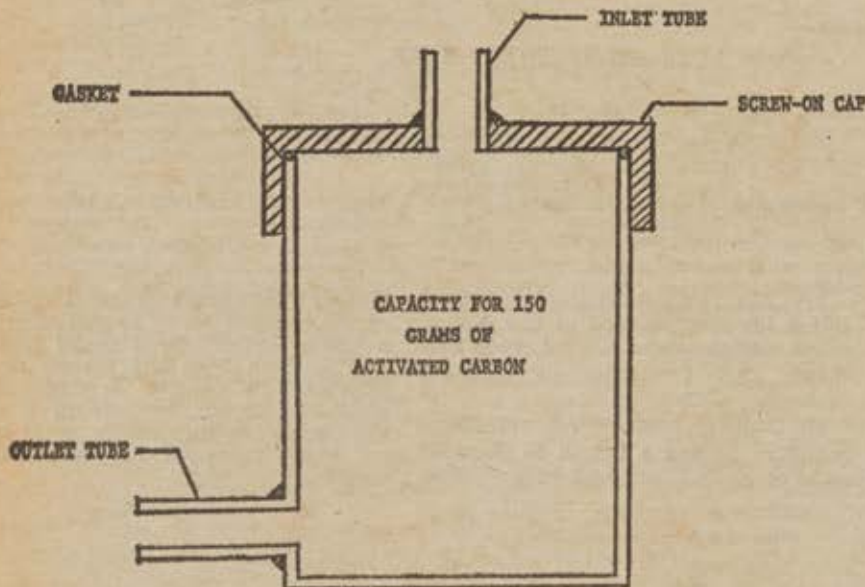


FIGURE B 77-9 - Typical activated carbon trap (schematic).

(1) Activated carbon-meeting the following specifications:

Surface area, min. (N₂ BET method),¹ 1,000 square meters per gram.

Adsorption capacity, min. (carbon tetrachloride), 60 percent, by weight.

Volatile material including adsorbed water vapor, None.

Screen analysis size:	Percent
Less than 1.4 mm.....	0
1.7 to 2.4 mm.....	90-100
More than 3 mm.....	0

The activated carbon trap is prepared for the test by attaching clamped sections of vinyl tubing to the inlet and outlet tubes of the canister. The canis-

ter is then filled with 150±10 g hot activated carbon which had previously been oven-dried for 3 hours at 300° F. Loss of carbon through the inlet and outlet tubes is prevented through the use of wire screens of 0.7 mm. mesh or wads of loosely packed glass wool. The canister is closed immediately after filling and the carbon is allowed to cool while the trap is vented through a drying tube via the unclamped outlet arm.

(iii) The trap is sealed and weighed after cooling and the weight, to the nearest 0.1 gram, is inscribed on the canister body. Within 12 hours of the scheduled test, the weight of the trap is checked and if it has changed by more than 0.5 gm., it is redried to constant weight. This redrying operation is performed by passing dry nitrogen, heated to 275° F. through the trap, via the inlet tube, at a rate of 1 liter per minute until checks made at 30-minute intervals do not vary by more than 0.1 percent of the gross weight. The trap and its contents are allowed to cool to room temperature, while vented through a drying tube via the outlet arm, before use.

(2) Auxiliary collection equipment.

(1) Drying tube—transparent, tubular body 3/4-inch ID, 6 inches long, with serrated tips and removable caps.

(ii) Desiccant—indicating variety, 4 mesh. The drying tube is attached to the outlet tube of the collection traps to prevent ambient moisture from entering the trap. It is prepared by filling the empty drying tube with fresh desiccant using a loose wad of glass wool to hold the desiccant in place. The desiccant is renewed when three-quarters spent, as indicated by color change.

(iii) Collection tubing—stainless steel, aluminum, or other suitable material approved by the Administrator, 5/16-inch ID, for connecting the collection traps to the fuel system vents.

(iv) Polyvinyl chloride (vinyl) tubing—flexible tubing, 5/16-inch ID, for sealing butt-to-butt joints.

(v) Laboratory tubing—air tight flexible tubing 5/16-inch ID, attached to the outlet end of the drying tubes to equalize collection system pressure.

(vi) Clamps—hosecock, outside, for pinching off flexible tubing.

(c) Weighing equipment. The balance and weights used shall be capable of determining the net weight of the activated carbon trap within an accuracy of ±75 mg.

(d) Temperature measuring equipment. (1) Temperature recorder—multichannel, variable speed, potentiometric, or substantially equivalent, recorder with a temperature range of 50° F. to 100° F. and capable of either simultaneous or sequential recording of the ambient air and fuel temperatures within an accuracy of ±1° F.

(2) Fuel tank thermocouples—iron-constantan (type J) construction.

¹ Brunauer, Emmett & Teller: Journal of the American Chemical Society, Vol. 60, p. 309, 1938.

(3) Other types of temperature sensing systems may be provided by the manufacturer if they record the information specified in paragraph (d) (1) of this section with the required accuracy and if they are self-contained. Type J thermocouples are required for compatibility with recording instruments used in Federal certification facilities.

(e) *Assembly and use of the activated carbon vapor collection system.* (1) The prepared activated carbon trap, dried to constant weight, cooled to the ambient temperature, and sealed with clamped sections of vinyl tubing is carefully weighed to the nearest 20 milligrams and the weight recorded as the "tare weight."

(2) A drying tube is attached to the outlet tube and the clamp released, but not removed. A length of flexible tubing, for pressure equalization, is connected to the other end of the drying tube.

(3) The inlet of the adsorption trap and external vent(s) of the fuel system will be connected by minimal lengths of stainless steel or aluminum tubing and short sections of vinyl tubing. Butt-to-butt joints shall be made wherever possible and precautions taken against sharp bends in the connection lines, including any manifold systems employed to connect multiple vents to a single trap.

(4) The clamp on the inlet tube of the trap shall be released but not removed. Care shall be exercised to prevent heating the vapor collection trap by radiant or conductive heat from the engine.

(5) Upon completion of the collection sequence, the vinyl tubing sections on each arm of the collection trap shall be clamped tight and the collection system dismantled.

(6) The sealed vapor collection trap shall be weighed carefully to the nearest 20 milligrams. This constitutes the "gross weight," which is appropriately recorded. The difference between the "gross weight" and "tare weight" represents the "net weight" for purposes of calculating the fuel vapor losses.

§ 86.177-18 Information to be recorded.

The following information shall be recorded with respect to each test:

- Test number.
- System or device tested (brief description).
- Date and time of day for each part of the test schedule.
- Instrument operator.
- Driver or operator.
- Vehicle: Make—Vehicle identification number—Model year—Transmission type—Odometer reading—Engine displacement—Engine family—Idle r.p.m.—Fuel system (fuel injection, nominal

fuel tank capacity, fuel tank location, number of carburetors, number of carburetor barrels, as applicable)—Inertia loading—Actual curb weight recorded at 0 miles—Actual road load horsepower at 50 m.p.h., and Drive wheel tire pressure.

(g) Indicated road load power absorption at 50 m.p.h. and dynamometer serial number. As an alternative to recording the dynamometer serial number, a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided, the test cell records show the pertinent information.

(h) All pertinent instrument information such as tuning—gain—serial number—detector number—range. As an alternative, a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided test cell calibration records show the pertinent instrument information.

(i) Recorder charts: Identify zero, span, exhaust gas, and dilution air sample traces.

(j) Test cell barometric pressure, ambient temperature, and humidity.

Note: A central laboratory barometer may be used, provided, that individual test cell barometric pressures are shown to be within ± 0.1 percent of the barometric pressure at the central barometer location.

(k) Fuel temperatures, as prescribed (gasoline-fueled only).

(l) Pressure of the mixture of exhaust and dilution air entering the positive displacement pump, the pressure increase across the pump, and the temperature set point of the temperature control system. The sample temperature at the inlet to the pump may be measured, if desired, to verify that the temperature variations are within 5° F, of the set point.

(m) The number of revolutions of the positive displacement pump accumulated while the test is in progress and exhaust flow samples are being collected.

(n) The humidity of the dilution air.

Note: If conditioning columns are not used (see § 86.177-18(a)(3)(xi) and § 86.177-18(b)(3)(xi)), this measurement can be deleted. If the conditioning columns are used and the dilution air is taken from the test cell, the ambient humidity can be used for this measurement.

(o) Temperature set point of the heated sample line and heated hydrocarbon detector temperature control system (for Diesel vehicles only).

§ 86.177-19 Analytical system calibration and sample handling.

(a) Calibrate the analytical assembly at least once every 30 days. Use the same flow rate as when analyzing samples.

(1) Adjust analyzers to optimize performance. For Diesel vehicles, operate the heated hydrocarbon analyzer, sampling line and filter to $\pm 10^\circ$ F in the temperature range of 300 to 390° F.

(2) Zero the hydrocarbon analyzer with zero-grade air and the carbon monoxide, carbon dioxide, and oxides of nitrogen analyzers with zero-grade air or zero-grade nitrogen. The allowable zero gas impurity concentrations should not exceed 1 p.p.m. equivalent carbon response, 1 p.p.m. carbon monoxide, 400 p.p.m. (0.04 mole percent) carbon dioxide, and 0.1 p.p.m. nitric oxide.

(3) Set the CO and CO₂ analyzer gains to give the desired ranges. Select the desired attenuation scale of the HC analyzer, set the sample capillary flow rate by adjusting the back pressure regulator, and adjust the electronic gain control, if provided, to give the desired range. Select the desired scale of the NO_x analyzer and adjust the phototube high voltage supply or amplifier gain to give the desired range.

(4) Calibrate the HC analyzer with propane (air diluent) gases having nominal concentrations equal to 50 and 100 percent of full scale. Calibrate the CO analyzer with carbon monoxide (nitrogen diluent) gases and the CO₂ analyzer with carbon dioxide (nitrogen diluent) gases having nominal concentrations equal to 10, 25, 40, 50, 60, 70, 85, and 100 percent of full scale. Calibrate the NO_x analyzer with nitric oxide (nitrogen diluent) gases having nominal concentrations equal to 50 and 100 percent of full scale. The actual concentrations should be known to within ± 2 percent of the true values.

(5) Compare values obtained on the CO and CO₂ analyzers with previous calibration curves. Any significant change reflects some problem in the system. Locate and correct problem, and recalibrate. Use best judgement in selecting curves for data reduction.

(6) NO_x converter efficiency determination: The apparatus described and illustrated in Figure B77-10 or Figure B77-11 is to be used to determine the conversion efficiency of devices that convert NO_x to NO. The following procedure is to be used for determining the values to be used in Equation (A).

(i) Attach the NO/N₂ supply (150-250 ppm) at C2, the O₂ supply at C1 and the analyzer inlet connection to the efficiency detector at C3. If lower concentrations of NO are used, air may be used in place of O₂, to facilitate better control of the NO, generated during step (iv).

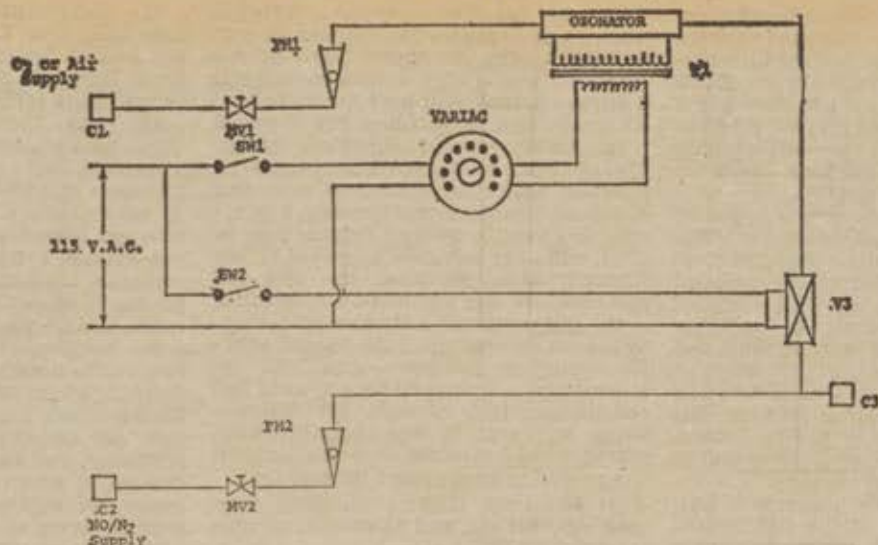


Figure 3-77-10 - NOx Converter Efficiency Detector

(ii) With the efficiency detector variac off, place the NO_x converter in bypass mode and close valve V3. Open valve MV1 until sufficient flow and stable readings are obtained at the analyzer. Zero and span the analyzer output to indicate the value of the NO concentration being used. Record this concentration.

(iii) Open valve V3 (on/off flow control solenoid valve for O₂) and adjust valve MV1 (O₂ supply metering valve) to blend enough O₂ to lower the NO concentration (ii) about 10 percent. Record this concentration.

(iv) Turn on the ozonator and increase its supply voltage until the NO concentration of (iii) is reduced to about 20 percent of (ii). NO_x is now being formed from the NO + O₃ reaction. There must always be at least 10 percent unreacted NO at this point. Record this concentration.

(v) When a stable reading has been obtained from (iv), place the NO_x converter in the convert mode. The analyzer will now indicate the total NO_x concentration. Record this concentration.

(vi) Turn off the ozonator and allow the analyzer reading to stabilize. The mixture NO + O₂ is still passing through the converter. This reading is the total NO_x concentration of the dilute NO span gas

used at step (iii). Record this concentration.

(vii) Close valve V3. The NO concentration should be equal to or greater than the reading of (ii) indicating whether the NO contains any NO₂. Calculate the efficiency of the NO_x converter by substituting the concentrations obtained during the test into Equation (A).

$$\text{Percent Eff.} = \frac{(v) - (iv)}{(vi) - (iv)} \times 100 \text{ percent (A)}$$

The efficiency of the converter should be greater than 90 percent. Adjustment of the converter temperature may be needed to maximize the efficiency. Efficiency checks should be made on each analyzer range using an NO span gas concentration appropriate to the instrument range. See alternate procedure in paragraph (a) (6) (viii).

(viii) Alternative to paragraph (a) (6) (vii): Close valve V3. The NO concentration should be equal to or greater than the reading of (ii) indicating whether the NO contains any NO₂.

Calculate the efficiency of the NO converter by substituting the concentrations obtained during the test into Equation (B).

$$\text{Percent Eff.} = 1 + \frac{(v-vi)}{(iii-iv)} \times 100 \text{ percent (B)}$$

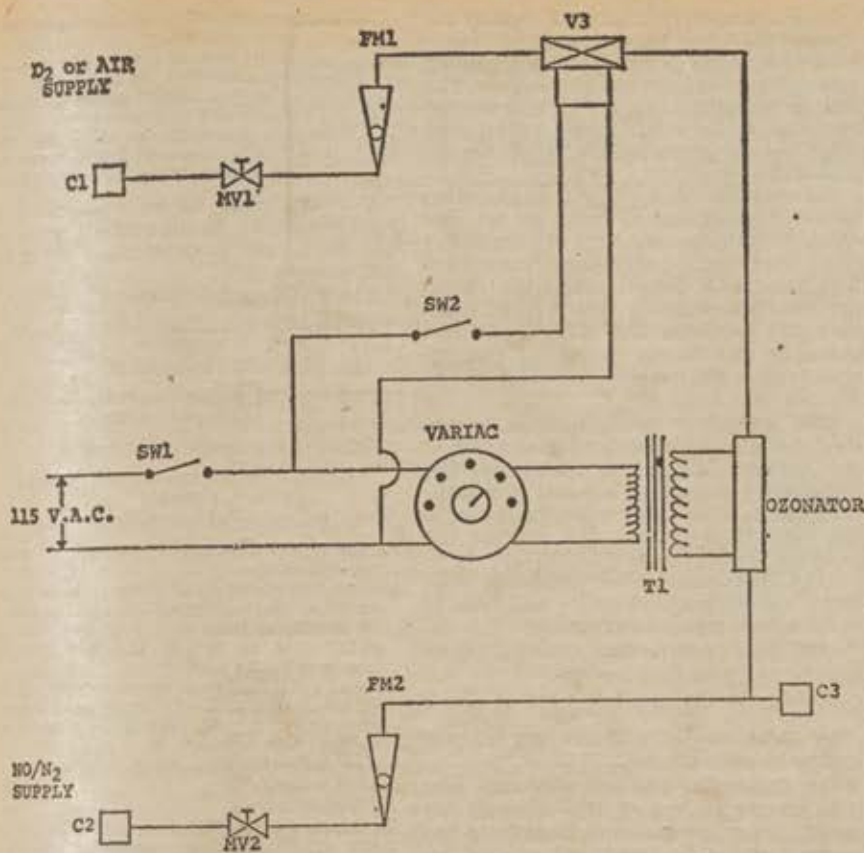


Figure B 77-11" - NOx Converter Efficiency Detector

The efficiency of the converter should be greater than 90 percent. Adjusting the converter temperature may be needed to maximize the efficiency. Although steps (ii) and (vii) are not used in the calculations, their values should be recorded to complete the data set for the test sequence. This procedure does not depend on the amount of NO_x in the span gas nor the equivalence of flows in the gas nor the equivalence of flows in the bypass and converter modes; however, to be consistent with good operating practice, flows should be nominally the same, and the NO_x concentration should be less than 5 percent of the NO_x span concentration. Efficiency checks should be made at a frequency (daily to weekly) consistent with good quality assurance provisions.

(7) Check the efficiency of the sample conditioning system, if used, by the following procedure:

- (i) Zero and span the CO instrument on its most sensitive scale.
- (ii) Recheck zero.
- (iii) Bubble a mixture of 3 percent CO₂ in N₂ through water at room temperature (68°-86° F), through the conditioning column into the CO instrument. If the response meets the criteria of § 86.177-16(a) (3) (xi) or § 86.177-16(b) (3) (xi) as applicable, then the conditioning

column is functioning acceptably. If the response is higher than the specified limit, a new conditioning column should be installed and the test repeated.

(iv) Sample conditioning systems should be checked at a frequency consistent with observed column life or when the indicator of the column packing begins to show deterioration.

(b) HC, CO, CO₂, and NO_x measurements: (When testing Diesel vehicles allow the HC analyzer sample line and filter to heat to a set point $\pm 10^\circ$ F between 300 and 390° F.) Allow a minimum of 20 minutes warmup for the HC analyzer and 2 hours for the CO, CO₂, and NO_x analyzers. (Power is normally left on infrared and CL analyzers; but when not in use, the chopper motors of the infrared analyzers are turned off and the phototube high voltage supply of the CL analyzer is placed in the standby position.) The following sequence of operations should be performed in conjunction with each series of measurements:

- (1) Zero the analyzers. Obtain a stable zero on each amplifier meter and recorder. Recheck after tests.
- (2) Introduce span gases and set the CO and CO₂ analyzer gains, the HC analyzer sample capillary flow rate and the NO_x analyzer high voltage supply

or amplifier gain to match the calibration curves. In order to avoid corrections, span and calibrate at the same flow rates used to analyze the test samples. Span gases should have concentrations equal to approximately 80 percent of full scale. If gain has shifted significantly on the CO or CO₂ analyzers, check tuning. If necessary, check calibration. Recheck after test. Show actual concentrations on chart.

(3) Check zeros; repeat the procedure in paragraphs (b) (1) and (2) of this section if required.

(4) Check flow rates and pressures.

(5) For Diesel vehicles continuously record (and integrate electronically if desired) dilute hydrocarbon emission levels during test.

(6) Measure CO, CO₂, and NO_x concentrations of samples, also HC for gasoline-fueled vehicles. Care should be exercised to prevent moisture from condensing in the sample collection bag.

(7) Check zero and span points.

(c) For the purposes of this section, the term "zero-grade air" includes artificial "air" consisting of a blend of nitrogen and oxygen with oxygen concentrations between 18 and 21 mole percent.

§ 86.177-20, Dynamometer test runs.

(a) The vehicle shall be allowed to stand with the engine turned off for a period of not less than 12 hours before the cold-start exhaust-emission test (gasoline-fueled vehicles shall be stored at an ambient temperature specified in § 86.177-8 and § 86.177-9). The vehicle shall be stored prior to the emission tests in such a manner that precipitation (e.g. rain or dew) does not occur on the vehicle. The complete dynamometer test consists of a cold-start drive of 7.5 miles and simulates a hot-start drive of 7.5 miles. The vehicle is allowed to stand on the dynamometer during the 10-minute time period between the cold- and hot-start tests. The cold start test is divided into two periods. The first period representing the cold-start "transient" phase, terminates at the end of the deceleration which is scheduled to occur at 505 seconds of the driving schedule. The second period, representing the "stabilized" phase, consists of the remainder of driving schedule including engine shutdown. The hot-start test similarly consists of two periods. The first period, representing the hot-start "transient" phase, terminates at the same point in the driving schedule as the first phase of the cold-start test. The second period of the hot-start test, "stabilized" phase, is assumed to be identical to the second period of the cold-start test. Therefore, the hot-start test terminates after the first period (505 seconds) is run. During the tests the ambient temperature shall be between 68° F. and 86° F.

(b) The following steps shall be taken for each test:

- (1) Place drive wheels of vehicle on dynamometer without starting engine.
- (2) Open the vehicle engine compartment cover and start the cooling fan.
- (3) With the sample solenoid valves in the "dump" position connect evacuated sample collection bags to the two

dilute exhaust sample connectors and to the two dilution air sample line connectors.

(4) Start the positive displacement pump (if not already on), the sample pumps, heated hydrocarbon analysis recorder (Diesel only), and the temperature recorder. (The heat exchanger of the constant volume sampler, the Diesel hydrocarbon analyzer continuous sample line, and filter (if applicable) should be preheated to their respective operating temperatures before the test begins.)

(5) Adjust the sample flow rates to the desired flow rate (minimum of 10 c.f.h.) and set the revolution counters to zero. Also set Diesel hydrocarbon integrator counters to zero, if applicable.

(6) Attach the flexible exhaust tube to the vehicle tailpipe(s).

(7) Simultaneously start the revolution counter for the positive displacement pump, position the sample solenoid valves to direct the sample flow into the "transient" exhaust sample bag and the "transient" dilution air sample bag, (turn on the Diesel hydrocarbon analyzer system integrator and mark the recorder chart, if applicable), and start cranking the engine.

(8) Fifteen seconds after the engine starts, place the transmission in gear.

(9) Twenty seconds after the engine starts, begin the initial vehicle acceleration of the driving schedule.

(10) Operate the vehicle according to the dynamometer driving schedule (§ 86.177-10).

(11) At the end of the deceleration which is scheduled to occur at 505 seconds, simultaneously switch the sample flows from the "transient" bags to the "stabilized" bags, switch off revolution counter No. 1 (and the Diesel hydrocarbon integrator No. 1, mark the Diesel hydrocarbon recorder chart), and start counter No. 2 (and the Diesel hydrocarbon integrator No. 2). As soon as possible and in no case longer than 20 minutes after the end of this portion of the test disconnect the "transient" exhaust and dilution air sample bags, transfer them to the analytical system and process the samples according to § 86.177-19.

(12) Turn the engine off 2 seconds after the end of the last deceleration (at 1,369 seconds).

(13) Five seconds after the engine stops running, simultaneously turn off revolution counter No. 2 (and the Diesel hydrocarbon integrator No. 2, mark the hydrocarbon recorder chart, if applicable) and position the sample solenoid valves to the "dump" position. As soon as possible and in no case longer than 20 minutes after the end of this portion of the test disconnect the "stabilized" exhaust and dilution air sample bags, transfer them to the analytical system, and process the samples according to § 86.177-19.

(14) Immediately after the end of the sample period turn off the cooling fan and close the engine compartment cover.

(15) Turn off the positive displacement pump or disconnect the exhaust tube from the tailpipe(s) of the vehicle.

(16) Repeat the steps in paragraphs

(b) (2) through (10) of this section for the hot start test except only one evacuated sample bag is required for sampling exhaust gas and one for dilution air. The step in paragraph (b) (7) of this section shall begin between 9 and 11 minutes after the end of the sample period for the cold-start test.

(17) At the end of the deceleration which is scheduled to occur at 505 seconds, simultaneously turn off the No. 1 revolution counter (and Diesel hydrocarbon integrator No. 1, mark the Diesel hydrocarbon recorder chart, if applicable) and position the sample solenoid valve to the "dump" position. (Engine shutdown is not part of the hot-start test sample period.)

(18) As soon as possible and in no case longer than 20 minutes after the end of this portion of the test disconnect the hot-start "transient" exhaust and dilution air sample bags, transfer them to the analytical system and process the samples according to § 86.177-19.

(19) Disconnect the exhaust tube from the vehicle tailpipe(s) and remove vehicle from dynamometer.

(20) The positive displacement pump may be turned off, if desired.

§ 86.177-21 Chart reading.

(a) *Gasoline-fueled light-duty vehicles and light-duty trucks.*

(1) Determine the HC, CO, CO₂, and NO_x concentration of the dilution air and dilute exhaust sample bags from the instrument deflections or recordings making use of appropriate calibration charts.

(2) Determine the average dilute exhaust mixture temperatures from the temperature recorder trace if the recorder is used.

(b) *Diesel light-duty vehicles and light-duty trucks.*

(1) Determine the HC, CO, CO₂, and NO_x concentrations of the dilution air and the CO, CO₂, and NO_x concentration of the dilute exhaust sample bags from the instrument deflections, computer printout, or recordings making use of appropriate calibration charts.

(2) Record integrated HC results, or manually integrate continuous chart. This chart provides a permanent record and can be graphically integrated if verification of the results of electronic integration is required.

(3) Determine the average dilute exhaust mixture temperatures from the temperature recorder trace if a recorder is used.

§ 86.177-22 Calculations (exhaust emissions).

The final reported test results shall be computed by use of the following formula:

(a) *For light-duty vehicles and light-duty trucks:*

$$Y_{wm} = (0.43 Y_{ct} + 0.57 Y_{ht} + Y_s) / 7.5$$

Where:

Y_{wm} —Weighted mass emissions of each pollutant, i.e., HC, CO, or NO_x, in grams per vehicle mile.

Y_{ct} —Mass emissions as calculated from the "transient" phase of the cold start test, in grams per test phase.
 Y_{ht} —Mass emissions as calculated from the "transient" phase of the hot start test, in grams per test phase.
 Y_s —Mass emissions as calculated from the "stabilized" phase of the cold start test, in grams per test phase.

(b) The mass of each pollutant for each phase of both the cold-start test and hot-start test is determined from the following:

(1) Hydrocarbon Mass:

$$HC_{mass} = V_{mix} \times \text{Density}_{HC} \times HC_{conc} / 1,000,000$$

(2) Oxides of nitrogen Mass:

$$NO_{x, mass} = V_{mix} \times \text{Density}_{NO_x} \times (NO_{x, conc} / 1,000,000) \times KH$$

(3) Carbon monoxide Mass:

$$CO_{mass} = V_{mix} \times \text{Density}_{CO} \times CO_{conc} / 1,000,000$$

(c) Meaning of symbols:

HC_{mass} —Hydrocarbon emissions, in grams per test phase.

Density_{HC} —Density of hydrocarbons in the exhaust gas, assuming an average carbon to hydrogen ratio of 1:1.85, in grams per cubic foot at 68° F. and 760 mm. Hg. pressure (16.33 g/cu. ft.).

HC_{conc} —Hydrocarbon concentration of the dilute exhaust sample corrected for background, in p.p.m. carbon equivalent, i.e. equivalent propane x 3.

$$HC_{conc} = HCE - HCD \quad (1-1/DF)$$

Where:

HCE —Average hydrocarbon concentrations of the dilute exhaust sample as measured from the sample bag or as calculated from the integrated HC traces, in p.p.m. carbon equivalent.

HCD —Hydrocarbon concentration of the dilution air as measured in p.p.m. carbon equivalent.

$NO_{x, mass}$ —Oxides of nitrogen emissions, in grams per test phase.

Density_{NO_x} —Density of oxides of nitrogen in the exhaust gas, assuming they are in the form of nitrogen dioxide, in grams per cubic foot at 68° F. and 760 mm. Hg. pressure (54.16 g/cu. ft.).

$NO_{x, conc}$ —Oxides of nitrogen concentration of the dilute exhaust sample corrected for background, in p.p.m.

$$NO_{x, conc} = NO_{x, e} - NO_{x, d} \quad (1-1/DF)$$

Where:

$NO_{x, e}$ —Oxides of nitrogen concentration of the dilute exhaust sample as measured, in p.p.m.

$NO_{x, d}$ —Oxides of nitrogen concentration of the dilution air as measured, in p.p.m.

CO_{mass} —Carbon monoxide emissions, in grams per test phase.

Density_{CO} —Density of carbon monoxide in grams per cubic foot at 68° F. and 760 mm. Hg. pressure (32.97 g/cu. ft.).

CO_{conc} —Carbon monoxide concentration of the dilute exhaust sample corrected for background, water vapor and CO₂ extraction, in p.p.m.

$$CO_{conc} = CO_e - CO_d \quad (1-1/DF)$$

Where:

CO_e —Carbon monoxide concentration of the dilute exhaust sample volume corrected for water vapor and carbon dioxide extraction, in p.p.m. The calculation assumes the carbon to hydrogen ratio of the fuel is 1:1.85.

$$CO_e = (1 - 0.01925 CO_2e - 0.000823R) CO_{em}$$

Where:

- COem=Carbon monoxide concentration of the dilute exhaust sample as measured in p.p.m.
- COe=Carbon dioxide concentration of the dilute exhaust sample, in mole percent.
- R=Relative humidity of the dilution air, in percent. (see § 86.177-18(n).)
- COd=Carbon monoxide concentration of the dilution air corrected for water vapor extraction, in p.p.m.
- COd=(1-0.000323R) COdm

Where:

- COdm=Carbon monoxide concentration of the dilution air sample as measured, in p.p.m.

NOTE: If a CO instrument which meets the criteria specified in § 86.177-16(a)(3)(xi) or § 86.177-16(b)(3)(xi) is used and the conditioning column has been deleted, COem can be substituted directly for COe and COdm can be substituted directly for COd.

$$DF = \frac{13.4}{CO_m + (HC_e + CO_e) \times 10^{-4}}$$

Vmix=Total dilute exhaust volume in cubic feet per test phase corrected to standard conditions (528°R and 760 mm. Hg).

$$Vmix = V_o \times N \frac{(P_a - P_i) (528^{\circ}R)}{(760 \text{ mm. Hg}) (T_p)}$$

Where:

- Vo=Volume of gas pumped by the positive displacement pump, in cubic feet per revolution. This volume is dependent on the pressure differential across the positive displacement pump. (See calibration techniques in Appendix III).
- N=Number of revolutions of the positive displacement pump during the test phase while samples are being collected.
- PB=Barometric pressure in mm. Hg.
- Pi=Pressure depression below atmospheric measured at the inlet to the positive displacement pump.
- Tp=Average temperature of dilute exhaust entering positive displacement pump during test while samples are being collected, in degrees Rankine.
- KH=Humidity correction factor.

$$KH = 1/1 - 0.0047 (H - 75)$$

NOTE: The constant 0.0047 will be updated to reflect any data which becomes available on light-duty Diesel engine tests.

Where:

- H=Absolute humidity in grains of water per pound of dry air.
- H=((43.478) Ra X Pd)/(PB-(Pd X Ra/100))
- Ra=Relative humidity of the ambient air, in percent.
- Pd=Saturated vapor pressure, in mm. Hg at the ambient dry bulb temperature.

(d) Example calculation of mass emissions values:

(1) For the "transient" phase of the cold-start test assume Vo=0.29344 cu. ft. per revolution; N=10,485; R=48.0 percent; Ra=48.2 percent; PB=762 mm. Hg; Pd=22.225 mm. Hg; Pi=70 mm. Hg; Tp=570° R; HCe=105.8 p.p.m. carbon equivalent; NOe=11.2 p.p.m.; COem=306.6 p.p.m.; COe=1.43 percent; Hcd=12.1 p.p.m.; NOd=0.8 p.p.m.; COdm=15.3 p.p.m. Then:

- Vmix=(0.29344) (10,485) (762-70) (528)/(760) (570)=2595.0 cu. ft. per test phase.
- H=(43.478) (48.2) (22.225)/762-(22.225X48.2/100)
- KH=1/1-0.0047(62-75)=.9424.
- COe=(1-0.01925(1.43)-0.000323(48)) 306.6=293.4 p.p.m.
- COd=(1-0.000323(48)) 15.3=15.1 p.p.m.
- DF=13.4/1.43+(105.8+293.4)X10⁻⁴=9.116.
- HConc=105.8-12.1(1-1/9.116)=95.03.
- HComass=(2595) (16.33) (95.03/1,000,000)=4.027 grams per test phase.
- NO₂conc=11.2-0.8(1-1/9.116)=10.49
- NO₂conc=(2595) (54.16) (10.49/1,000,000) (0.9424)=1.389 grams per test phase.
- COconc=293.4-15.1(11/9.116)=280.
- COMass=(2595) (82.97) (280.1,000,000)=23.96 grams per test phase.

(2) For the "stabilized" portion of the cold-start test assume that similar calculations resulted in HComass=0.62 grams per test phase; NO₂mass=1.27 grams per test phase; and COMass=5.98 grams per test phase.

(3) For the "transient" portion of the hot-start test assume that similar calculations resulted in HComass=0.51 grams per test phase; NO₂mass=1.38 grams per test phase; and COMass=5.01 grams per test phase.

(4) Results:

- HCwm=((0.43) (4.027)+(0.57) (0.51)+0.62)/7.5=0.352 grams per vehicle mile.
- NO₂wm=((0.43) (1.389)+(0.57) (1.38)+1.27)/7.5=0.354 grams per vehicle mile.
- COwm=((0.43) (23.96)+(0.57) (5.01)+5.98)/7.5=2.55 grams per vehicle mile.

§ 86.177-23 Calculations (fuel evaporative emissions, gasoline-fueled vehicles).

The net weights of the individual collection traps employed in § 86.177-9 shall be added together to determine compliance with the fuel evaporative emission standard.

APPENDIX I—URBAN DYNAMOMETER DRIVING SCHEDULES

(a) EPA Urban Dynamometer Driving Schedule for Light-Duty Vehicles and Light-Duty Trucks.

APPENDIX I

EPA URBAN DYNAMOMETER DRIVING SCHEDULE (Speed versus Time Sequence)

Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)
0	0.0	22	5.0	44	17.1
1	0.0	23	5.0	45	19.1
2	0.0	24	11.5	46	21.1
3	0.0	25	14.3	47	22.7
4	0.0	26	16.0	48	22.9
5	0.0	27	17.3	49	22.7
6	0.0	28	18.1	50	22.6
7	0.0	29	20.7	51	21.3
8	0.0	30	21.7	52	19.0
9	0.0	31	22.4	53	17.1
10	0.0	32	22.5	54	15.8
11	0.0	33	22.1	55	15.8
12	0.0	34	21.5	56	17.7
13	0.0	35	20.9	57	19.8
14	0.0	36	20.4	58	21.8
15	0.0	37	19.8	59	23.3
16	0.0	38	17.0	60	24.3
17	0.0	39	14.9	61	24.6
18	0.0	40	14.9	62	24.8
19	0.0	41	15.3	63	25.8
20	0.0	42	15.8	64	24.6
21	2.0	43	16.0	65	24.8

RULES AND REGULATIONS

APPENDIX I—Continued

Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)
66	24.7	147	0.0	228	51.9
67	24.8	148	0.0	229	55.0
68	24.7	149	0.0	230	54.9
69	24.6	150	0.0	231	54.6
70	24.6	151	0.0	232	54.6
71	25.1	152	0.0	233	54.8
72	25.6	153	0.0	234	55.1
73	25.7	154	0.0	235	55.5
74	25.4	155	0.0	236	55.7
75	24.9	156	0.0	237	56.1
76	25.0	157	0.0	238	56.3
77	25.4	158	0.0	239	56.6
78	26.0	159	0.0	240	56.7
79	26.0	160	0.0	241	56.7
80	25.7	161	0.0	242	56.5
81	26.1	162	0.0	243	56.5
82	26.7	163	0.0	244	56.5
83	27.5	164	3.3	245	56.5
84	28.0	165	6.6	246	56.5
85	29.3	166	9.9	247	56.5
86	29.3	167	13.2	248	56.4
87	30.1	168	16.5	249	56.1
88	30.4	169	19.8	250	55.8
89	30.7	170	22.2	251	55.1
90	30.7	171	24.3	252	54.6
91	30.5	172	25.8	253	54.2
92	30.4	173	26.4	254	54.0
93	30.3	174	25.7	255	53.7
94	30.4	175	25.1	256	53.6
95	30.8	176	24.7	257	53.9
96	30.4	177	25.0	258	54.0
97	29.9	178	25.2	259	54.1
98	29.5	179	25.4	260	54.1
99	29.8	180	25.8	261	53.8
100	30.3	181	27.2	262	53.4
101	30.7	182	28.5	263	55.0
102	30.9	183	24.0	264	52.6
103	31.0	184	22.7	265	52.1
104	30.9	185	19.4	266	52.4
105	30.4	186	17.7	267	52.0
106	29.8	187	17.2	268	51.0
107	29.9	188	18.1	269	51.7
108	30.2	189	18.6	270	51.9
109	30.7	190	20.0	271	51.6
110	31.2	191	22.2	272	51.6
111	31.8	192	24.5	273	52.8
112	32.2	193	27.3	274	52.1
113	32.4	194	30.5	275	53.5
114	32.2	195	33.6	276	53.5
115	31.7	196	36.2	277	54.0
116	28.0	197	37.3	278	54.9
117	25.3	198	39.3	279	55.4
118	22.0	199	40.5	280	55.6
119	18.7	200	42.1	281	56.0
120	15.4	201	43.8	282	56.8
121	12.1	202	45.1	283	55.8
122	8.8	203	46.0	284	55.2
123	5.5	204	46.8	285	54.5
124	2.2	205	47.5	286	53.6
125	0.0	206	47.5	287	52.5
126	0.0	207	47.3	288	51.5
127	0.0	208	47.2	289	51.5
128	0.0	209	47.0	290	51.5
129	0.0	210	47.0	291	51.1
130	0.0	211	47.0	292	50.1
131	0.0	212	47.0	293	50.0
132	0.0	213	47.0	294	50.1
133	0.0	214	47.2	295	50.0
134	0.0	215	47.4	296	49.5
135	0.0	216	47.9	297	49.5
136	0.0	217	48.5	298	49.5
137	0.0	218	49.1	299	49.5
138	0.0	219	49.5	300	49.1
139	0.0	220	50.0	301	48.6
140	0.0	221	50.6	302	48.1
141	0.0	222	51.0	303	47.2
142	0.0	223	51.5	304	46.1
143	0.0	224	52.2	305	45.0
144	0.0	225	53.2	306	43.8
145	0.0	226	54.1	307	42.6
146	0.0	227	54.6	308	41.5

APPENDIX I—Continued

Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)
309	40.3	390	20.3	471	36.0
310	35.5	391	17.5	472	35.6
311	37.0	392	14.5	473	35.5
312	35.2	393	12.0	474	35.4
313	33.8	394	8.7	475	35.2
314	32.5	395	5.4	476	35.2
315	31.5	396	2.1	477	35.2
316	30.8	397	0.0	478	35.2
317	30.5	398	0.0	479	35.2
318	30.0	399	0.0	480	35.2
319	29.0	400	0.0	481	35.0
320	27.5	401	0.0	482	34.1
321	24.8	402	0.0	483	33.2
322	21.5	403	2.5	484	33.5
323	20.1	404	5.9	485	33.2
324	19.1	405	9.2	486	33.0
325	18.5	406	12.5	487	33.0
326	17.0	407	15.8	488	33.0
327	15.5	408	19.1	489	34.8
328	12.5	409	22.4	490	34.6
329	10.8	410	25.0	491	34.5
330	8.0	411	25.6	492	33.5
331	4.7	412	27.5	493	32.0
332	1.4	413	29.0	494	30.1
333	0.0	414	30.0	495	28.0
334	0.0	415	30.1	496	25.5
335	0.0	416	30.0	497	22.5
336	0.0	417	29.7	498	19.8
337	0.0	418	29.3	499	18.5
338	0.0	419	28.8	500	13.2
339	0.0	420	28.0	501	10.2
340	0.0	421	25.0	502	7.2
341	0.0	422	21.7	503	4.0
342	0.0	423	18.4	504	1.0
343	0.0	424	15.1	505	0.0
344	0.0	425	11.8	506	0.0
345	0.0	426	8.5	507	0.0
346	0.0	427	5.2	508	0.0
347	1.0	428	1.9	509	0.0
348	4.3	429	0.0	510	0.0
349	7.6	430	0.0	511	1.2
350	10.9	431	0.0	512	3.5
351	14.2	432	0.0	513	5.5
352	17.3	433	0.0	514	6.5
353	20.0	434	0.0	515	8.5
354	22.5	435	0.0	516	9.8
355	23.7	436	0.0	517	10.5
356	25.2	437	0.0	518	11.9
357	26.6	438	0.0	519	14.0
358	28.1	439	0.0	520	16.0
359	30.0	440	0.0	521	17.7
360	30.8	441	0.0	522	19.0
361	31.6	442	0.0	523	20.1
362	32.1	443	0.0	524	21.0
363	32.8	444	0.0	525	22.0
364	33.6	445	0.0	526	23.0
365	34.5	446	0.0	527	23.8
366	34.6	447	0.0	528	24.5
367	34.9	448	3.3	529	24.9
368	34.8	449	6.6	530	25.0
369	34.5	450	9.9	531	25.0
370	34.7	451	13.2	532	25.0
371	35.5	452	16.5	533	25.0
372	36.0	453	19.8	534	25.0
373	36.0	454	23.1	535	25.0
374	36.0	455	26.4	536	25.6
375	36.0	456	27.8	537	25.8
376	36.0	457	29.1	538	26.0
377	36.0	458	31.5	539	25.0
378	36.1	459	33.0	540	25.0
379	36.4	460	33.6	541	25.2
380	36.5	461	34.8	542	25.0
381	36.4	462	35.1	543	25.0
382	36.0	463	35.6	544	24.0
383	35.1	464	36.1	545	23.4
384	34.1	465	36.9	546	19.0
385	33.5	466	36.1	547	16.5
386	31.4	467	30.2	548	13.2
387	29.0	468	30.0	549	9.9
388	25.7	469	35.7	550	6.6
389	23.0	470	35.0	551	3.6

APPENDIX I—Continued

APPENDIX I—Continued

APPENDIX I—Continued

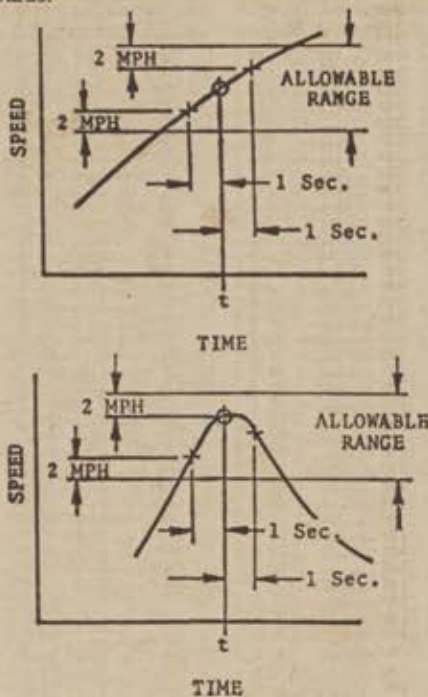
Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)		
552	0.0	629	0.0	706	18.2	783	28.9	860	29.0	937	24.3	1,014	22.0	1,091	8.0	1,168	0.0
553	0.0	630	0.0	707	19.2	784	28.9	861	29.1	938	24.5	1,015	21.6	1,092	8.7	1,169	2.1
554	0.0	631	0.0	708	20.1	785	28.9	862	29.0	939	25.0	1,016	20.5	1,093	8.6	1,170	8.4
555	0.0	632	0.0	709	21.5	786	28.8	863	28.1	940	25.0	1,017	17.5	1,094	8.0	1,171	8.7
556	0.0	633	0.0	710	22.5	787	28.5	864	27.5	941	24.6	1,018	14.2	1,095	7.0	1,172	12.0
557	0.0	634	0.0	711	22.5	788	28.3	865	27.0	942	24.6	1,019	10.9	1,096	8.0	1,173	15.3
558	0.0	635	0.0	712	22.1	789	28.3	866	25.8	943	24.1	1,020	7.6	1,097	4.2	1,174	18.6
559	0.0	636	0.0	713	22.7	790	28.3	867	25.0	944	24.5	1,021	4.3	1,098	2.6	1,175	21.1
560	0.0	637	0.0	714	23.3	791	28.2	868	24.5	945	25.1	1,022	1.0	1,099	1.0	1,176	23.0
561	0.0	638	0.0	715	23.3	792	27.6	869	24.8	946	25.6	1,023	0.0	1,100	0.0	1,177	23.5
562	0.0	639	0.0	716	22.8	793	27.5	870	25.1	947	25.1	1,024	0.0	1,101	0.1	1,178	23.0
563	0.0	640	0.0	717	21.6	794	27.5	871	25.5	948	24.0	1,025	0.0	1,102	0.6	1,179	22.8
564	0.0	641	0.0	718	20.5	795	27.5	872	25.7	949	22.0	1,026	0.0	1,103	1.6	1,180	20.0
565	0.0	642	0.0	719	18.0	796	27.6	873	26.2	950	20.1	1,027	0.0	1,104	3.6	1,181	16.7
566	0.0	643	0.0	720	15.0	797	27.5	874	26.9	951	16.9	1,028	0.0	1,105	6.9	1,182	13.4
567	0.0	644	0.0	721	12.0	798	27.5	875	27.5	952	13.8	1,029	0.0	1,106	10.0	1,183	10.1
568	0.0	645	0.0	722	9.0	799	27.6	876	27.5	953	10.3	1,030	0.0	1,107	12.8	1,184	6.8
569	3.3	646	2.0	723	6.2	800	28.0	877	28.4	954	7.0	1,031	0.0	1,108	14.0	1,185	3.5
570	6.6	647	4.5	724	4.3	801	28.5	878	29.0	955	3.7	1,032	0.0	1,109	14.5	1,186	0.2
571	9.9	648	7.8	725	3.0	802	30.0	879	29.2	956	0.4	1,033	0.0	1,110	16.0	1,187	0.0
572	13.2	649	10.2	726	2.1	803	31.0	880	29.1	957	0.0	1,034	0.0	1,111	18.1	1,188	0.0
573	16.5	650	12.5	727	0.8	804	32.0	881	29.0	958	0.0	1,035	0.0	1,112	20.0	1,189	0.0
574	19.8	651	14.0	728	0.5	805	33.0	882	28.9	959	0.0	1,036	0.0	1,113	21.0	1,190	0.0
575	23.1	652	15.3	729	3.2	806	33.0	883	28.5	960	2.0	1,037	0.0	1,114	21.2	1,191	0.0
576	26.4	653	17.5	730	6.4	807	33.6	884	28.1	961	5.0	1,038	0.0	1,115	21.3	1,192	0.0
577	29.7	654	19.6	731	9.6	808	34.0	885	28.0	962	8.6	1,039	0.0	1,116	21.4	1,193	0.0
578	33.0	655	21.0	732	12.5	809	34.3	886	28.0	963	11.9	1,040	0.0	1,117	21.7	1,194	0.0
579	36.3	656	22.2	733	14.0	810	34.2	887	27.6	964	15.2	1,041	0.0	1,118	22.5	1,195	0.0
580	39.6	657	23.3	734	16.0	811	34.0	888	27.2	965	17.5	1,042	0.0	1,119	23.0	1,196	0.0
581	42.9	658	24.6	735	18.0	812	34.0	889	26.6	966	18.6	1,043	0.0	1,120	23.8	1,197	0.2
582	46.2	659	25.8	736	19.6	813	33.9	890	27.0	967	20.0	1,044	0.0	1,121	24.5	1,198	1.5
583	49.5	660	26.6	737	21.5	814	33.6	891	27.5	968	21.1	1,045	0.0	1,122	25.0	1,199	3.5
584	52.8	661	28.0	738	23.1	815	33.1	892	27.8	969	22.0	1,046	0.0	1,123	24.9	1,200	6.5
585	56.1	662	29.1	739	24.6	816	33.0	893	28.0	970	23.0	1,047	0.0	1,124	24.8	1,201	9.8
586	59.4	663	29.2	740	26.5	817	32.5	894	27.8	971	24.5	1,048	0.0	1,125	25.0	1,202	12.0
587	62.7	664	29.2	741	28.5	818	32.0	895	28.0	972	26.3	1,049	0.0	1,126	25.4	1,203	12.9
588	66.0	665	29.4	742	27.1	819	31.9	896	28.0	973	27.5	1,050	0.0	1,127	25.8	1,204	13.0
589	69.3	666	29.5	743	27.6	820	31.6	897	28.0	974	28.1	1,051	0.0	1,128	26.0	1,205	12.6
590	72.6	667	29.6	744	27.9	821	31.5	898	27.7	975	28.4	1,052	0.0	1,129	26.4	1,206	12.8
591	75.9	668	29.0	745	28.3	822	30.6	899	27.4	976	28.5	1,053	1.2	1,130	26.5	1,207	13.1
592	79.2	669	25.5	746	28.6	823	30.0	900	26.9	977	28.5	1,054	4.0	1,131	26.9	1,208	13.1
593	82.5	670	23.6	747	28.6	824	29.9	901	26.6	978	28.5	1,055	7.3	1,132	27.0	1,209	14.0
594	85.8	671	21.4	748	28.3	825	29.9	902	26.5	979	27.7	1,056	10.6	1,133	27.0	1,210	15.5
595	89.1	672	18.8	749	28.2	826	29.9	903	26.5	980	27.8	1,057	13.9	1,134	27.0	1,211	17.0
596	92.4	673	16.4	750	28.0	827	29.9	904	26.5	981	27.2	1,058	17.6	1,135	26.9	1,212	18.6
597	95.7	674	14.2	751	27.5	828	29.6	905	26.2	982	26.8	1,059	18.5	1,136	26.8	1,213	19.7
598	99.0	675	11.6	752	26.8	829	29.5	906	26.2	983	26.6	1,060	20.0	1,137	26.8	1,214	21.0
599	102.3	676	9.7	753	25.5	830	29.5	907	26.2	984	26.0	1,061	21.8	1,138	26.5	1,215	21.5
600	105.6	677	8.8	754	23.8	831	29.3	908	25.9	985	25.7	1,062	23.0	1,139	26.4	1,216	21.8
601	108.9	678	3.5	755	21.5	832	28.9	909	25.6	986	25.2	1,063	24.0	1,140	26.0	1,217	21.8
602	112.2	679	2.0	756	19.0	833	28.2	910	25.6	987	24.0	1,064	24.8	1,141	25.5	1,218	21.5
603	115.5	680	0.0	757	16.5	834	27.7	911	25.9	988	22.8	1,065	25.6	1,142	24.6	1,219	21.2
604	118.8	681	0.0	758	14.9	835	27.0	912	25.5	989	21.5	1,066	26.8	1,143	23.5	1,220	21.5
605	122.1	682	0.0	759	12.5	836	25.5	913	25.5	990	20.5	1,067	28.0	1,144	21.5	1,221	21.8
606	125.4	683	0.0	760	9.4	837	23.7	914	24.6	991	21.5	1,068	27.4	1,145	20.0	1,222	22.0
607	128.7	684	0.0	761	6.2	838	22.0	915	23.6	992	22.5	1,069	27.9	1,146	17.5	1,223	21.9
608	132.0	685	0.0	762	3.0	839	20.5	916	22.2	993	23.0	1,070	28.3	1,147	16.0	1,224	21.7
609	135.3	686	0.0	763	1.5	840	19.2	917	21.6	994	22.8	1,071	28.0	1,148	14.0	1,225	21.5
610	138.6	687	0.0	764	1.5	841	19.2	918	21.6	995	22.8	1,072	27.5	1,149	10.7	1,226	21.5
611	141.9	688	0.0	765	0.8	842	20.1	919	21.7	996	23.0	1,073	27.0	1,150	7.4	1,227	21.4
612	145.2	689	0.0	766	3.0	843	20.9	920	22.6	997	22.7	1,074	27.0	1,151	4.1	1,228	20.1
613	148.5	690	0.0	767	0.0	844	21.4	921	22.4	998	22.7	1,075	26.3	1,152	0.8	1,229	19.5
614	151.8	691	0.0	768	0.3	845	22.0	922	24.0	999	22.7	1,076	24.8	1,153	0.0	1,230	19.2
615	155.1	692	0.0	769	0.6	846	22.6	923	24.2	1,000	23.6	1,077	23.5	1,154	0.0	1,231	19.6
616	158.4	693	0.0	770	12.9	847	23.2	924	24.4	1,001	24.9	1,078	21.5	1,155	0.0	1,232	19.8
617	161.7	694	1.4	771	15.8	848	24.0	925	24.9	1,002	24.6	1,079	20.0	1,156	0.0	1,233	20.0
618	165.0	695	3.3	772	17.8	849	25.0	926	25.1	1,003	24.8	1,080	18.0	1,157	0.0	1,234	19.5
619	168.3	696	4.4	773	18.4	850	26.0	927	25.2	1,004	25.1	1,081	15.0	1,158	0.0	1,235	17.5
620	171.6	697	6.5	774	19.5	851	26.6	928	25.3	1,005	25.5	1,082	12.3	1,159	0.0	1,236	18.5
621	174.9	698	9.2	775	20.7	852	26.6	929	25.5	1,006	25.6	1,083	11.1	1,160	0.0	1,237	18.0
622	178.2	699	11.3	776	22.0	853	26.8	930	25.2	1,007	25.8	1,084	10.6	1,161	0.0	1,238	19.0
623	181.5	700	13.5	777	23.2	854	27.0	931	25.0	1,008	25.9	1,085	10.0	1,162	0.0	1,239	8.0
624	184.8	701	14.6	778	25.0	855	27.2	932	25.0	1,009	24.1	1,086	9.6	1,163	0.0	1,240	6.0
625	188.1	702	16.4	779	26.5	856	27.8	933	25.0	1,010	23.7						

APPENDIX I—Continued

Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)	Time (sec.)	Speed (m.p.h.)
1,245	0.0	1,286	24.0	1,330	0.0
1,246	0.0	1,286	24.1	1,331	0.0
1,247	0.0	1,290	24.5	1,332	0.0
1,248	0.0	1,291	24.7	1,333	0.0
1,249	0.0	1,292	25.0	1,334	0.0
1,250	0.0	1,293	25.4	1,335	0.0
1,251	0.0	1,294	25.6	1,336	0.0
1,252	1.0	1,295	25.7	1,337	0.0
1,253	1.0	1,296	26.0	1,338	1.5
1,254	1.0	1,297	26.2	1,339	4.8
1,255	1.0	1,298	27.0	1,340	8.1
1,256	1.0	1,299	28.8	1,341	11.1
1,257	1.6	1,300	27.3	1,342	13.4
1,258	3.0	1,301	29.0	1,343	15.2
1,259	4.0	1,302	29.1	1,344	16.1
1,260	5.0	1,303	29.0	1,345	18.8
1,261	6.3	1,304	28.0	1,346	19.3
1,262	8.0	1,305	24.7	1,347	20.5
1,263	10.0	1,306	21.4	1,348	21.3
1,264	10.5	1,307	18.1	1,349	21.3
1,265	9.5	1,308	14.8	1,350	22.9
1,266	8.5	1,309	11.5	1,351	22.4
1,267	7.6	1,310	8.2	1,352	22.0
1,268	8.8	1,311	4.9	1,353	21.6
1,269	11.0	1,312	1.6	1,354	21.1
1,270	14.0	1,313	0.0	1,355	20.5
1,271	17.0	1,314	0.0	1,356	20.0
1,272	19.5	1,315	0.0	1,357	19.6
1,273	21.0	1,316	0.0	1,358	18.5
1,274	21.8	1,317	0.0	1,359	17.5
1,275	22.2	1,318	0.0	1,360	16.5
1,276	23.0	1,319	0.0	1,361	15.8
1,277	23.6	1,320	0.0	1,362	14.0
1,278	24.1	1,321	0.0	1,363	11.0
1,279	24.5	1,322	0.0	1,364	8.0
1,280	24.5	1,323	0.0	1,365	5.2
1,281	24.0	1,324	0.0	1,366	2.8
1,282	23.5	1,325	0.0	1,367	0.0
1,283	23.5	1,326	0.0	1,368	0.0
1,284	23.5	1,327	0.0	1,369	0.0
1,285	23.5	1,328	0.0	1,370	0.0
1,286	23.5	1,329	0.0	1,371	0.0
1,287	23.5				

The diagrams below show the range of acceptable speed tolerances for typical points. The curve on the left is typical of portions of the speed curve which are increasing or decreasing throughout the 2

second time interval. The curve on the right is typical of portions of the speed curve which include a maximum or minimum value.



(b) EPA Urban Dynamometer Driving Schedule for Light-Duty Vehicles, Light-Duty Trucks, and Motorcycles with engine displacements equal to or greater than 170 cc (10.4 cu. in.).

Speed Versus Time Sequence

Speed (kilometres per hour)	Time (seconds)	Speed (kilometres per hour)	Time (seconds)	Speed (kilometres per hour)	Time (seconds)	Speed (kilometres per hour)	Time (seconds)
0	0	37	31.9	74	40.9	111	51.2
1	0	38	27.4	75	40.1	112	51.8
2	0	39	24.0	76	40.2	113	52.1
3	0	40	24.0	77	40.9	114	51.8
4	0	41	24.5	78	41.8	115	51.0
5	0	42	24.9	79	41.8	116	46.0
6	0	43	25.7	80	41.4	117	40.7
7	0	44	27.5	81	42.0	118	35.4
8	0	45	30.7	82	43.0	119	30.1
9	0	46	34.0	83	44.3	120	24.8
10	0	47	36.5	84	46.0	121	19.5
11	0	48	35.9	85	47.2	122	14.2
12	0	49	36.5	86	48.0	123	8.9
13	0	50	36.4	87	48.4	124	3.5
14	0	51	34.3	88	48.9	125	0
15	0	52	30.6	89	49.4	126	0
16	0	53	27.5	90	49.4	127	0
17	0	54	25.4	91	49.1	128	0
18	0	55	25.4	92	48.9	129	0
19	0	56	28.5	93	48.8	130	0
20	0	57	31.9	94	48.9	131	0
21	4.8	58	34.8	95	49.6	132	0
22	9.5	59	37.3	96	48.9	133	0
23	13.8	60	38.9	97	48.1	134	0
24	18.5	61	39.6	98	47.5	135	0
25	23.0	62	40.1	99	48.0	136	0
26	27.2	63	40.2	100	48.8	137	0
27	27.6	64	39.6	101	49.4	138	0
28	29.1	65	39.4	102	49.7	139	0
29	33.3	66	39.8	103	49.9	140	0
30	34.0	67	39.9	104	49.7	141	0
31	36.0	68	39.8	105	48.9	142	0
32	36.2	69	39.6	106	48.0	143	0
33	35.0	70	39.6	107	48.1	144	0
34	34.0	71	40.4	108	48.6	145	0
35	33.6	72	41.2	109	49.4	146	0
36	32.8	73	41.4	110	50.2	147	0

RULES AND REGULATIONS

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Time	Speed (kilometres per (second): hour)	Time	Speed (kilometres per (second): hour)	Time	Speed (kilometres per (second): hour)	Time	Speed (kilometres per (second): hour)
148	0	234	88.7	320	44.3	406	20.1
149	0	235	89.3	321	39.9	407	25.4
150	0	236	89.6	322	34.6	408	30.7
151	0	237	90.3	323	32.3	409	36.0
152	0	238	90.8	324	30.7	410	40.2
153	0	239	91.1	325	29.8	411	41.2
154	0	240	91.3	326	27.4	412	44.3
155	0	241	91.2	327	24.9	413	46.7
156	0	242	90.9	328	20.1	414	48.3
157	0	243	90.0	329	17.4	415	48.4
158	0	244	90.9	330	12.9	416	48.3
159	0	245	90.9	331	7.6	417	47.8
160	0	246	90.9	332	2.3	418	47.2
161	0	247	90.9	333	0	419	46.3
162	0	248	90.8	334	0	420	45.1
163	0	249	90.3	335	0	421	40.3
164	5.3	250	89.8	336	0	422	34.9
165	10.6	251	88.7	337	0	423	29.6
166	16.9	252	87.9	338	0	424	24.3
167	21.2	253	87.2	339	0	425	19.0
168	26.6	254	86.9	340	0	426	13.7
169	31.9	255	86.4	341	0	427	8.4
170	36.7	256	86.3	342	0	428	3.1
171	39.1	257	86.7	343	0	429	0
172	41.6	258	88.0	344	0	430	0
173	42.5	259	87.1	345	0	431	0
174	41.4	260	87.1	346	0	432	0
175	40.4	261	86.6	347	1.6	433	0
176	39.8	262	85.9	348	6.9	434	0
177	40.2	263	85.3	349	12.2	435	0
178	40.6	264	84.7	350	17.5	436	0
179	40.9	265	83.8	351	22.8	437	0
180	41.5	266	84.3	352	27.8	438	0
181	43.8	267	83.7	353	32.2	439	0
182	42.6	268	83.5	354	36.2	440	0
183	38.6	269	83.2	355	38.1	441	0
184	36.5	270	82.9	356	40.6	442	0
185	51.2	271	83.0	357	42.8	443	0
186	28.5	272	83.4	358	45.2	444	0
187	27.7	273	83.8	359	48.3	445	0
188	29.1	274	84.5	360	49.6	446	0
189	29.9	275	85.3	361	50.0	447	0
190	32.2	276	86.1	362	51.7	448	5.3
191	35.7	277	86.9	363	52.8	449	10.6
192	39.4	278	88.4	364	54.1	450	16.9
193	43.9	279	89.2	365	55.5	451	21.2
194	49.1	280	89.5	366	55.7	452	26.6
195	53.9	281	90.1	367	56.2	453	31.9
196	58.3	282	90.1	368	56.0	454	37.2
197	60.0	283	89.8	369	55.5	455	42.5
198	63.2	284	88.8	370	55.8	456	44.7
199	65.2	285	87.7	371	57.1	457	46.8
200	67.8	286	86.3	372	57.9	458	50.7
201	70.0	287	84.5	373	57.9	459	53.1
202	72.6	288	82.0	374	57.9	460	54.1
203	74.0	289	82.0	375	57.9	461	56.0
204	75.3	290	82.9	376	57.9	462	56.5
205	76.4	291	82.2	377	57.9	463	57.3
206	76.4	292	80.6	378	58.1	464	58.1
207	76.1	293	80.5	379	58.0	465	57.9
208	76.0	294	80.6	380	58.7	466	58.1
209	75.8	295	80.5	381	58.6	467	58.3
210	75.6	296	79.8	382	57.9	468	57.9
211	75.6	297	79.7	383	56.5	469	57.5
212	75.6	298	79.7	384	54.9	470	57.9
213	76.6	299	79.7	385	53.9	471	57.9
214	78.0	300	79.0	386	50.5	472	57.3
215	76.3	301	78.2	387	46.7	473	57.1
216	77.1	302	77.4	388	41.4	474	57.0
217	78.1	303	76.0	389	37.0	475	56.6
218	79.0	304	74.2	390	32.7	476	56.6
219	79.7	305	73.4	391	28.2	477	56.6
220	80.5	306	70.5	392	23.3	478	56.6
221	81.4	307	66.6	393	19.3	479	56.6
222	82.1	308	65.8	394	14.0	480	56.6
223	82.9	309	64.9	395	8.7	481	56.3
224	84.0	310	63.0	396	3.4	482	56.5
225	85.6	311	59.5	397	0	483	56.6
226	87.1	312	56.6	398	0	484	57.1
227	87.9	313	54.4	399	0	485	56.6
228	88.4	314	52.3	400	0	486	56.3
229	88.5	315	50.7	401	0	487	56.3
230	88.4	316	49.2	402	0	488	56.3
231	87.9	317	49.1	403	4.3	489	60.0
232	87.9	318	48.3	404	9.5	490	55.7
233	88.2	319	46.7	405	14.9		

RULES AND REGULATIONS

Time (sec- onds)	Speed (kilometres per hour)
481	58.8
482	59.0
483	59.2
484	59.4
485	59.6
486	59.8
487	60.0
488	60.2
489	60.4
490	60.6
491	60.8
492	61.0
493	61.2
494	61.4
495	61.6
496	61.8
497	62.0
498	62.2
499	62.4
500	62.6
501	62.8
502	63.0
503	63.2
504	63.4
505	63.6
506	63.8
507	64.0
508	64.2
509	64.4
510	64.6
511	64.8
512	65.0
513	65.2
514	65.4
515	65.6
516	65.8
517	66.0
518	66.2
519	66.4
520	66.6
521	66.8
522	67.0
523	67.2
524	67.4
525	67.6
526	67.8
527	68.0
528	68.2
529	68.4
530	68.6
531	68.8
532	69.0
533	69.2
534	69.4
535	69.6
536	69.8
537	70.0
538	70.2
539	70.4
540	70.6
541	70.8
542	71.0
543	71.2
544	71.4
545	71.6
546	71.8
547	72.0
548	72.2
549	72.4
550	72.6
551	72.8
552	73.0
553	73.2
554	73.4
555	73.6
556	73.8
557	74.0
558	74.2
559	74.4
560	74.6
561	74.8
562	75.0
563	75.2
564	75.4
565	75.6
566	75.8
567	76.0
568	76.2
569	76.4
570	76.6
571	76.8
572	77.0
573	77.2
574	77.4
575	77.6
576	77.8
577	78.0

Time (sec- onds)	Speed (kilometres per hour)
611	71.4
612	71.6
613	71.8
614	72.0
615	72.2
616	72.4
617	72.6
618	72.8
619	73.0
620	73.2
621	73.4
622	73.6
623	73.8
624	74.0
625	74.2
626	74.4
627	74.6
628	74.8
629	75.0
630	75.2
631	75.4
632	75.6
633	75.8
634	76.0
635	76.2
636	76.4
637	76.6
638	76.8
639	77.0
640	77.2
641	77.4
642	77.6
643	77.8
644	78.0
645	78.2
646	78.4
647	78.6
648	78.8
649	79.0
650	79.2
651	79.4
652	79.6
653	79.8
654	80.0
655	80.2
656	80.4
657	80.6
658	80.8
659	81.0
660	81.2
661	81.4
662	81.6

Time (sec- onds)	Speed (kilometres per hour)
683	82.3
684	82.5
685	82.7
686	82.9
687	83.1
688	83.3
689	83.5
690	83.7
691	83.9
692	84.1
693	84.3
694	84.5
695	84.7
696	84.9
697	85.1
698	85.3
699	85.5
700	85.7
701	85.9
702	86.1
703	86.3
704	86.5
705	86.7
706	86.9
707	87.1
708	87.3
709	87.5
710	87.7
711	87.9
712	88.1
713	88.3
714	88.5
715	88.7
716	88.9
717	89.1
718	89.3
719	89.5
720	89.7
721	89.9
722	90.1
723	90.3
724	90.5
725	90.7
726	90.9
727	91.1
728	91.3
729	91.5
730	91.7
731	91.9
732	92.1
733	92.3
734	92.5
735	92.7
736	92.9
737	93.1
738	93.3
739	93.5
740	93.7
741	93.9
742	94.1
743	94.3
744	94.5
745	94.7
746	94.9

Time (sec- onds)	Speed (kilometres per hour)
717	86.0
718	86.2
719	86.4
720	86.6
721	86.8
722	87.0
723	87.2
724	87.4
725	87.6
726	87.8
727	88.0
728	88.2
729	88.4
730	88.6
731	88.8
732	89.0
733	89.2
734	89.4
735	89.6
736	89.8
737	90.0
738	90.2
739	90.4
740	90.6
741	90.8
742	91.0
743	91.2
744	91.4
745	91.6
746	91.8
747	92.0
748	92.2
749	92.4
750	92.6
751	92.8
752	93.0
753	93.2
754	93.4
755	93.6
756	93.8
757	94.0
758	94.2
759	94.4
760	94.6
761	94.8
762	95.0
763	95.2
764	95.4
765	95.6
766	95.8
767	96.0
768	96.2
769	96.4
770	96.6
771	96.8
772	97.0
773	97.2
774	97.4
775	97.6
776	97.8
777	98.0
778	98.2
779	98.4
780	98.6
781	98.8
782	99.0
783	99.2
784	99.4
785	99.6
786	99.8
787	100.0
788	100.2
789	100.4
790	100.6
791	100.8
792	101.0
793	101.2
794	101.4
795	101.6
796	101.8
797	102.0
798	102.2
799	102.4
800	102.6
801	102.8
802	103.0
803	103.2
804	103.4
805	103.6
806	103.8
807	104.0
808	104.2
809	104.4
810	104.6
811	104.8
812	105.0
813	105.2
814	105.4
815	105.6
816	105.8
817	106.0
818	106.2
819	106.4
820	106.6
821	106.8
822	107.0
823	107.2
824	107.4
825	107.6
826	107.8
827	108.0
828	108.2
829	108.4
830	108.6
831	108.8

RULES AND REGULATIONS

Time (sec- onds):	Speed (kilometres per hour)	Time (sec- onds):	Speed (kilometres per hour)	Time (sec- onds):	Speed (kilometres per hour)	Time (sec- onds):	Speed (kilometres per hour)
832	46.5	920	36.4	1,007	41.0	1,095	11.8
833	45.4	921	37.7	1,008	40.2	1,096	8.0
834	44.8	922	38.6	1,009	39.6	1,097	6.0
835	43.5	923	39.9	1,010	38.1	1,098	4.2
836	41.0	924	39.3	1,011	37.3	1,099	1.6
837	38.1	925	40.1	1,012	36.9	1,100	0
838	35.4	926	40.4	1,013	36.2	1,101	0.2
839	33.0	927	40.0	1,014	35.4	1,102	1.0
840	30.9	928	40.7	1,015	34.8	1,103	2.0
841	30.0	929	41.0	1,016	33.0	1,104	5.8
842	32.7	930	40.5	1,017	28.2	1,105	11.1
843	33.0	931	40.2	1,018	22.0	1,106	16.1
844	34.4	932	40.3	1,019	17.5	1,107	20.6
845	35.4	933	40.2	1,020	12.2	1,108	22.5
846	36.4	934	39.8	1,021	6.0	1,109	23.3
847	37.3	935	39.4	1,022	1.0	1,110	25.7
848	38.0	936	39.1	1,023	0	1,111	29.1
849	40.2	937	39.1	1,024	0	1,112	32.2
850	41.8	938	38.4	1,025	0	1,113	33.8
851	42.8	939	40.2	1,026	0	1,114	34.1
852	42.0	940	40.3	1,027	0	1,115	34.8
853	43.1	941	39.6	1,028	0	1,116	34.4
854	43.0	942	39.6	1,029	0	1,117	34.0
855	43.8	943	38.8	1,030	0	1,118	30.2
856	44.7	944	38.4	1,031	0	1,119	37.0
857	45.2	945	40.4	1,032	0	1,120	36.3
858	46.3	946	41.2	1,033	0	1,121	39.4
859	46.5	947	40.4	1,034	0	1,122	40.2
860	46.7	948	38.0	1,035	0	1,123	40.1
861	46.8	949	35.4	1,036	0	1,124	39.0
862	46.7	950	32.3	1,037	0	1,125	40.2
863	45.2	951	27.2	1,038	0	1,126	40.0
864	44.3	952	21.9	1,039	0	1,127	41.5
865	43.6	953	16.0	1,040	0	1,128	41.8
866	41.9	954	11.9	1,041	0	1,129	42.5
867	40.2	955	6.0	1,042	0	1,130	42.6
868	39.4	956	0.6	1,043	0	1,131	43.3
869	39.9	957	0	1,044	0	1,132	43.8
870	40.4	958	0	1,045	0	1,133	43.5
871	41.0	959	0	1,046	0	1,134	43.5
872	41.4	960	2.2	1,047	0	1,135	43.3
873	42.2	961	8.5	1,048	0	1,136	42.1
874	43.3	962	13.8	1,049	0	1,137	43.1
875	44.3	963	19.2	1,050	0	1,138	42.6
876	44.7	964	24.5	1,051	0	1,139	42.5
877	45.7	965	28.2	1,052	0	1,140	41.8
878	46.7	966	29.9	1,053	1.0	1,141	41.0
879	47.0	967	32.2	1,054	6.4	1,142	39.5
880	46.8	968	34.0	1,055	11.7	1,143	37.8
881	46.7	969	35.4	1,056	17.1	1,144	34.0
882	46.5	970	37.0	1,057	22.4	1,145	32.2
883	45.0	971	39.4	1,058	27.4	1,146	28.2
884	45.2	972	42.3	1,059	29.8	1,147	25.7
885	45.1	973	44.3	1,060	32.2	1,148	22.5
886	45.1	974	45.2	1,061	35.1	1,149	17.2
887	44.4	975	45.7	1,062	37.0	1,150	11.0
888	43.5	976	45.9	1,063	38.0	1,151	6.0
889	42.8	977	45.0	1,064	39.0	1,152	1.8
890	43.5	978	45.0	1,065	41.2	1,153	0
891	44.3	979	44.6	1,066	42.6	1,154	0
892	44.7	980	44.3	1,067	43.1	1,155	0
893	45.1	981	43.8	1,068	44.1	1,156	0
894	44.7	982	43.1	1,069	44.9	1,157	0
895	45.1	983	42.6	1,070	45.5	1,158	0
896	45.1	984	41.8	1,071	45.1	1,159	0
897	45.1	985	41.4	1,072	44.3	1,160	0
898	44.6	986	40.6	1,073	43.5	1,161	0
899	44.1	987	39.6	1,074	43.5	1,162	0
900	43.3	988	35.4	1,075	42.3	1,163	0
901	42.8	989	34.0	1,076	39.4	1,164	0
902	42.0	990	34.0	1,077	36.2	1,165	0
903	42.0	991	35.1	1,078	34.6	1,166	0
904	42.0	992	36.2	1,079	33.2	1,167	0
905	42.3	993	37.0	1,080	29.0	1,168	0
906	42.3	994	36.7	1,081	24.1	1,169	3.4
907	42.2	995	36.7	1,082	19.8	1,170	8.7
908	41.7	996	36.7	1,083	17.0	1,171	14.0
909	41.2	997	37.0	1,084	12.1	1,172	19.3
910	41.2	998	36.5	1,085	10.1	1,173	24.0
911	41.7	999	36.5	1,086	15.3	1,174	29.9
912	41.5	1,000	37.8	1,087	14.8	1,175	34.0
913	41.0	1,001	38.0	1,088	14.0	1,176	37.0
914	39.0	1,002	39.0	1,089	13.8	1,177	37.8
915	37.8	1,003	39.0	1,090	14.2	1,178	37.0
916	35.7	1,004	39.0	1,091	14.5	1,179	36.2
917	34.5	1,005	40.4	1,092	14.0	1,180	32.2
918	34.8	1,006	41.0	1,093	13.8	1,181	26.9
919	34.0	1,007	41.2	1,094	12.9	1,182	21.8

RULES AND REGULATIONS

Time (seconds): hour	Speed (kilometres per hour)	Time (seconds): hour	Speed (kilometres per hour)	Time (seconds): hour	Speed (kilometres per hour)	Time (seconds): hour	Speed (kilometres per hour)
1.183	18.3	1.231	31.5	1.279	30.4	1.327	0
1.184	10.9	1.232	31.9	1.280	30.4	1.328	0
1.185	6.0	1.233	32.2	1.281	38.0	1.329	0
1.186	0.3	1.234	31.4	1.282	37.8	1.330	0
1.187	0	1.235	28.2	1.283	37.8	1.331	0
1.188	0	1.236	24.9	1.284	37.8	1.332	0
1.189	0	1.237	30.0	1.285	37.8	1.333	0
1.190	0	1.238	19.1	1.286	37.8	1.334	0
1.191	0	1.239	12.9	1.287	37.8	1.335	0
1.192	0	1.240	9.7	1.288	38.0	1.336	0
1.193	0	1.241	6.4	1.289	38.0	1.337	0
1.194	0	1.242	4.0	1.290	39.4	1.338	2.4
1.195	0	1.243	1.1	1.291	39.8	1.339	7.7
1.196	0	1.244	0	1.292	40.2	1.340	13.0
1.197	0.3	1.245	0	1.293	40.2	1.341	18.3
1.198	2.4	1.246	0	1.294	41.2	1.342	21.2
1.199	5.0	1.247	0	1.295	41.4	1.343	24.3
1.200	10.5	1.248	0	1.296	41.0	1.344	27.0
1.201	15.8	1.249	0	1.297	41.2	1.345	29.5
1.202	19.3	1.250	0	1.298	43.6	1.346	31.4
1.203	20.8	1.251	0	1.299	44.7	1.347	32.7
1.204	20.9	1.252	1.6	1.300	45.5	1.348	34.3
1.205	20.3	1.253	1.8	1.301	46.7	1.349	35.2
1.206	20.6	1.254	1.6	1.302	46.8	1.350	38.0
1.207	21.1	1.255	1.6	1.303	46.7	1.351	38.0
1.208	21.1	1.256	1.0	1.304	45.1	1.352	38.4
1.209	22.5	1.257	2.6	1.305	30.8	1.353	34.0
1.210	24.9	1.258	4.8	1.306	34.4	1.354	33.0
1.211	27.4	1.259	6.4	1.307	29.1	1.355	32.2
1.212	29.9	1.260	8.0	1.308	23.8	1.356	31.5
1.213	31.7	1.261	10.1	1.309	18.5	1.357	29.8
1.214	33.8	1.262	12.9	1.310	13.2	1.358	28.2
1.215	34.0	1.263	16.1	1.311	7.9	1.359	26.6
1.216	35.1	1.264	18.9	1.312	2.8	1.361	24.9
1.217	35.1	1.265	15.3	1.313	0	1.362	23.5
1.218	34.6	1.266	13.7	1.314	0	1.363	17.7
1.219	34.1	1.267	12.2	1.315	0	1.364	12.0
1.220	34.0	1.268	14.2	1.316	0	1.365	8.4
1.221	35.1	1.269	17.7	1.317	0	1.366	4.0
1.222	35.1	1.270	23.5	1.318	0	1.367	0
1.223	35.3	1.271	27.4	1.319	0	1.368	0
1.224	34.9	1.272	31.4	1.320	0	1.369	0
1.225	34.6	1.273	33.0	1.321	0	1.370	0
1.226	34.6	1.274	35.1	1.322	0	1.371	0
1.227	34.1	1.275	35.7	1.323	0		
1.228	32.3	1.276	37.0	1.324	0		
1.229	31.4	1.277	38.0	1.325	0		
1.230	30.9	1.278	38.8	1.326	0		

(c) EPA Urban Dynamometer Driving Schedule for motorcycles with engine displacements less than 170 cc (10.4 cu. in.).

Speed Versus Time Sequence

Time (seconds): hour	Speed (kilometres per hour)	Time (seconds): hour	Speed (kilometres per hour)	Time (seconds): hour	Speed (kilometres per hour)	Time (seconds): hour	Speed (kilometres per hour)
1	0	14	0	27	27.8	40	24.0
2	0	15	0	28	29.1	41	24.6
3	0	16	0	29	33.2	42	24.9
4	0	17	0	30	34.9	43	25.7
5	0	18	0	31	36.0	44	27.5
6	0	19	0	32	36.2	45	30.7
7	0	20	0	33	35.6	46	34.0
8	0	21	4.8	34	34.6	47	36.6
9	0	22	9.6	35	33.6	48	38.9
10	0	23	13.8	36	32.8	49	36.5
11	0	24	18.6	37	31.9	50	36.4
12	0	25	23.0	38	27.4	51	34.3
13	0	26	27.2	39	24.0	52	20.6

RULES AND REGULATIONS

Time (seconds):	Speed (kilometres per hour)	Time (seconds):	Speed (kilometres per hour)	Time (seconds):	Speed (kilometres per hour)	Time (seconds):	Speed (kilometres per hour)
53	27.5	137	0	321	52.4	305	46.6
54	25.4	138	0	322	52.8	306	45.4
55	25.4	139	0	323	53.4	307	44.1
56	28.5	140	0	324	54.1	308	43.0
57	31.9	141	0	325	55.1	309	41.8
58	34.8	142	0	326	56.0	310	39.9
59	37.3	143	0	327	56.6	311	38.3
60	36.9	144	0	328	56.9	312	36.5
61	26.4	145	0	329	57.0	313	35.0
62	40.1	146	0	330	56.9	314	33.7
63	40.2	147	0	331	56.6	315	32.6
64	39.6	148	0	332	56.6	316	31.7
65	39.4	149	0	333	56.8	317	31.6
66	39.8	150	0	334	57.1	318	31.1
67	39.9	151	0	335	57.5	319	30.0
68	39.6	152	0	336	57.7	320	28.5
69	39.6	153	0	337	58.1	321	25.7
70	39.6	154	0	338	58.3	322	23.3
71	40.4	155	0	339	58.6	323	20.8
72	41.2	156	0	340	58.7	324	19.8
73	41.4	157	0	341	58.7	325	19.2
74	40.9	158	0	342	58.5	326	17.6
75	40.1	159	0	343	58.5	327	16.1
76	40.2	160	0	344	58.5	328	12.9
77	40.9	161	0	345	58.5	329	11.2
78	41.8	162	0	346	58.5	330	8.3
79	41.6	163	0	347	58.6	331	4.9
80	41.4	164	3.4	348	58.4	332	1.5
81	43.0	165	6.8	349	58.1	333	0
82	43.0	166	10.3	350	57.8	334	0
83	44.3	167	13.7	351	57.1	335	0
84	45.0	168	17.1	352	56.6	336	0
85	47.2	169	20.5	353	56.2	337	0
86	48.0	170	23.0	354	55.9	338	0
87	48.4	171	25.3	355	55.6	339	0
88	46.9	172	26.7	356	55.6	340	0
89	49.4	173	27.4	357	55.8	341	0
90	49.4	174	26.6	358	55.9	342	0
91	49.1	175	26.0	359	56.0	343	0
92	48.9	176	25.6	360	56.0	344	0
93	48.8	177	25.9	361	55.7	345	0
94	48.9	178	26.1	362	55.3	346	0
95	49.0	179	26.3	363	54.9	347	1.6
96	46.9	180	26.7	364	54.5	348	6.0
97	48.1	181	28.3	365	54.0	349	12.2
98	47.5	182	27.5	366	54.3	350	17.6
99	48.0	183	24.9	367	53.9	351	22.9
100	46.8	184	23.5	368	53.8	352	27.8
101	49.4	185	20.1	369	53.6	353	32.3
102	49.7	186	18.3	370	53.4	354	36.2
103	49.9	187	17.8	371	53.5	355	38.1
104	49.7	188	18.6	372	53.7	356	40.6
105	48.9	189	19.3	373	54.0	357	42.8
106	48.0	190	20.7	374	54.4	358	45.2
107	48.1	191	23.0	375	54.9	359	46.3
108	48.6	192	25.4	376	55.4	360	49.6
109	49.4	193	28.3	377	55.9	361	50.9
110	50.3	194	31.6	378	56.9	362	51.7
111	51.2	195	34.7	379	57.4	363	53.8
112	51.8	196	37.5	380	57.6	364	54.1
113	52.1	197	38.6	381	58.0	365	55.5
114	51.8	198	40.7	382	58.0	366	55.7
115	51.0	199	42.0	383	57.8	367	56.2
116	46.0	200	43.6	384	57.3	368	56.0
117	49.7	201	45.1	385	56.5	369	55.5
118	35.4	202	46.7	386	55.5	370	55.6
119	30.1	203	47.7	387	54.4	371	57.1
120	24.8	204	48.5	388	53.4	372	57.9
121	19.5	205	49.2	389	53.4	373	57.9
122	14.2	206	49.2	390	53.4	374	57.9
123	8.9	207	49.0	391	53.9	375	57.9
124	3.5	208	48.9	392	51.9	376	57.9
125	0	209	48.7	393	51.8	377	57.9
126	0	210	48.7	394	51.9	378	58.1
127	0	211	48.7	395	51.8	379	58.6
128	0	212	48.7	396	51.4	380	58.7
129	0	213	48.7	397	51.3	381	58.6
130	0	214	48.9	398	51.2	382	57.9
131	0	215	49.1	399	51.3	383	56.5
132	0	216	49.6	400	50.9	384	54.9
133	0	217	50.3	401	50.3	385	53.9
134	0	218	50.9	402	49.8	386	52.5
135	0	219	51.3	403	48.9	387	46.7
136	0	220	51.8	404	47.8	388	41.6

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Speed (kilo- metres per Time (seconds): hour)		Speed (kilo- metres per Time (seconds): hour)		Speed (kilo- metres per Time (seconds): hour)		Speed (kilo- metres per Time (seconds): hour)	
389	37.0	473	87.1	657	0	641	0
390	32.7	474	87.0	658	0	642	0
391	28.2	475	86.8	659	0	643	0
392	23.3	476	86.6	660	0	644	0
393	19.3	477	86.6	661	0	645	0
394	14.0	478	86.6	662	0	646	3.2
395	8.7	479	86.6	663	0	647	7.2
396	3.4	480	86.6	664	0	648	12.6
397	0	481	86.6	665	0	649	16.4
398	0	482	86.6	666	0	650	20.1
399	0	483	86.6	667	0	651	22.6
400	0	484	87.1	668	0	652	24.6
401	0	485	86.6	669	5.3	653	28.2
402	0	486	86.3	670	10.6	654	31.5
403	4.2	487	86.3	671	15.9	655	33.8
404	9.6	488	86.3	672	20.9	656	35.7
405	14.8	489	86.3	673	23.6	657	37.5
406	20.1	490	85.7	674	25.7	658	39.4
407	25.4	491	85.5	675	27.4	659	40.7
408	30.7	492	85.9	676	27.4	660	41.3
409	36.0	493	81.5	677	27.4	661	41.8
410	40.2	494	48.4	678	28.2	662	42.0
411	41.2	495	46.1	679	28.5	663	42.2
412	44.3	496	41.0	680	28.5	664	42.2
413	46.7	497	36.2	681	28.2	665	42.5
414	48.3	498	31.9	682	27.4	666	42.6
415	46.4	499	28.6	683	27.2	667	42.6
416	46.3	500	21.2	684	25.7	668	41.8
417	47.8	501	16.6	685	27.4	669	41.0
418	47.2	502	11.6	686	27.5	670	38.0
419	46.3	503	6.4	687	27.4	671	34.4
420	45.1	504	1.6	688	26.7	672	29.8
421	40.2	505	0	689	26.6	673	26.4
422	34.9	506	0	690	26.6	674	23.3
423	29.6	507	0	691	26.7	675	18.7
424	24.3	508	0	692	27.4	676	14.0
425	19.0	509	0	693	28.3	677	9.3
426	13.7	510	0	694	29.8	678	5.6
427	8.4	511	1.9	695	30.9	679	3.2
428	3.1	512	5.8	696	32.5	680	0
429	0	513	8.9	697	33.8	681	0
430	0	514	10.5	698	34.0	682	0
431	0	515	13.7	699	34.1	683	0
432	0	516	15.4	700	34.8	684	0
433	0	517	16.9	701	35.4	685	0
434	0	518	19.2	702	36.0	686	0
435	0	519	22.5	703	36.2	687	0
436	0	520	25.7	704	36.2	688	0
437	0	521	28.5	705	36.2	689	0
438	0	522	30.6	706	36.5	690	0
439	0	523	32.3	707	38.1	691	0
440	0	524	33.8	708	40.4	692	0
441	0	525	35.4	709	41.8	693	0
442	0	526	37.0	710	42.6	694	3.3
443	0	527	38.3	711	43.5	695	5.3
444	0	528	39.4	712	42.0	696	7.1
445	0	529	40.1	713	38.7	697	10.5
446	0	530	40.2	714	31.4	698	14.8
447	0	531	40.2	715	26.1	699	18.3
448	5.8	532	40.2	716	20.8	700	21.7
449	10.6	533	40.2	717	15.4	701	23.6
450	15.9	534	40.2	718	10.1	702	26.4
451	21.2	535	40.2	719	4.8	703	26.9
452	26.6	536	41.2	720	0	704	26.0
453	31.9	537	41.6	721	0	705	26.0
454	37.2	538	41.6	722	0	706	29.3
455	42.5	539	41.2	723	0	707	30.9
456	44.7	540	40.6	724	0	708	32.3
457	46.8	541	40.2	725	0	709	34.6
458	50.7	542	40.2	726	0	710	36.2
459	53.1	543	40.2	727	0	711	38.2
460	54.1	544	39.3	728	0	712	35.6
461	56.0	545	37.2	729	0	713	36.6
462	56.5	546	31.9	730	0	714	37.5
463	57.3	547	26.6	731	0	715	37.8
464	58.1	548	21.2	732	0	716	36.2
465	57.9	549	15.9	733	0	717	34.6
466	58.1	550	10.6	734	0	718	33.0
467	58.3	551	5.3	735	0	719	29.0
468	57.9	552	0	736	0	720	24.1
469	57.5	553	0	737	0	721	19.3
470	57.9	554	0	738	0	722	14.5
471	57.9	555	0	739	0	723	10.0
472	57.3	556	0	740	0	724	7.2

Time (seconds)	Speed (kilometres per hour)
725	4.8
726	2.4
727	0.8
728	0.8
729	5.1
730	10.5
731	15.4
732	20.1
733	22.5
734	25.7
735	29.0
736	31.5
737	34.6
738	37.2
739	39.4
740	41.0
741	42.6
742	43.0
743	44.4
744	44.9
745	45.5
746	46.0
747	46.0
748	45.5
749	45.4
750	45.1
751	44.3
752	43.1
753	41.0
754	37.8
755	34.6
756	30.6
757	26.0
758	24.0
759	20.1
760	15.1
761	10.0
762	4.8
763	2.4
764	2.4
765	0.0
766	0
767	4.8
768	10.1
769	15.4
770	20.8
771	25.4
772	28.2
773	29.0
774	31.4
775	33.3
776	35.4
777	37.3
778	40.2
779	42.6
780	44.3
781	45.1
782	45.5
783	46.6
784	40.5
785	46.5
786	46.3
787	45.9
788	45.5
789	45.5
790	45.5
791	45.4
792	44.4
793	44.3
794	44.3
795	44.3
796	44.3
797	44.3
798	44.3
799	44.4
800	45.1
801	45.9
802	46.9
803	40.9
804	51.5
805	53.1
806	53.1
807	54.1
808	54.7

Time (seconds)	Speed (kilometres per hour)
809	55.2
810	56.0
811	54.7
812	54.7
813	54.6
814	54.1
815	53.3
816	53.1
817	52.3
818	51.5
819	51.3
820	50.9
821	50.7
822	49.2
823	48.3
824	48.1
825	48.1
826	48.1
827	48.1
828	47.6
829	47.6
830	47.5
831	47.2
832	46.5
833	45.4
834	44.6
835	43.5
836	41.0
837	38.1
838	35.4
839	33.0
840	30.9
841	29.9
842	22.3
843	23.6
844	24.4
845	25.4
846	30.4
847	37.3
848	38.6
849	40.2
850	41.8
851	42.8
852	42.6
853	43.1
854	43.5
855	43.8
856	44.7
857	45.2
858	46.3
859	46.5
860	46.7
861	46.8
862	46.7
863	45.2
864	44.3
865	43.5
866	41.5
867	40.2
868	39.4
869	39.9
870	40.4
871	41.0
872	41.4
873	42.2
874	43.3
875	44.3
876	44.7
877	45.7
878	46.7
879	47.0
880	46.8
881	46.7
882	46.5
883	45.9
884	45.2
885	45.1
886	45.1
887	44.4
888	43.8
889	42.8
890	42.5
891	44.3
892	44.7

Time (seconds)	Speed (kilometres per hour)
893	45.1
894	44.7
895	45.1
896	45.1
897	45.1
898	44.6
899	44.1
900	43.3
901	42.8
902	42.6
903	42.6
904	42.6
905	42.3
906	42.2
907	42.2
908	41.7
909	41.2
910	41.2
911	41.7
912	41.5
913	41.0
914	39.6
915	37.8
916	35.7
917	34.8
918	34.8
919	34.0
920	36.4
921	37.7
922	38.6
923	38.9
924	39.3
925	40.1
926	40.4
927	40.6
928	40.7
929	41.0
930	40.6
931	40.2
932	40.2
933	40.2
934	39.8
935	39.4
936	39.1
937	39.1
938	39.4
939	40.2
940	40.2
941	39.6
942	39.6
943	38.8
944	39.4
945	40.4
946	41.2
947	40.4
948	38.6
949	35.4
950	32.3
951	27.2
952	21.9
953	18.6
954	11.3
955	6.0
956	0.8
957	0
958	0
959	0
960	3.2
961	8.5
962	13.8
963	19.2
964	24.5
965	28.3
966	29.9
967	32.2
968	34.0
969	35.4
970	37.0
971	39.4
972	42.3
973	44.3
974	45.2
975	45.7

Time (seconds)	Speed (kilometres per hour)
976	45.9
977	45.9
978	45.9
979	44.6
980	44.3
981	43.8
982	43.1
983	42.6
984	41.8
985	41.4
986	40.6
987	38.6
988	35.4
989	34.6
990	31.6
991	25.1
992	20.2
993	17.0
994	16.7
995	16.7
996	17.0
997	16.5
998	16.5
999	16.5
1,000	17.8
1,001	18.6
1,002	19.6
1,003	19.9
1,004	20.4
1,005	21.0
1,006	21.2
1,007	21.0
1,008	20.2
1,009	18.8
1,010	18.1
1,011	17.3
1,012	16.9
1,013	16.2
1,014	15.4
1,015	14.8
1,016	13.0
1,017	12.2
1,018	11.7
1,019	11.5
1,020	11.2
1,021	6.9
1,022	1.6
1,023	0
1,024	0
1,025	0
1,026	0
1,027	0
1,028	0
1,029	0
1,030	0
1,031	0
1,032	0
1,033	0
1,034	0
1,035	0
1,036	0
1,037	0
1,038	0
1,039	0
1,040	0
1,041	0
1,042	0
1,043	0
1,044	0
1,045	0
1,046	0
1,047	0
1,048	0
1,049	0
1,050	0
1,051	0
1,052	0
1,053	1.9
1,054	6.4
1,055	11.7
1,056	17.1
1,057	22.4
1,058	27.4

Speed (kilo- metres per second): hour	Time (seconds)	Speed (kilo- metres per second): hour	Time (seconds)	Speed (kilo- metres per second): hour	Time (seconds)	Speed (kilo- metres per second): hour	Time (seconds)
1.050	29.8	1.141	41.0	1.234	34.9	1.298	43.5
1.050	32.2	1.142	39.6	1.235	34.6	1.299	44.7
1.061	35.1	1.143	37.8	1.236	34.6	1.300	45.5
1.062	37.0	1.144	34.6	1.237	34.4	1.301	46.7
1.063	38.6	1.145	33.2	1.238	33.3	1.302	48.8
1.064	39.9	1.146	32.3	1.239	31.4	1.303	48.7
1.065	41.2	1.147	25.7	1.240	30.9	1.304	45.1
1.066	42.6	1.148	22.8	1.241	31.5	1.305	39.8
1.067	43.1	1.149	17.2	1.242	31.0	1.306	34.4
1.068	44.1	1.150	11.9	1.243	32.2	1.307	29.1
1.069	44.9	1.151	6.6	1.244	31.4	1.308	23.6
1.070	45.5	1.152	1.3	1.245	28.3	1.309	18.5
1.071	45.1	1.153	0	1.246	26.9	1.310	13.2
1.072	44.3	1.154	0	1.247	20.9	1.311	7.9
1.073	43.5	1.155	0	1.248	16.1	1.312	2.6
1.074	43.5	1.156	0	1.249	12.9	1.313	0
1.075	42.3	1.157	0	1.250	9.7	1.314	0
1.076	39.4	1.158	0	1.241	6.4	1.315	0
1.077	38.2	1.159	0	1.242	4.0	1.316	0
1.078	34.6	1.160	0	1.243	1.1	1.317	0
1.079	33.2	1.161	0	1.244	0	1.318	0
1.080	29.0	1.162	0	1.245	0	1.319	0
1.081	24.1	1.163	0	1.246	0	1.320	0
1.082	19.8	1.164	0	1.247	0	1.321	0
1.083	17.9	1.165	0	1.248	0	1.322	0
1.084	17.1	1.166	0	1.249	0	1.323	0
1.085	16.1	1.167	0	1.250	0	1.324	0
1.086	15.3	1.168	0	1.251	0	1.325	0
1.087	14.6	1.169	3.4	1.252	1.6	1.326	0
1.088	14.0	1.170	8.7	1.253	1.6	1.327	0
1.089	13.8	1.171	14.0	1.254	1.6	1.328	0
1.090	14.2	1.172	19.3	1.255	1.6	1.329	0
1.091	14.5	1.173	24.6	1.256	1.6	1.330	0
1.092	14.0	1.174	29.9	1.257	2.6	1.331	0
1.093	13.8	1.175	34.0	1.258	4.9	1.332	0
1.094	12.9	1.176	37.0	1.259	6.4	1.333	0
1.095	11.3	1.177	37.8	1.260	8.0	1.334	0
1.096	8.0	1.178	37.0	1.261	10.1	1.335	0
1.097	6.8	1.179	36.2	1.262	12.9	1.336	0
1.098	4.2	1.180	32.2	1.263	16.1	1.337	0
1.099	1.6	1.181	26.9	1.264	16.0	1.338	2.4
1.100	0.9	1.182	21.6	1.265	15.3	1.339	7.7
1.101	0.3	1.183	16.3	1.266	13.7	1.340	13.0
1.102	1.0	1.184	10.9	1.267	12.2	1.341	18.3
1.103	2.6	1.185	6.6	1.268	14.2	1.342	21.2
1.104	5.8	1.186	0.3	1.269	17.7	1.343	24.5
1.105	11.1	1.187	0	1.270	22.5	1.344	27.0
1.106	16.1	1.188	0	1.271	27.4	1.345	29.5
1.107	20.6	1.189	0	1.272	31.4	1.346	31.4
1.108	22.6	1.190	0	1.273	33.8	1.347	32.7
1.109	23.3	1.011	0	1.274	36.1	1.348	34.3
1.110	25.7	1.192	0	1.275	35.7	1.349	35.2
1.111	29.1	1.193	0.0	1.276	37.0	1.350	35.6
1.112	32.2	1.194	0.0	1.277	38.0	1.351	36.0
1.113	33.6	1.195	0.0	1.278	38.8	1.352	35.4
1.114	34.1	1.196	0.0	1.279	39.4	1.353	34.8
1.115	34.3	1.197	0.3	1.280	39.4	1.354	34.0
1.116	34.4	1.198	2.4	1.281	38.6	1.355	33.0
1.117	34.9	1.199	5.6	1.282	37.8	1.356	32.2
1.118	36.2	1.200	10.5	1.283	37.8	1.357	31.5
1.119	37.0	1.201	15.8	1.284	37.8	1.358	29.8
1.120	38.3	1.202	19.3	1.285	37.8	1.359	28.2
1.121	39.4	1.203	20.8	1.286	37.8	1.360	26.6
1.122	40.2	1.204	20.9	1.287	37.8	1.361	24.9
1.123	40.2	1.205	20.8	1.288	36.6	1.362	22.5
1.124	39.9	1.206	20.6	1.289	36.6	1.363	17.7
1.125	40.2	1.207	21.1	1.290	39.4	1.364	12.9
1.126	40.9	1.208	21.1	1.291	39.8	1.365	8.4
1.127	41.5	1.209	22.5	1.292	40.2	1.366	4.0
1.128	41.8	1.210	24.0	1.293	40.9	1.367	0
1.129	42.5	1.211	27.4	1.294	41.2	1.368	0
1.130	42.8	1.212	29.9	1.295	41.4	1.369	0
1.131	43.3	1.213	31.7	1.296	41.8	1.370	0
1.132	43.5	1.214	33.8	1.297	42.2	1.371	0
1.133	43.5	1.215	34.6				
1.134	43.5	1.216	35.1				
1.135	43.3	1.217	35.1				
1.136	43.3	1.218	34.6				
1.137	43.1	1.219	34.1				
1.138	42.6	1.220	34.6				
1.139	42.5	1.221	35.1				
1.140	41.8	1.222	35.4				
		1.223	39.2				

APPENDIX II—PROCEDURE FOR DYNAMOMETER ROAD HORSEPOWER CALIBRATION

This appendix describes the method for determining the road horsepower absorbed by a chassis dynamometer. The measured absorbed road horsepower includes the dynamometer friction as well as the power absorbed by the power absorption unit. The dynamometer is driven above the test speed range. The device used to drive the dynamometer is then disengaged from the dynamometer and the roll(s) is allowed to coast down. The kinetic energy of the system is dissipated by the dynamometer friction and

absorption unit. This method neglects the variations in roll bearing friction due to the drive axle weight of the vehicle. The difference in coast down time of the free (rear) roll relative to the drive (front) roll may be neglected in the case of dynamometers with paired rolls.

These procedures shall be followed:

1. Devise a method to determine the speed of the drive roll if not already measured. A fifth wheel, revolution pickup or other suitable means may be used.
2. Place a vehicle on the dynamometer or devise another method of driving the dynamometer.

3. Engage inertia flywheel for the most common vehicle weight class for which the dynamometer is used.

4. Drive dynamometer up to 50 m.p.h.
5. Record indicated road horsepower.
6. Drive dynamometer up to 60 m.p.h.
7. Disengage the device used to drive the dynamometer.
8. Record the time for the dynamometer drive roll to coast down from 55 m.p.h. to 45 m.p.h.
9. Adjust the power absorption unit to a different level.
10. Repeat steps 4 to 9 above sufficient times to cover the range of road horsepower used.
11. Calculate absorbed road horsepower from:

$$HP = (1/2) (W/32.2) (V_1^2 - V_2^2) / (550t)$$

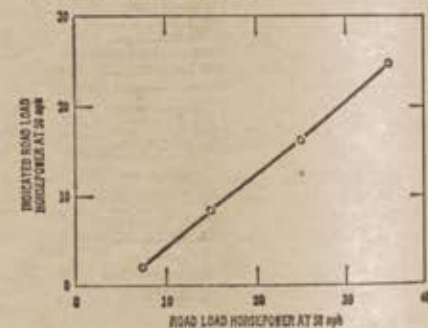
$$HP = 0.06073 (W/t)$$

Where:

- W = Equivalent inertia in lb.
 V_1 = Initial velocity in ft./sec. (55 m.p.h. = 80.67 ft./sec.)
 V_2 = Final velocity in ft./sec. (45 m.p.h. = 66 ft./sec.)
 t = Elapsed time for rolls to coast from 55 m.p.h. to 45 m.p.h.

12. Plot indicated road load horsepower at 50 m.p.h. versus road load horsepower at 60 m.p.h.

13. The road load horsepower reported in § 86.177-11 is obtained by entering the plot at the indicated road load horsepower determined in § 86.177-(e) (1).



EXAMPLE: Dynamometer calibration curve
(See No. CH-256-90-42-4)

14. Once the road load horsepower at 50 m.p.h. is known for a vehicle, it may be tested on other dynamometers using a similar calibration.

APPENDIX III—CONSTANT VOLUME SAMPLER FLOW CALIBRATION

The following calibration procedure outlines the equipment, the test setup configuration, and the various parameters which must be measured to establish the flow rate of the constant volume sampler pump. All the parameters related to the pump are simultaneously measured with the parameters related to a flowmeter which is connected in series with the pump. The calculated flow rate (ft³/rev @ pump inlet absolute pressure and temperature) can then be plotted versus a correlation function which is the value of a specific combination of pump parameters. The linear equation which relates the pump flow and the correlation function is then determined. In the event that a CVS has a multiple speed drive, a calibration for each range should be performed.

This calibration procedure is based on the measurement of the absolute values of the pump and flowmeter parameters that relate the flow rate at each point. Three conditions must be maintained to assure the accuracy and integrity of the calibration curve. First, the pump pressures should be measured at

taps on the pump rather than at the external piping on the pump inlet and outlet. Pressure taps that are mounted at the top and bottom center of the pump drive headplate are exposed to the actual pump cavity pressures, and therefore reflect the absolute pressure differentials. Secondly, temperature stability must be maintained during the calibration. The laminar flowmeter is sensitive to inlet temperature oscillations which cause the data points to be scattered. Gradual changes ($\pm 2^\circ\text{F}$) in temperature are acceptable as long as they occur over a period of several minutes. Finally, all connections between the flowmeter and the CVS pump must be absolutely void of any leakage.

During a CVS emissions test the measurement of these same pump parameters enables the user to calculate the flow rate from the calibration equation.

After the calibration curve has been obtained, a verification test of the entire system can be performed by injecting a known mass of gas into the system and comparing the mass indicated by the system to the true mass injected. An indicated error does not

necessarily mean that the calibration is wrong, since other factors can influence the accuracy of the system.

Equipment:

The following list of equipment will be needed to perform this calibration procedure. Figure 1 illustrates a typical equipment arrangement used for calibration. All of the equipment involved should conform to the range and accuracy as specified in Figure 1.

Equipment List:

1. LFE—Laminar Flowmeter
 2. Micromanometer
 3. Thermometer
 4. Timer
 5. U-Tube Manometers
 6. Temperature Indicator with type J Thermocouples
 7. A variable flow restrictor with appropriate piping to connect the CVS pump and LFE.
- After the system has been connected as shown in Figure 1, set the variable restrictor in the wide open position and run the CVS pump for twenty minutes. Record the calibration data.

CALIBRATION DATA MEASUREMENTS

Parameter	Symbol	Units	Tolerance
Barometric pressure (corrected).....	P_B	"Hg.....	± 0.1 "Hg.
Ambient temperature.....	T_A	$^\circ\text{F}$	± 0.5 $^\circ\text{F}$.
Air Temperature into LFE.....	ETI	$^\circ\text{F}$	± 1 $^\circ\text{F}$.
Pressure depression upstream of LFE.....	EPI	"H ₂ O.....	± 1 "H ₂ O.
Pressure drop across the LFE matrix.....	EDP	"H ₂ O.....	± 0.05 "H ₂ O.
Air temperature at CVS pump inlet.....	PTI	$^\circ\text{F}$	± 0.5 $^\circ\text{F}$.
Pressure depression at CVS pump inlet.....	PPI	"Fluid.....	± 0.05 "Fluid.
Specific gravity of manometer fluid.....	Sp. Gr.		
Pressure head at CVS pump outlet.....	PPO	"Fluid.....	± 0.05 "Fluid.
Air temperature at CVS pump outlet (optional).....	PTO	$^\circ\text{F}$	± 0.5 $^\circ\text{F}$.
Pump revolutions during test period.....	N	Revs.....	None.
Elapsed time for test period.....	t	Seconds.....	± 0.05 Seconds.

Note.—The fluid level in the manometer tube should stabilize before the reading is made and the elapsed time for revolution counting should be greater than 120 seconds.

Reset the restrictor valve to a more restricted condition in an increment of pump inlet depression (about 4" H₂O) that will yield a minimum of six data points for the total calibration.

Allow the system to stabilize for 3 minutes and repeat the data acquisition.

Data Analysis:

The data recorded during the calibration are to be used in the following calculations.

1. The air flow rate at each test point is calculated in standard cubic feet per minute (Q_s) from the flowmeter data using the manufacturer's prescribed method.

2. The air flow rate is then converted to pump flow, V_o , in cubic feet per revolution at absolute pump inlet temperature and pressure.

$$V_o = \frac{Q_s}{n} \times \frac{T_s}{530} \times \frac{29.92}{P_s}$$

Where:

Q_s = Meter air flow rate in standard cubic feet per minute (flowmeter standard conditions are 70°F, 29.92 "Hg).

n = Pump speed in revolutions per minute.

P_s = Absolute pump inlet pressure, in ("Hg).

$T_s = PPI + PPI (SP.GR./13.57)$, $T_s = PTI + 460$.

3. The correlation function at each test point is then calculated from the calibration data, as follows:

$$X_s = \frac{1}{n} \sqrt{\frac{\Delta P_s}{P_s}}$$

ΔP_s = The pressure differential from pump inlet to pump outlet in ("Hg).

$$\Delta P_s = P_s - P_o$$

P_o = Absolute pump outlet pressure, in ("Hg).

$$P_s = P_B + PPO (Sp. Gr./13.57)$$

See § 86.177-22 for other definitions.

4. A linear least squares fit is performed to generate the calibration equations which have the forms

$$V_o = D_o - M(X_s)$$

$$n = A - B(\Delta P_s)$$

D_o , M , A , and B are the slope-intercept constants describing the lines.

A CVS system that has multiple speeds should be calibrated on each speed used. The calibration curves generated for the ranges will be approximately parallel and the intercept values, D_o , will increase as the pump flow range decreases.

If the calibration has been performed carefully, the calculated V_o values from the equation will be within $\pm 0.50\%$ of the measured value of V_o . Values of M will vary from one pump to another, but values of D_o for pumps of the same make, model, and range should agree within ± 3 percent of each other. Particulate influx from use will cause the pump slip to decrease as reflected by lower values for M . Calibrations should be performed at

0, 50, 100, 200, 400, etc. hours of pump operation to assure the stability of the pump slip rate. Analysis of mass injection data will also reflect pump slip stability.

CVS System Verification:

The following technique can be used to verify that the CVS and analytical instruments can accurately measure a mass of gas that has been injected into the system.

1. Obtain a small cylinder that has been charged with pure propane or carbon monoxide gas (caution—carbon monoxide is poisonous!). Critical flow orifice devices can also be used for constant flow metering.
2. Determine a reference cylinder weight to the nearest 0.01 gram.
3. Operate the CVS in the normal manner and release a quantity of pure propane or carbon monoxide into the system during the sampling period.
4. The calculations of § 86.177-22 are performed in a normal way except, in the case of propane, the density of propane (17.30 grams/cu./ft./carbon atom) is used in place of the density of exhaust hydrocarbons. In the case of carbon monoxide, the density of 32.97 grams/cu. ft. is used.
5. The gravimetric mass is subtracted from the CVS measured mass and then divided by the gravimetric mass to determine the percent accuracy of the system.
6. The cause for any discrepancy greater than ± 2 percent should be found and corrected.

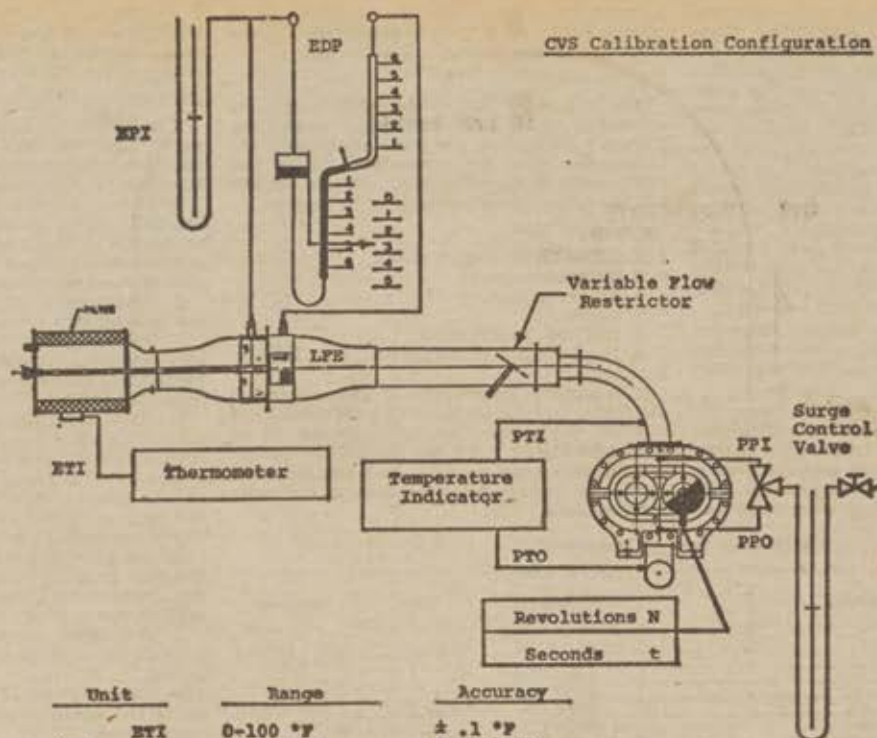
The following list of parametric errors may assist the operator in locating the cause of large errors.

Positive Error (Indication is higher than true value):

1. Calculated V_o is greater than actual V_o .
 - a. Original calibration in error.
2. Pump inlet temperature recorder is reading low. A 5° F. discrepancy will give a 1 percent error.
3. Pump inlet pressure indicator is reading high. A 3.5 in. H₂O high reading will give 1 percent error.
4. Background concentration reading is too low. Check analyzer zero. Check leakage at floor inlet.
5. Analyzer is reading high. Check span.
6. Barometer reading is in error (too high). Barometric pressure reading should be gravity and temperature corrected.
7. Revolution counter is reading high (Check pump speed and counters.)
8. Mixture is stratified causing the sample to be higher than the average concentration in the mixture.

Negative Error (Indication is lower than true value):

1. Calculated V_o is less than actual V_o .
 - a. Original calibration in error.
 - b. Pump clearances decreased due to influx of some surface adherent material. Recalibration may be needed.
2. Pump inlet temperature recorder is reading high.
3. Pump inlet pressure indicator is reading low.
4. Background concentration reading is too high.
5. Analyzer is reading low.
6. Barometer reading is in error (too low).
7. Revolution counter is reading low.
8. There is a leak into the sampling system. Pressure check the lines and fittings on the intake side of sample transfer pumps on both the CVS and analyzer console.



Unit	Range	Accuracy	
LFE	ETI	0-100 °F	± .1 °F
	EPI	0-10 "H ₂ O	± .1 "H ₂ O
	EDP	0-10 "H ₂ O	± .005 "H ₂ O
Pump	PTI	0-250 °F	± .5 °F
	PFI	0-36 "Fluid	± .05 "Fluid
	PPO	0-36 "Fluid	± .05 "Fluid
	PTO	0-250 °F	± .5 °F
	N	0-100,000	± 0
t	0-10,000 secs.	± .05 secs.	

Note: Fluid used in 36 inch manometer should extend range to at least 0-60 "H₂O. Separate manometers for PFI and PPO may be used during calibration.

Figure I—CVS Calibration Configuration

APPENDIX IV—DURABILITY DRIVING SCHEDULES

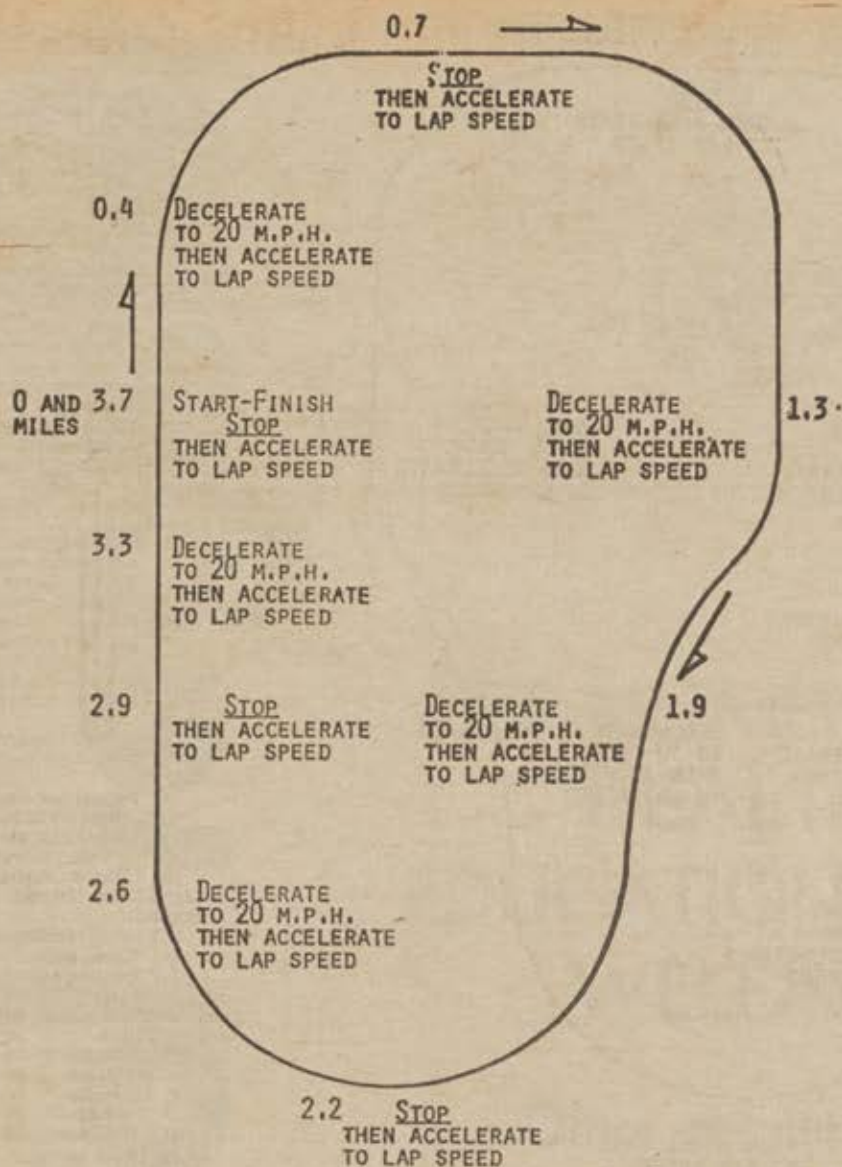
(a) Durability Driving Schedule for Light-Duty Vehicles and Light-Duty Trucks.

The schedule consists basically of 11 laps of a 3.7 mile course. The basic vehicle speed for each lap is listed below:

Lap:	Speed miles per hour
1	40
2	30
3	40

4	40
5	35
6	30
7	35
8	45
9	35
10	55
11	70

During each of the first nine laps there are 4 stops with 15 second idle. Normal accelerations and decelerations are used. In addition, there are 5 light decelerations each lap from the base speed to 20 m.p.h. followed by light accelerations to the base speed.



ALL STOPS ARE 15 SECONDS

Speed (kilometers per hour)

Lap	Class I	Class II	Class III
1.....	65	65	65
2.....	45	45	45
3.....	65	65	65
4.....	65	65	65
5.....	55	55	55
6.....	45	45	45
7.....	55	55	55
8.....	70	70	70
9.....	55	55	55
10.....	70	90	90
11.....	70	90	110

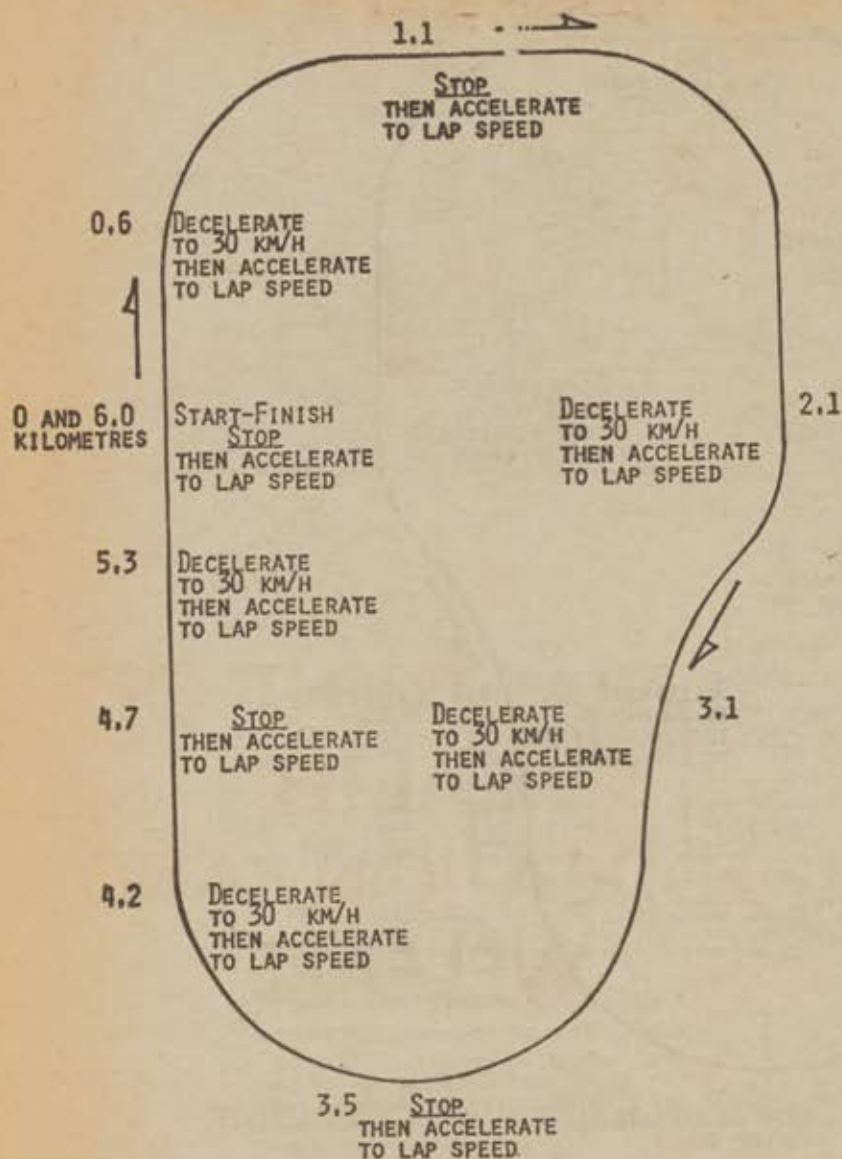
The 10th lap is run at a constant speed of 55 m.p.h.

The 11th lap is begun with a wide open throttle acceleration from stop to 70 m.p.h. A normal deceleration to idle followed by a second wide open throttle acceleration occurs at the midpoint of the lap.

(b) Durability Driving Schedule for Motorcycles. The Durability Driving Schedule for Class III Motorcycles may be used for Light-Duty Vehicles and Light-Duty Trucks.

The schedule consists basically of 11 laps of a 6.0 km (3.7 mi) course. The basic vehicle speed for each lap is listed below:

RULES AND REGULATIONS



During each of the first nine laps there are 4 stops with 15 second idle. Normal accelerations and decelerations are used. In addition, there are 5 light decelerations each lap from the base speed to 30 km/h followed by light accelerations to the base speed.

The 10th lap is run at a constant speed. The 11th lap is begun with a wide open throttle acceleration from stop. A normal deceleration to idle followed by a second wide open throttle acceleration occurs at the mid-point of the lap.

This schedule may be modified with the advance approval of the Administrator if it results in unsafe operation of the vehicle.

ALL STOPS ARE 15 SECONDS

APPENDIX V--[RESERVED]

APPENDIX VI--VEHICLE AND ENGINE COMPONENTS

(a) Light-Duty Vehicles, Light-Duty Trucks, Motorcycles, and Gasoline-Fueled Heavy-Duty Engines.

- I. Basic Mechanical Components--Engine.
 - (1) Intake and exhaust valves.
 - (2) Drive belts.
 - (3) Manifold and cylinder head bolts.
 - (4) Engine oil and filter.
 - (5) Engine coolant.
- (6) Cooling system hoses and connections.

(7) Vacuum fittings, hoses, and connections.

(8) Oil injection metering system.

II. Fuel System.

(1) Fuel specification-octane rating, lead content.

(2) Carburetor-idle RPM, mixture ratio.

(3) Choke mechanism.

(4) Fuel system filter and fuel system lines and connections.

(5) Choke plate and linkage.

III. Ignition Components.

(1) Ignition timing and advance systems.

(2) Distributor breaker points and condenser.

(3) Spark plugs.

(4) Ignition wiring.

(5) Operating parts of distributor.

IV. Crankcase Ventilation System.

(1) PCV valve.

(2) Ventilation hoses.

(3) Oil filler breather cap.

(4) Manifold inlet (carburetor spacer, etc.).

V. External Exhaust Emission Control System.

(1) Secondary air injection system hoses.

(2) Air system manifolds

(3) Control valves and air pump.

(4) Manifold reactors.

(5) Catalytic converters.

(6) Exhaust recirculation.

(7) Water injection.

VI. Evaporative Emission Control System.

(1) Engine compartment hose connections.

(2) Carbon storage media.

(3) Fuel tank pressure-relief valve operation.

(4) Fuel vapor control valves.

VII. Air Inlet Components.

(1) Carburetor air cleaner filter.

(2) Hot air control valve.

(b) Diesel Light-Duty Vehicles, Diesel Light-Duty Trucks, and Diesel Heavy-Duty Engines.

I. Engine Mechanical Components.

(1) Valve train.

(2) Cooling system.

a. Coolant.

b. Thermostat.

c. Filter.

(3) Lubrication.

a. Oil filter.

b. Lubricant.

II. Fuel System.

(1) Fuel type.

(2) Fuel pump.

(3) Fuel filters.

(4) Injectors.

(5) Governor.

III. Air Inlet Components.

(1) Air cleaner.

(2) Inlet ducting.

IV. External Exhaust Emission Control System.

(1) Rack limiting devices (aneroid, throttle delay, etc.).

(2) Manifold reactors.

(3) Catalytic converters.

(4) Exhaust recirculation.

(5) Water injection.

[FR Doc.77-17973 Filed 6-27-77;8:45 am]

Federal Register

TUESDAY, JUNE 28, 1977

PART IV



**DEPARTMENT OF
HEALTH,
EDUCATION, AND
WELFARE**

Office of Education



**WOMEN'S
EDUCATIONAL EQUITY
ACT PROGRAM**

Title 45—Public Welfare

CHAPTER I—OFFICE OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PART 160f—WOMEN'S EDUCATIONAL EQUITY ACT PROGRAM

AGENCY: Office of Education (OE), HEW.

ACTION: Final regulations.

SUMMARY: This document amends the regulations as required by the Education Amendments of 1974 to simplify the language, simplify the preapplication process, eliminate priority areas for general grants and adjust evaluation criteria and the basis for award decisions.

EFFECTIVE DATE: Pursuant to section 431(d) of the General Education Provisions Act, as amended (20 U.S.C. 1232(d)), this regulation has been transmitted to the Congress concurrently with its publication in the FEDERAL REGISTER. That section provides that regulations subject thereto shall become effective on the forty-fifth day following the date of such transmission, subject to the provisions thereof concerning congressional action and adjournment.

FOR FURTHER INFORMATION CONTACT:

Dr. Mary Jane Smalley, U.S. Office of Education, Room 2145, 400 Maryland Avenue SW., Washington, D.C. 20202 (202-245-2181).

SUPPLEMENTARY INFORMATION:

BACKGROUND.

The Women's Educational Equity Act Program is a discretionary program in the Office of Education authorized by the Education Amendments of 1974, Pub. L. 93-380, with a stated purpose to provide educational equity for women. This is defined in the regulation as including both the elimination of inequity which prevents full and fair participation by women in educational programs and in American society generally and the achievement of responsiveness by educational leaders and other personnel to the special educational needs, interests, and concerns of women arising from inequitable education policies and practices.

The Act authorizes activities at all levels of education: preschool, elementary and secondary education, higher education, and adult education. The Act provides likewise for an extremely broad range of program activities: The development, evaluation, and dissemination of curricula, textbooks, and other educational materials; training for educational personnel; research and development; guidance and counseling activities; educational activities for adult women; educational programs for women in vocational education; career education, physical education, and educational administration.

Both grants and contracts may be awarded in the areas listed above. In addition to general grants in these areas, the statute authorizes a program of small

grants, not to exceed \$15,000, in order to support innovative approaches to the achievement of educational equity for women. In the first year of program operation, contracts were awarded for two major national activities: technical assistance in the implementation of Title IX of Pub. L. 92-318 and a communications network to provide a wide range of information services to individuals and institutions.

The law specifies that public agencies, private non-profit organizations, and individuals are eligible for awards under the program.

PUBLIC RESPONSE TO THE NOTICE OF PROPOSED RULEMAKING

In contrast to the large numbers of comments received on the Advance Notice of Proposed Rulemaking published on October 21, 1976 (41 FR 46576-78), only eight written comments were received on the Notice of Proposed Rulemaking. Hearings were conducted in ten locations across the country. They were generally well attended (a total of 350 persons) and provided an opportunity for extensive dialogue between the Office of Education and participants. Two issues were raised quite frequently: (1) The unrealism of the deadlines for preapplications and applications, and (2) the disastrous effect of making grant awards as late as September or October to projects which work in or with educational systems. Neither can be remedied in the regulation. The Office of Education plans to address them in administering the program. Some formal comments on the regulations were made at the meetings and are considered with the written comments in this preamble. The National Advisory Council on Women's Educational Programs reviewed the proposed rule and provided its comments in writing to the Commissioner.

The overall reaction to the regulation was that it was a substantial improvement over the regulation used in the first year of the program. Commenters praised the increased flexibility, the elimination of priorities, reduction of jargon, addition of definitions, and simplification of the preapplication process.

The following specific comments were made either in writing or at the hearings. After the summary of each comment, a response follows stating changes which have been made in the regulation, or the reasons why no change is deemed appropriate. The comments appear in the order of the sections of the final regulation. There are no significant differences from the Notice of Proposed Rulemaking which was published in the FEDERAL REGISTER on April 1, 1977 (42 FR 17700-11).

GENERAL

Comment. Concern was expressed about the difficulty in coping with Government regulations and forms for persons and organizations which have had no previous experience. Although the WEEA regulation was commended for its improvement over the previous regulation in this regard, some commenters indicated that the problem still exists. One

commenter asked that the regulation be simplified into one page. Another commenter recommended various outreach efforts to reduce fear of the application process and commended the regional hearing in which the comment was made for helping to do just that. One commenter differed in attitude to the regulation and the criteria and described herself as a "satisfied customer," though by no means a professional grantperson.

Response. Several steps have already been taken to respond to these concerns. First, the revision of last year's regulation was deemed imperative, though it meant a late announcement of the competition, minimum time before application deadlines, and no awards possible before September—all serious issues. Secondly, hearings were conducted at ten locations throughout the country and were judged helpful in providing technical assistance. In addition, other efforts to deal more specifically with the problem are currently being planned to enable persons to work with regulations with greater ease. At the hearings, persons working for educational equity for women repeatedly made requests for assistance to gain expertise in both project and application development.

SECTION 160f.1(e) TEXTBOOKS AND CURRICULAR MATERIALS

Comment. One commenter noted that this paragraph had been altered slightly in punctuation and wording. Although advised by legal counsel that the revision did not change the substance, the commenter requested confirmation in the preamble that the change was technical only, was not meant to be substantive, and should not be interpreted as signifying a dilution of the provision's original intent.

Response. The commenter is absolutely correct. The change was solely editorial and has no impact on the intent or meaning of the statement.

SECTION 160f.2 DEFINITIONS

Comment. One commenter asked for clarification between "target population" and "population groups."

Response. A definition of "target population" was included in § 160f.2 of the regulation. Population groups are defined in § 160f.3(d) where the regulation states that a project may focus on the approach to educational equity for women relating to one or more population groups based on race, ethnic origin, age, socioeconomic status, or residence (e.g., rural, urban, Southwestern, Appalachian). "Target population" appears in §§ 160f.7(c)(2)(ii)(B), 160f.8(c)(2)(iii) and (3)(ii); "Population group(s)" appears in §§ 160f.3(d), 160f.8(c)(2)(iii) and (3)(iii), and 160f.10(a)(2)(i)(B) and (ii).

Comment. One comment indicated that the use of "validation procedures" in the regulation is difficult for persons not familiar with such terminology.

Response. A definition of validation as it is used in the WEEA Program has been added. It includes both a general and a more technical description.

SECTION 160f.3 NATURE OF PROJECTS

Comment. Several commenters welcomed the use of a synonym for "capacity building." With two exceptions, the continuation of the concept was endorsed by all who commented. One commenter questioned whether any model can be replicated and whether anyone will ever use anyone else's materials. One comment raised the issue of continued advisability of emphasizing "products" with a potential "future impact" instead of supporting projects likely to have a broad immediate impact, regional or nationwide.

Response. Projects likely to have a broad immediate impact, regional or nationwide, would appear to meet the requirements for the "development of model programs and products." In view of the scope of the Act, the extent of the need, and the limited funds available, the Office of Education is not prepared to change this policy in order to provide assistance funds for the benefit of individuals and local groups. No change has been made in the regulation.

Comment. A number of commenters addressed the issue of dissemination. They cited the priority it must be given in this program if national needs in the area of educational equity for women are to be met and if the purpose of the program requirement for the development of model programs and products which can be used in other places is to be fulfilled.

One commenter requested the addition and clarification of information on the role and responsibilities of the grantee and of the Office of Education regarding dissemination.

Response. The importance of dissemination is well understood. A contract to manage the dissemination of programs and products developed under WEEA has been issued. A reference to it appears in § 160f.14(b) (3). References to "applicants and others" have been deleted in §§ 160f.8(c) (3) (v) and 160f.10(a) (2) (iii) (B).

SECTION 160f.5 DURATION OF PROJECTS

Comment. A few commenters asked why all the grants were not multi-year awards. Two reasons for the comment were given: the need to provide greater opportunities for new people to start new things as well as the fact that projects concerned with the deeply embedded beliefs and practices related to sex bias require time to develop and test.

Response. The policy decision that a substantial proportion of the awards would be for single-year projects was made to ensure that new funds would be available in subsequent years to start new projects. The encouragement of one-year projects also reflects recognition by the Office of Education that many individuals and organizations had already been doing excellent work in educational equity for women and WEEA funds for one year might complete these efforts and make their results available as quickly as possible. The demand for quick, demonstrable results comes from people throughout the country as well as

from the Congress, the Department, and other officials in the Executive Branch.

SECTION 160f.7 PREAPPLICATIONS

Comment. Many commenters endorsed the three-page preapplication and simplified information required. One comment questioned the validity of using the preapplication process unless all applicants are required to use it as a condition for submitting an application. Several commenters expressed negative views on the preapplication, its usefulness to applicants, and its costs to the Government.

Response. The policy of the Department of Health, Education, and Welfare presently does not allow the Office of Education to reject or prejudice an application if it is submitted on time for a published closing date for applications solely because the applicant did not previously submit a preapplication. Nor does the Department of HEW permit the rejection or prejudice of an application if the preapplication was considered to lack potential to compete successfully with other applicants. Within these constraints, the Women's Program Staff responsible for this program found last year that most applicants did use the preapplication process and did follow the advice about whether or not to submit a full application. Some applicants who did not submit preapplications and some who were not encouraged to submit an application did submit applications, and some of both types were funded. The Commissioner believes that the purposes of the preapplication process, so heavily endorsed by the public in the comments received last fall on the Advance Notice of Proposed Rulemaking, can still be achieved within the present constraints.

All previous commenters have viewed the preapplication process as a method to save resources for applicants as well as for the Government. The Commissioner will consider the new comments in decisions for future years about using the preapplication. No change has been made in the regulation. It does not require preapplications, but only describes the conditions which apply in any fiscal year if the Commissioner exercises the option to include use of the preapplication in the competitive process.

On the basis of this year's experience, the final regulation provides that the program narrative of a preapplication may not exceed five pages.

SECTIONS 160f.7(d) AND 10 EVALUATION CRITERIA

Comment. In general, most commenters expressed the view that the evaluation criteria were clear and would reasonably measure factors important to the success of projects in this program.

Several commenters, however, believed that too many points were assigned to the previous experience in educational equity for women either of the applicant or of the proposed director and staff. One comment noted that this practice would defeat the purpose of the Act "because not that many people or institutions can have experience at this time." Other

commenters expressed the view that the emphasis on previous experience, in addition to the quantity of one-year-only projects, made it impossible for new people with new ideas to compete successfully. One commenter said that the weight given to applicant qualifications placed school districts at a competitive disadvantage and denied them the opportunity for staff development. One commenter stated that the points awarded for applicant qualifications were particularly out of balance to the minimal weight given to evaluation, a very important element in the success of the project and of the national program.

Other commenters took the opposite view: that people and organizations which have been working for a number of years in this field would be more efficient and therefore more productive and should be rewarded for previous efforts by this program.

Response. The number of points awarded for previous experience in educational equity for women of the applicant and of the proposed director and staff is consistent with the program's major goal of developing and disseminating model programs and programs which are tested for effectiveness. Logically, the program must seek the most competent and committed applicants and personnel to undertake such tasks.

The weight given to these factors is also consistent with the advice which has been received in the Office of Education since the early formulation of the WEEA Program emphases. Individuals and organizations have repeatedly recommended that previous efforts in educational equity for women be considered.

Applicants and personnel who are inexperienced in this area are not excluded from competition. Applications may obtain high scores, despite weaknesses in experience, if the application is strong in the many other factors which are considered in the evaluation criteria.

Comment. One comment identified an area of concern regarding the evaluation of applicant qualifications by reviewers. The commenter recommended that every effort be made to eliminate stereotypes of professional fields or disciplines, stating: "Some professional fields which have historically been composed mostly of women have had to battle such subtle and unrecognized forms of discrimination associated with stereotyping. We are not asking that special consideration be given any field. We encourage special efforts to see that stereotypes do not get in the way of accurate interpretation of information in proposals."

Response. The point is well taken. In the future, the instructions to reviewers will include a reminder to them to be alert to possibilities of such stereotyping and to honor fully the diversity of approaches to educational equity for women which is recognized by the program regulation.

Every effort is made to obtain knowledgeable reviewers who are sensitive to aspects of discrimination and stereotyping in this field. Under the Office of Edu-

ation's procedures for the review of grant applications, reviewers must score applications in accordance with priorities and criteria, explanations and instructions, and solely on the content in the application. Further, the reviewers are to score solely on the basis of their best judgment and to the degree to which the application meets the criteria.

No changes have been made in the regulation on the number of points awarded for applicant qualifications.

Comment. Two respondents objected to the proposed criterion for review of applications in § 160f.10(a)(vi). The criterion concerns the applicant's commitment to the project, through in kind or direct financial contributions or through procedures to use all or parts of the program or products developed under the grant in the continuing activities of the applicant. The respondents argued that (1) the level of cost sharing is not relevant to an applicant's qualifications; (2) the criterion sought to do indirectly what the Government could not do directly; i.e., influence indirect cost rates; and (3) cost competition is inconsistent with the purpose of grants because it gives an unfair advantage to wealthier institutions.

Response. The sole purpose of the subject criterion is to permit consideration of an applicant's commitment to the project. OE has found this to be an important ingredient in predicting a project's success. Moreover, cost sharing is not the only measure of the applicant's commitment to the project. An applicant which proposed no financial contribution to the project could still earn the maximum number of points assigned to this criterion by demonstrating procedures to use all or parts of the program or products developed under the grant in the continuing activities of the applicant.

Further, funds available for the program are severely limited. Under these circumstances it is entirely appropriate in weighing equally meritorious applications to consider and give some weight to the Department's share of the costs and therefore the number of projects that can be funded. If a wider variety of projects can be supported, the Federal assistance has potential for a greater impact in carrying out the program's purposes.

In order to make it clear that the ability to cost share is not one of the applicant's "qualifications," the subject criterion has been deleted from § 160f.10(a)(1) Applicant Qualifications and inserted in § 160f.10(a)(2) Need and Impact. Also, the objection to language designed to influence indirect cost rates is well taken. No such intent is expressed in the final rule.

Comment. Several comments addressed the issue of geographical distribution of awards in § 160f.10(a)(4): Were there State allocations? Why did so many awards go to the South and West last year? Will funds be available on a regional basis as last year or is it going to where the best request comes from?

Response. There are no State or regional allocations. The law requires "ap-

propriate" geographical distribution, but not any specific distribution according to population. The "South" and the "West" did not receive a disproportionate number of grants last year.

The provision in the regulation states that up to 20 points may be awarded in order to have an appropriate geographical distribution of project awards. If an application receives a low score, however, the addition of 20 points based on geography would not bring it into the competitive range. No change has been made in the regulation.

SEC. 160f.12 GENERAL GRANTS

Many commenters endorsed the elimination of priority areas. One commenter, however, did not understand how the program could have changed its plans after publishing the Advance Notice of Proposed Rulemaking last October which identified the preschool level and rural and minority populations as proposed priorities. One comment expressed understanding of the rationale for not identifying rural populations as a program priority but expressed concern that in all areas of program decisions, particularly dissemination, attention should be given to the special problems of rural areas. The commenter also noted that the HEW regional offices are all in urban areas and do not always communicate adequately with their rural constituents.

One commenter asked if all projects had to focus on poor, rural, or minority women, an impression the person has received from the description of projects in last year's annual report.

Several commenters expressed concern that with no priorities, the program gives no credence to the fact that educational equity for women impacts on different women in different ways. A comment recommended that the program set priorities on the needs of some women.

One comment repeated its recommendation submitted last December in response to the Advance Notice of Proposed Rulemaking which strongly endorsed the identification of priorities for WEEA and recommended sports, textbooks, dissemination, incentives for change, and minority and rural populations.

One commenter recommended that priority be given to women over 40, post high school graduates, and average women. Other commenters recommended that the program should provide funds to help women in need instead of giving grants to higher education. A comment recommended that the grant program be reduced and that more contracts should be awarded for specific projects which the Government identified as most necessary.

Response. Although support for the elimination of priorities this year was substantial, an absence of unanimity regarding the establishment of priorities in this program continues. No change has been made in this final regulation to impose priorities for fiscal year 1977. The kinds of applications received this year will be analyzed carefully by the Office of Education and by the National

Advisory Council on Women's Educational Programs. As a result of this analysis, a decision will be made regarding this issue for fiscal year 1978. The final regulation provides for the possible publication of priorities in an Appendix on the basis of annual decisions.

Although applications addressing special population groups based on race, ethnic origin, age, socioeconomic status, or residence do not receive additional points, there is a specific provision in § 160f.3(d) for applicants to develop projects which focus on one or more of these groups. The program has not set priorities on the needs of different girls and women. The degree of need and potential impact of projects are elements in the evaluation criteria for all applications, and in this way the factor of relative needs among groups may be considered.

The Advance Notice of Proposed Rulemaking invited public comments before a rule was formally proposed. The Office of Education did not go forward with its proposal for three new priorities on the basis of those public comments. An analysis of the comments and the rationale for the decisions ultimately made were described in some detail in the preamble to the Notice of Proposed Rulemaking. The change was surprising to some, like the commenter who did not understand how the three proposed new priorities could disappear. If the process of public discussion of issues before a rule is proposed is honored, however, the results must not be predetermined.

Some of the recommendations for a priority to provide funds to address the most urgent needs of women would not meet the program requirement for the development of model programs and products. The amount of funds available to the WEEA Program precludes the provision of direct services and benefits to individuals and groups throughout the country who need help. Further, this program provides educational equity for women and cannot address all the needs which women have related to health, legal rights, credit, transportation, child care. It cannot support projects to provide equity in areas outside education where inequities exist.

The Office of Education will continue to identify areas which are not being covered in the grant program, or which cannot be covered there, and will issue contracts.

No change has been made in the regulation regarding general grants.

SECTION 160f.13 SMALL GRANTS

Comment. Several comments were made on the small grant program. With one exception, they continue to be positive. A comment recommended that the small grant program continue the requirement that projects develop model programs or products and not be designed primarily to provide direct services or benefits to individuals or groups. Commenters asked whether small grant applications are subject to the application requirements for general grants and whether the dissemination contract will serve small grants also.

A commenter did question the validity of small grants, since they seemed to differ from general grants only in the amount of money. An alternative suggested was the support of WEEA coordinators in the Regional Offices of Education or in the State departments of education. The commenter recommended a study in the cost efficiency of small grants compared to general grants.

Response. Small grants must meet the same application requirements and are reviewed by the same evaluation criteria as general grants. Appropriate consideration to the scope and amount of the proposed award (\$15,000 or under) is made. References to this factor appear in §§ 160f.8(d) and 160f.10(c). The contract for dissemination covers small grants.

The Office of Education is following the progress of small grants, which are specifically mandated in the authorizing legislation. To date, the indicators are promising. Most commenters have praised small grants and recommended that their number be increased. WEEA Program funds could not be used to pay salaries of Federal employees working in Regional Offices of Education. Because of the three year authorization of the Women's Educational Equity Act and its designation as a demonstration program, the support of positions in all State Departments of Education would not be appropriate.

No change has been made in the regulation.

SECTION 160f.15 ALLOWABLE COSTS

Comment. Two comments objected to the inclusion of specific provisions regarding allowable costs in proposed § 160f.15. The comments expressed the view that some of the provisions merely restated in different words general OMB, Department, and Office of Education cost policies, while others were at variance with the general policies. The comments recommended that the final regulation merely cross-referenced the general cost principles.

One comment suggested that a ceiling of 20% be placed upon indirect costs so that a greater proportion of funds could be used for product development and dissemination. Another asked that a summary of provisions on indirect costs be included.

Response. No change has been made in the regulation. The regulation already does cross-reference general cost policies of the Office of Education (which reflect the OMB and Department policies) in the OMB and Department policies) in § 160f.15(a). However, a limited number of specific provisions on costs are set forth in § 160f.15(a) for the purpose of providing additional guidance to applicants. Many applicants under this program, including individual persons and informal nonprofit groups, are inexperienced in Federal grant matters. The subject provisions relate to specific cost items on which there are recurring questions and serve to give extra guidance to these persons and groups. With respect to the items concerning depreciation and use allowances and memberships, sub-

scriptions, and professional activities, § 160f.15(a) requires specific approval for inclusion of these items. (The general cost principles do not require specific approval.) Specific approval is required because of the very limited funds available for the program. The Commissioner deems it important to maintain some control over the extent of these costs in specific projects. Absent the requirement for prior approval, it is possible that substantial funds would go for these activities which would not directly further the purposes of the program. As a result, the potential program impact would be diluted.

With respect to the issue of limiting indirect costs, uniform rates for these costs are established in negotiations by Department representatives with award recipients. Individual programs are not free to establish by regulation separate limits on these costs. Indirect costs are summarized in the appendices to the OE General Provisions regulation (Subchapter A of this chapter, 45 CFR Parts 100, 100a, 100b) and in supplementary materials issued by the Department. Applicants interested in obtaining these materials may write to the Women's Program Staff at the address given above.

In addition to the changes noted above, a number of typographical and editorial changes have been made.

(Section 408 of the Education Amendments of 1974 (Pub. L. 93-380), as amended by section 501(a)(8) of the Education Amendments of 1976 (Pub. L. 94-482).)

NOTE.—The Office of Education has determined that this document does not contain a major proposal requiring preparation of an Inflation Impact Statement under Executive Order 11821 and OMB Circular A-107.

(Catalog of Federal Domestic Assistance No. 13.565, Women's Educational Equity Act Program.)

Dated: June 3, 1977.

ERNEST L. BOYER,
U.S. Commissioner of Education.

Approved: June 21, 1977.

JOSEPH A. CALIFANO, Jr.,
Secretary of Health,
Education, and Welfare.

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AUTHORITY: Sec. 408, Pub. L. 93-380 (20 U.S.C. 1866)

§ 160f.1 Scope and purpose.

(a) *Scope.* The regulations in this part govern projects awarded with funds ap-

propriated under the Women's Educational Equity Act of 1974, section 408 of Pub. L. 93-380, or with funds made available for expenditure under the Women's Educational Equity Act pursuant to the Special Projects Act, as enacted by section 402 of Pub. L. 93-380.

(20 U.S.C. 1866 and 1861.)

(b) *Purpose.* The purpose of the program carried out under this part is to provide, through grants and contracts, educational equity for women in the United States.

(20 U.S.C. 1866 (c) and (f).)

(c) *Other pertinent regulations.* (1) *Grant awards.* Grant awards under this part, including awards to individuals, are subject to applicable provisions contained in subchapter A of this chapter (relating to fiscal, administrative, property management, and other matters, 45 CFR Parts 100, 100a et seq.).

(2) *Contract awards.* Contract awards under this part, including awards to individuals, are subject to applicable provisions contained in 41 CFR Chapters 1 and 3.

(20 U.S.C. 1866.)

(d) *Participation by men; nondiscrimination.* (1) Award recipients may not discriminate on the basis of sex in employment or in the admission of participants to training, validation, or other activities funded under this part.

(2) The selection of persons to participate in training, validation, and other activities funded under this part must be based upon criteria which measure the extent to which the persons:

- (i) Will benefit from the activities; and
- (ii) Can contribute to the project's purposes.

(20 U.S.C. 1866.)

(e) *Textbooks and curricular materials.* Nothing in this part shall be interpreted as requiring, prohibiting, or abridging the use of particular textbooks or curricular materials.

(20 U.S.C. 1866(d)(1)(A); 20 U.S.C. 1232a.)

§ 160f.2 Definitions.

As used on this part: (a) "Act" means the Women's Educational Equity Act of 1974, section 408 of Pub. L. 93-380.

(20 U.S.C. 1866.)

(b) "Capacity building" or "development of model programs and products" means that projects develop model programs and products to be used by organizations, agencies, and individuals other than the award recipient and thereby have a substantial national impact in furthering the purpose of providing educational equity for women.

(1) The primary goal of projects is not provision of services or benefits to particular organizations, agencies, or individuals, although these services or benefits may occur as an indirect effect.

(2) The use of the word "national" with the development of model programs and products (or capacity building) does not mean that all school systems, or

all adult women, or all institutions of higher education in the Nation must be able to use the programs or products developed. Section 160f.3(d) explicitly authorizes projects which focus on one or more diverse population groups. "National" is used primarily to make a distinction from purely local projects. Examples of target populations for projects which would contribute to national capacity are: administrators of urban school systems, employers and counselors who work with adults entering the job market in rural areas, directors of women's centers, teachers at the elementary level, rural educators in the Southeast, State directors of vocational education, and curriculum specialists for bilingual projects in the Southwest.

(3) While a number of education programs use the term "capacity building" to refer to the use of Federal funds as seed money to build the capacity of a recipient institution to change or reform itself and thereby respond to national priorities, those kinds of programs are often characterized by limitation to only one or two types of applicants, for example, only local educational agencies or institutions of higher education, or by limitation to one level of education, such as postsecondary education. On the other hand, the Women's Educational Equity Act (WEEA) Program authorizes activities at all levels of education and permits all public agencies, nonprofit organizations, and individuals to compete for funds. Further, there are few models presently available to the thousands of institutions and agencies which are undertaking certain changes either because of the effect of Title IX or because of other factors, such as the desire of certain institutions to meet the needs of new kinds of students. The WEEA program, therefore, is building capacity at the national level to respond to needs throughout the country. The program emphasizes those aspects of program operations which can produce evidence of effectiveness so that the results can be disseminated for use in many institutions and agencies.

(4) Examples and an indication of whether they meet the program requirement may be useful. An application from a school system for the purpose of training its own administrators, teachers, and counselors to be aware of and to change differential treatment of students on the basis of sex would not meet the requirement for capacity building or development of model programs and products. An application to develop and test a program for training administrators, teachers, and counselors to be aware of and to change differential treatment of students on the basis of sex with plans for field testing in school systems and a plan for dissemination through school associations is an example of capacity building. The objective of the first is the training of several hundred administrators, teachers, and counselors to benefit a specific school system. The objective of the second is to develop and test a model program so that it can be made available to others who need it. In the

school systems where it is tested, the administrators, teachers, and counselors who participate in the validation would receive benefits as an indirect effect.

(5) A second example would be an application to establish a Women's Center to provide and coordinate activities affecting educational equity for women and to develop a more extensive program to meet the needs of adult students at a particular institution. Such an application does not meet the requirement for capacity building, since it is designed to serve a particular institution. Applications addressing aspects of the operations of women's centers which are being researched, developed, or analyzed for the use of many similar centers could meet the requirements of capacity building. One may use the test of how the need is expressed to determine whether the program's requirement would be met. For example, in the first, the institution needs a better women's center. The project would meet the institution's and its individual client's needs. In the second, there is a need to learn what structure, activities, or personnel in women's centers are most productive and cost-effective. The project meets the need to solve a problem affecting many institutions. Again, side benefits may occur within a project for the individuals involved.

(6) A third example is an application to provide funds for the special costs of an existing program to train and place 12 unemployed adult women. The measure of effectiveness would be the completed training and successful placement of the 12 persons. This would not be an effort to develop national capacity building.

(7) Scholarships and fellowships to serve the needs of an individual would not qualify, nor would the construction of facilities for athletics, for example, be permissible.

(20 U.S.C. 1866 (b), (d), and (e).)

(c) "Council" means the National Advisory Council on Women's Educational Programs established pursuant to subsection (f) of the Act.

(20 U.S.C. 1866 (c) and (f).)

(d) "Educational equity for women" means:

(1) The elimination of discrimination on the basis of sex and of those elements of sex role stereotyping and sex role socialization in educational institutions, programs, and curricula which prevent full and fair participation by women in educational programs and in American society generally; and

(2) The achievement of responsiveness of educational institutions, programs, curricula, policy makers, administrators, instructors, counselors, and other personnel to the special educational needs, interests, and concerns of women arising from inequitable educational policies and practices.

(3) Educational equity for women involves the elimination of stereotyping by sex, so that both men and women can choose freely among and benefit from opportunities in educational institutions and programs with limitations deter-

mined only by each individual's interests, aptitudes, and abilities. Educational equity for women does not imply the development of new stereotypes for men and women.

(e) "Elementary school" means a day or residential school which provides elementary education, as determined under State law, and "Elementary school level" means the educational level at which elementary education is provided, as determined under State law.

(f) "Local educational agency" or "LEA" means a public board of education or other public authority legally constituted within a State for either administrative control or direction of, or to perform a service function for, public elementary or secondary schools in a city, county, township, school district, or other political subdivision of a State or such combination of school districts or counties as are recognized in a State as an administrative agency for its public elementary or secondary schools. The term also includes any other public institution or agency having administrative control and direction of a public elementary or secondary school.

(g) "Man" or "men" may include, as appropriate, boys.

(h) "Nonprofit," as applied to a school, agency, organization, or institution means a school, agency, organization, or institution owned and operated by one or more nonprofit corporations or associations no part of the net earning of which inures, or may lawfully inure, to the benefit of any private shareholder or individual.

(i) "Public agency" means a legally constituted organization of government under public administrative control and direction, including Indian tribes which exercise municipal functions, but does not include agencies of the United States.

(j) "Secondary school" means a day or residential school which provides secondary education, as determined under State law, except that it does not include any education provided beyond grade 12, and "Secondary school level" means the educational level (not beyond grade 12) at which secondary education is provided as determined under State law.

(k) "Sex role socialization" refers to the differential processes and experiences used to prepare males and females for the roles that society defines as being appropriate for their sex.

(l) "Sex role stereotypes" involve assumptions that females or males, because they share a common gender, also share common abilities, interests, values, and/or roles.

(m) "Socialization" is the process by which children and adults are prepared to occupy various roles. It is achieved through the provision and accumulation of life experiences that transmit knowledge, attitudes, and skills to perform functions necessary for these roles. Socialization for young children is often deliberate and readily observable as children are being prepared to carry out a complex collection of economic, social, physical, political, and psychological

roles as adults. Much of adult socialization is subtle and unnoticed because it consists of continued reinforcement for already learned roles. In situations where the learning of new roles or skills is necessary, adult socialization may become extremely focused and explicit.

(n) "State educational agency" or "SEA" means the State board of education or other agency or officer primarily responsible for the State supervision of public elementary and secondary schools, or, if there is no such officer or agency, an officer or agency designated by the Governor or by State law.

(o) "Target population" means the persons for whose needs the project is designed, with whom the project is validated (tested) and among whom are found the future users of the model program or product.

(1) The target population may include both intermediate and ultimate beneficiaries or solely ultimate beneficiaries.

(2) For example, in a project designed to develop a retraining program for high school counselors in techniques and procedures for providing sex fair counseling for use by counselors across the country, the target population is high school counselors, the intermediate beneficiaries are high school students across the country. In the same type project designed for use by high school counselors of native American youth, the intermediate target population is still high school counselors but the ultimate target population is native American high school youth.

(3) Another example would be a program designed for adult women who desire to reenter the labor force or continue their education. The target population is adult women. Adult women are the population upon which the program is validated, and they are the ultimate beneficiaries. There may be no intermediate beneficiaries. If the project were designed for employers and counselors of adult women, the employers and counselors would be the intermediate beneficiaries and the adult women the ultimate beneficiaries.

(p) (see page 6a)

(q) "Woman" or "women" may include, as appropriate, girls.

(20 U.S.C. 1866.)

(r) "Validation" means testing or trying out materials and programs with persons similar to the users for whom they are designed. It is a process that takes place while a program or product is being developed. It has two purposes: to identify problems which should be corrected in subsequent versions and to assess effectiveness. The terms field-testing or pilot-testing are also sometimes used.

(1) Since the WEEA Program is supporting projects that are developing model programs and products to be widely used by others with similar needs, populations, level of education, and the like, the question to be answered by validation is: "How sure (certain) are we that programs and products are truly

doing what we said they would do (validity) and that they do what we say they do consistently (reliability)?"

(2) This is not easy to answer, and validation is a strenuous, exacting procedure or set of procedures planned from the inception of the project and involving such things as sample populations, pre-post tests, statistical analysis, control groups.

(3) The results of sound validation usually indicate under what circumstances and with whom the programs or products can be used and with what degree of certainty and consistency the same original results will be obtained.

§ 160f.3 Nature of projects to provide educational equity for women.

(a) *General.* (1) Educational equity for women, as used in this part, means:

(i) The elimination of discrimination on the basis of sex and of those elements of sex role stereotyping and sex role socialization in educational institutions, programs, and curricula which prevent full and fair participation by women in educational programs and in American society generally; and

(ii) The achievement of responsiveness of educational institutions, programs, curricula, policy makers, administrators, instructors, counselors, and other personnel to the special educational needs, interests, and concerns of women arising from inequitable educational policies and practices.

(2) Educational equity for women, as used in this part, involves the elimination of stereotyping by sex, so that both men and women can choose freely among and benefit from opportunities in educational institutions and programs with limitations determined only by each individual's interests, aptitudes, and abilities. Educational equity for women does not imply the development of new stereotypes for men and women.

(b) *Capacity building: development of model programs and products.* (1) (i) Projects supported under this part must contribute to capacity building in the area of educational equity for women, as defined in § 160f.2.

(ii) The primary goal of projects is not provision of services or benefits to particular organizations, agencies, or individuals, although these services or benefits may occur as an indirect effect.

(2) Projects supported under this part may not develop products which are so expensive to use or adopt that extensive dissemination will be inhibited.

(20 U.S.C. 1866 (b), (d), and (e).)

(c) *Approaches to educational equity for women.* Each project funded under this part must be designed to develop model programs, materials, or other products in order to promote educational equity for women in one or more of the following ways:

(1) *Focus on systemic change.* The elimination of those elements of sex role stereotyping and sex role socialization in educational institutions and agencies which separately and together limit over time the aspirations, experiences, and

options of women and men for full participation in American society;

(2) *Focus on institutional change.* Assistance in the process of eliminating discriminatory policies and practices in educational agencies, organizations, and programs which may be contrary to Federal statutes, executive orders, or regulations; or

(3) *Focus on supplementary activities for individuals.* The provision of special educational activities and support services designed to overcome limitations on the opportunities of women resulting from past or continuing discrimination, sex role stereotyping, or sex role socialization.

(20 U.S.C. 1866; Committee on Education and Labor, Hearing on H.R. 208, July 25, 1973, pp. 4-6; S. Rept. No. 763, 93rd Cong. 2d Sess. 78-79 (1974))

(d) *Diverse approaches to educational equity for women among various population groups.* (1) In recognition of the diverse approaches to the provision of educational equity for women among different groups, projects funded under this part may focus on approaches to educational equity for women relating to one or more population groups based on race, ethnic origin, age, socioeconomic status, or residence (e.g., rural, urban, Southwestern, Appalachian).

(2) If the proposed project does focus on an approach relating to one or more population group(s) above, the project application must:

(i) Identify the population group(s);

(ii) Show understanding and awareness of the goals, values, and priorities of the population group(s); and

(iii) Explain the applicability or limitations of the use of the programs or products with other population groups. The relevance of the project's materials, strategy, and goals to the cultural and other values of the population group(s) must be clearly demonstrated. Extensive research or data is not required in the project application.

(3) Projects under this paragraph are subject to the nondiscrimination provisions of § 160f.1(d).

(20 U.S.C. 1866.)

§ 160f.4 Types of projects.

(a) The Act authorizes the Commissioner to award grants and contracts for activities at all levels of education designed to carry out the purpose of providing educational equity for women, including the following activities related to educational equity:

(1) The development, evaluation, and dissemination of curricula, textbooks, and other educational materials;

(2) Preservice and inservice training for educational personnel, including guidance and counseling personnel;

(3) Research, development, and other educational activities;

(4) Guidance and counseling activities, including the development of tests which are nondiscriminatory on the basis of sex;

(5) Educational activities to increase opportunities for adult women, including continuing educational activities for

underemployed and unemployed women; and

(6) The expansion and improvement of educational programs and activities for women in vocational education, career education, physical education, and educational administration.

(20 U.S.C. 1866(d)(1).)

(b) In implementing the activities authorized by the Act and described in paragraph (a) of this section, the Commissioner will:

(1) Make awards for general grants, as described in § 160f.12.

(20 U.S.C. 1866(d).)

(2) Make small grants, not to exceed \$15,000 each, to support innovative approaches to the provision of educational equity for women, as described in § 160f.13; and

(20 U.S.C. 1866(e).)

(3) Solicit proposals for and make awards of procurement contracts in the program areas described in § 160f.14.

(20 U.S.C. 1866(d).)

§ 160f.5 Duration of projects.

(a) While grant applications may be filed proposing multi-year projects, it is expected that a substantial proportion of projects funded by the Commissioner in any fiscal year will have a project duration of only one year.

(b) Applications proposing multi-year projects must be accompanied by an explanation of the need for multi-year support, an overview of the objectives and activities proposed, and budget estimates to attain these objectives in any proposed subsequent year.

(c) If the application demonstrates to the Commissioner's satisfaction that multi-year support is needed to carry out the proposed project, the Commissioner may, in the initial notification of grant award for the project, indicate an intention to assist the project on an appropriate multi-year basis through continuation grants.

(d) Continuation awards may be made to projects described in paragraph (c) of this section, subject to the availability of funds and to the following provisions:

(1) Continuation applications will not be competitive with applications for new grant awards, but will be competitive with other applications for continuation awards;

(2) The program narrative of a continuation application must contain a detailed plan of operation (consistent with the general scope of work approved at the time of the original grant award), a management plan, and a detailed budget for the following fiscal year. Any changes in staff members, or their duties, in the validation procedures, the evaluation design, or approaches to dissemination must be explained. Requests for modifications in project objectives or the final results, programs, or products must be justified and the basis explained in detail; and

(3) Applications for continuation awards will be reviewed to determine:

(i) If the grantee has complied with the grant terms and conditions, the Act, and any applicable regulation;

(ii) The project's effectiveness to date, or the constructive changes proposed as a result of the ongoing evaluation;

(iii) The extent to which the project is meeting applicable priorities; and

(iv) The extent to which continuation of Federal assistance to the project is in the best interests of educational equity for women.

(20 U.S.C. 1221e-3(a)(1), 1866)

§ 160f.6 Eligible applicants.

The Commissioner may make grants to, or enter into contracts with, public agencies, private nonprofit organizations, or individuals to carry out projects under this part.

(20 U.S.C. 1866(d)(1) and (e))

§ 160f.7 Preapplications.

(a) *General.* (1) The Commissioner may invite prospective applicants for grants under this part in any given fiscal year to submit preapplications in accordance with § 100a.41 of this chapter by publishing a closing date for preapplications in the FEDERAL REGISTER. Either general or small grants, or both, may be included.

(2) (i) The preapplication process is used to avoid the investment of substantial time and effort by applicants in the preparation of applications for projects which might not be responsive to program policy and criteria and therefore have little chance of being funded. This process permits a preliminary review of shortened, simplified preapplications, with advice to applicants as to whether proposed projects are likely to have a chance for funding.

(ii) The preapplication process also may conserve limited resources of the Government by reducing the staff time and consultant funds required to process and review a large number of full applications. When the preapplication process is used, the Government can forecast the approximate number of applications which will be submitted and plan accordingly.

(3) When preapplications are invited, applicants are encouraged to use the process. Preapplications will be reviewed and those identified as having potential to compete will be invited to submit full applications. Applicants that are not invited may also submit full applications at their option. Also, any applicant may submit a full application by the published closing date for full applications without having previously submitted a preapplication. No application would be treated preferentially, and all would be reviewed against the published evaluation criteria.

(b) *State review of local educational agency (LEA) preapplications.* (1) A copy of a preapplication from a local educational agency must be submitted to the State educational agency of the State in which the local educational agency is

located, concurrently with the submission of the preapplication to the Commissioner, to provide the State educational agency an opportunity to review and comment on that preapplication. A copy of the transmittal letter to the State agency must be attached to the preapplication.

(2) The Commissioner may establish a cut-off date for submission of comments by State educational agencies on a local educational agency's preapplication. If the Commissioner establishes a cut-off date for submission of comments, failure by a State educational agency to submit comments to the Commissioner within the period specified by the Commissioner for a preapplication shall be deemed a waiver of the State educational agency's opportunity to comment on that preapplication.

(c) *Preapplication requirements.* (1) Preapplications under this part must include a program narrative statement as required by the preapplication forms provided for in § 100a.41 of this chapter. The narrative statement may not exceed three (3) to five (5) pages of readable size print plus attached short and relevant vitae. Lengthy appendices and exhibits will not be reviewed by the Commissioner.

(2) The preapplication must include the following information in the program narrative to permit its review according to the evaluation criteria in paragraph (d). If applicants omit some of the required information, the preapplications will be reviewed and points will be deducted where appropriate. The program narrative of a preapplication must:

(i) *Applicant qualifications.* (A) Include either names and duties of projected staff members or brief job descriptions and required qualifications for the director and other key personnel, as well as methods to be used in recruitment and hiring. Vitae may be attached to the program narrative; and

(B) Include a statement of applicant qualifications in the substantive area of the proposed project and its experience in and commitment to the area of women's educational equity;

(ii) *Need and impact.* (A) Provide a brief description of the project and its approach, the needs addressed, and specific results, programs, or products to be developed by the proposed project;

(B) Indicate the target population which will utilize the results of the project and the possible means for encouraging their use; and

(C) State briefly how the proposed project will contribute to the national capacity to respond to needs in educational equity for women through the development of model programs and/or products which are designed and tested to be disseminated nationwide;

(iii) *Plan.* (A) State the specific objectives of the proposed projects;

(B) Provide a brief statement on how the project will be managed; and

(C) If the applicant proposes a project with a duration in excess of one year, include in the program narrative

an explanation of the need for multi-year support, and budget forms must be completed for the first budget period of one year and for the balance of the proposed project.

(3) In the program narrative, applicants may explain any large items which have an impact on the total budget figure.

(d) *Preapplication evaluation criteria.* Preapplications for grants which meet the requirements in paragraph (c) (1) of this section will be evaluated on the basis of the following criteria and weighted according to the indicated points (maximum of 100 points):

(1) *Applicant qualifications.* (i) The extent to which the education and experience of the proposed project director and staff, or, where staff are not named, the job descriptions and required qualifications as well as methods for recruitment and hiring, are related to the programmatic focus of the proposed project (10 points);

(ii) The extent to which the information about the proposed project director and staff evidence knowledge and experience in the area of women's educational equity (10 points);

(iii) The extent to which the applicant has demonstrated experience in the programmatic focus of the proposed project (10 points); and

(iv) The extent to which the applicant has demonstrated experience in and commitment to women's educational equity as evidence in the preapplication (10 points);

(2) *Need and impact.* (i) The degree to which the project addresses a critical need in the area of educational equity for women (10 points);

(ii) The degree to which the project describes a promising approach to provide educational equity for women (10 points);

(iii) The potential quality of the results, programs, or products to be developed and the viability of the method for use by others (10 points); and

(iv) The degree to which the proposed project will contribute to the national capacity to respond to the needs in the area of women's educational equity through the development of model programs or products (10 points);

(3) *Plan of operation.* (i) The extent to which proposed project objectives are clearly stated and capable of being attained and evaluated (5 points); and

(ii) The extent to which the preapplicant's statement on project management indicates potential for quality control (5 points);

(4) *Budget.* The reasonableness of the proposed total budget figure in relation to the accomplishment of the objectives and the relative importance of the needs addressed (10 points).

(20 U.S.C. 1221e-3(a)(1), 1232c(b)(3), 1866(d)(2) and (e).)

§ 160f.8 Application, proposal, and project requirements.

(a) *Introduction.* A grant or a contract under this part will be awarded only upon a grant application (in ac-

cordance with § 100a.40 of this chapter) or a contract proposal submitted to the Commissioner.

(b) *General.* (1) Unsolicited applications or proposals will not be accepted under this part. Grant applications will be accepted for review only if they are filed in response to a notice of closing date published in the FEDERAL REGISTER in accordance with 45 CFR 100a.15 concerning application submissions to the Commissioner.

(2) Lengthy appendices or exhibits attached to applications or proposals will not be reviewed.

(c) *Application requirements.* The requirements set forth in this paragraph cover the information needed by the Commissioner to evaluate an application in accordance with the criteria in § 160f.10. The requirements correspond to the evaluation criteria, and applicants are encouraged, in preparing their applications, to follow this order to facilitate review of the application. An application for a grant under this part must:

(1) *Nature and purpose.* Provide information sufficient to satisfy the Commissioner that the proposed project holds promise of making a substantial contribution toward attaining educational equity for women and will comply with the provisions of § 160f.3;

(2) *Applicant qualifications.* Contain sufficient information about the applicant to enable the Commissioner to determine both its qualifications for receiving an award and its commitment to the provision of educational equity for women, including information about:

(i) The applicant's staffing pattern and experience in the area of educational equity for women, as well as in the programmatic focus of the proposed project;

(ii) The proposed project director and staff, including their education, training, awards, publications, and experience in the areas of educational equity for women and in the programmatic focus of the proposed project, and existing or planned commitments to other projects;

(iii) The extent to which the staff will be representative of the target population and, where applicable, the special population group(s);

(iv) Job descriptions and required qualifications as well as methods of recruitment and hiring, where staff members are not yet named;

(v) Commitment through in kind or direct financial contributions or procedures to use results of projects in ongoing activities of the applicant; and

(vi) Available facilities and other resources for the project;

(3) *Need and impact.* (i) Identify the need to be addressed by the proposed project and supply relevant documentation of the need;

(ii) Specify the nature of the program, product, or final results of the proposed project and the specific target population, as defined in § 160f.2.

(iii) Specify the population group(s), if any, to which the project is related (as described in § 160f.3(d)), demonstrate understanding of the goals, values, and priorities of the group(s), and explain the applicability or limitations on the

use of the project's results with other population group(s);

(iv) Document how the project will contribute to the development of model programs and products (capacity building) in the area of educational equity for women, including a description of likely users of the results, programs, and products of the projects, and rough projections of the cost to others of implementing or using the products; and

(v) Describe the procedures and plans for validation by the applicant and possible approaches and strategies for dissemination and utilization of the programs or products developed by the project. The description of validation procedures must set forth criteria consistent with § 160f.1(d) for the selection of participants in validation under the project, the types and numbers of persons expected to be involved, the location(s), time schedules, and specific expectations for the various activities in the validation procedures;

(4) *Plan of operation.* (i) State project objectives with specific outcomes for the project;

(ii) Provide a project evaluation design to measure the extent to which the objectives are accomplished by the project and which indicates the approach, the status of planning, methodology, extent of experience in the development and use of such designs and need for procuring outside expertise;

(iii) Provide a statement on management which describes the project's decision-making process and its rationale and include a management plan, which references objectives, operational activities, schedules, resources, products, and evaluation;

(iv) Describe a plan for cooperative development of the project with representative groups in the field of the project and in educational equity for women, such as practitioners (both at the policy and implementation levels), theoreticians, potential participants in the validation, and the community; and

(v) Include a detailed budget.

(5) *Relationship to other activities.* Reference is made in § 160f.3(d) to the diverse approaches to the achievement of women's educational equity among various racial, ethnic, socioeconomic, age, and residence groups. If the applicant is carrying out other activities concerned with issues of discrimination, counseling, stereotyping, socialization, or the cultural values and heritage of social, ethnic, regional, or socioeconomic groups, the application must explain the specific relationship of the proposed project to these other activities.

(20 U.S.C. 1866(d)(2).)

(d) *Small grants.* Applications for small grants under § 160f.13 are subject to the applicable requirements in this section, with appropriate consideration to the scope and amount of the proposed award.

(e) *State review of local educational agency (LEA) applications.* (1) The Commissioner will not approve an application submitted by a local educational agency for a grant under this part unless the

State educational agency of the State in which that local educational agency is located has been given an opportunity to review and comment on the application.

(2) A local educational agency must provide a copy of its application to the appropriate State educational agency concurrently with its submission to the Commissioner of the application, which must contain a copy of the transmittal letter to the State agency.

(3) The Commissioner may establish a cut-off date for submission of comments by State educational agencies on local educational agency applications. If the Commissioner establishes a cut-off date for submission of comments, failure by a State educational agency to submit comments to the Commissioner within the period specified by the Commissioner for an application shall be deemed a waiver of the State educational agency's opportunity to comment on that application.

(20 U.S.C. 1866(e).)

(f) *Dissemination of effective materials and programs.* Project awards under this part will be subject to the condition that materials and programs developed and validated under the project shall not be disseminated without review for effectiveness by the Commissioner. Therefore, each application for an award under this part must contain provisions for review of materials and programs, prior to dissemination in accordance with the requirement of this paragraph.

(g) *Evaluation.* Project awards under this part will be subject to the condition that the award recipient collect and make available information required by the Commissioner or by the Council, in accordance with the time constraints the Commissioner or Council may designate for purposes of carrying out program evaluation, including that provided for under subsection (f) of the Act.

(h) *Nondiscrimination.* Project awards under this part will be subject to the condition that the grantee or contractor reflect the nondiscrimination provisions set forth in subparagraphs (1) and (2) of § 160f.1(d) in any public announcements about the project relating to employment and participation by persons in the project activities.

(20 U.S.C. 1866.)

§ 160f.9 Award decisions.

Decisions on whether or not to make awards under this part will be made by the Commissioner based upon:

(a) With respect to contracts;

(1) The specific evaluation criteria included in each Request for Proposal (RFP) solicitation; and

(2) The procedures for selection required by the regulations for Procurement Contracts, 41 CFR Chapters 1 and 3 and by Departmental or agency policy.

(b) With respect to grants:

(1) Applicable criteria set forth in § 160f.10;

(2) The need to support projects which collectively address all levels of education; and

(3) The need to support:

(i) A variety of projects which collectively represent to the extent possible the diversity of needs and concerns in educational equity for women;

(ii) A variety of strategies for addressing needs;

(iii) A variety of delivery systems, such as community organizations, public agencies, and private nonprofit organizations, as well as traditional educational institutions; and

(iv) Demographic diversity.

(20 U.S.C. 1866 (b), (d), (e), (f) (3).)

§ 160f.10 General evaluation criteria for grants.

(a) *General criteria.* Applications for grants which meet the requirements in § 160f.8 will be evaluated on the basis of the following criteria, weighted according to the indicated points (maximum of 220 points):

(1) *Applicant qualifications.* (65 points)

(i) The extent and quality of the applicant's relevant experience in the area of educational equity for women as evidenced in the application (10 points);

(ii) The extent and quality of the applicant's relevant experience in the programmatic focus of the project (10 points);

(iii) The extent to which the staffing pattern of the project and of the applicant agency or organization as summarized in the application reflects evidence of commitment to equity for women, including women from minority groups (15 points);

(iv) The extent to which the qualifications of the project director and staff include demonstrated relevant experience of high quality in the area of educational equity for women (10 points);

(v) The extent to which the qualifications of the project director and staff include demonstrated relevant experience of high quality in the programmatic focus of the project as evidenced in the application (10 points); and

(vi) The extent to which the applicant has the capability to conduct the proposed project, including necessary facilities and resources as evidenced in the application (10 points);

(2) *Need and impact.* (65 points)

(i) The degree to which the proposed project is likely to make a substantial qualitative contribution toward attaining the provision of educational equity for women, and to this end:

(A) Clearly identifies a critical need to be addressed (10 points); and

(B) Specifies the substantive nature of the program, product, or final results which have potential for use as a model throughout the Nation or throughout population groups based on race, ethnic origin, age, socioeconomic status, or residence (10 points);

(ii) The degree to which the applicant, where applicable, shows understanding of the goals, values, and priorities of special population group(s), as described in § 160f.3(d), and the degree to which the application demonstrates an appropriate understanding of the applicability or

limitations of the use of the results or products of the project with other populations (15 points);

(iii) The extent to which the intended results of the proposed project can be used by others and thus the extent to which the application specifies:

(A) Well-designed validation procedures (10 points); and

(B) Approaches for dissemination and utilization of the intended results (10 points); and

(iv) The extent to which the applicant demonstrates commitment through in-kind or direct financial contributions or through procedures to use all or parts of the program or products developed under the grant in the continuing activities of the applicant (10 points);

(3) *Plan of operation* (70 points). (i) The extent to which the application sharply defines and clearly states objectives for the proposed project which are capable of being achieved by the proposed procedures and capable of being assessed upon attainment (15 points);

(ii) The extent to which the application ensures adequate evaluation of the activities through the description of a project evaluation design which would measure the extent to which the objectives have been accomplished by the project and would describe an eventual evaluation report containing sufficient data, information, and direction to permit and encourage replication (15 points);

(iii) The quality of the statement on management that describes the project's decision-making process and its rationale and the quality of the management plan which references objectives, operational activities, schedules (including the amount of time to be spent on the project by the proposed staff members), resources, products, and the project evaluation design (15 points);

(iv) The extent to which the program to be developed under the project will be developed in cooperation with representative groups in the field of the project and of educational equity for women, such as practitioners (both at the policy and implementation levels), theoreticians, potential participants in the validation, and the community (15 points); and

(v) The extent to which the application presents a budget that is reasonable in relation to anticipated results and reflects the management design (10 points).

(4) *Geographical distribution of awards.* (20 points) The extent to which approval of an application will contribute to an appropriate geographical distribution of project awards throughout the Nation. The Commissioner will apply this criterion to individual applications after taking into account relevant recommendations of the Council.

(b) *General provisions criteria.* Evaluation criteria set forth in § 160a.26(b) of this chapter will not apply to applications or proposals submitted under this part.

(c) *Small grants.* Applications for small grants will be evaluated in accord-

ance with the criteria specified in paragraph (a) of this section with appropriate consideration given to the scope and amount of the proposed award.

(20 U.S.C. 1866 (d) and (e).)

§ 160f.11 [Reserved]

§ 160f.12 General grant awards.

(a) *General.* In awarding new grants under this part (except with respect to small grants described in § 160f.13), the Commissioner may establish priorities by publishing them in an Appendix to this regulation. Whether or not there are priorities, applicants may propose projects in any area authorized by the Act. Applicants may find guidance by examining the six activities which are listed in the Act and quoted in § 160f.4(a).

(b) *Number and size of general grant awards.* (1) Contingent upon the availability of funds, it is expected that 30 to 50 new general grants will be awarded per fiscal year.

(2) It is anticipated that the size of general grant awards will range from about \$35,000 to \$175,000, depending on the scope of the proposed project. Nothing in this paragraph shall be construed as a limitation on the amount of funds which may be available to a particular grantee.

(20 U.S.C. 1866(d).)

§ 160f.13 Small grant awards.

(a) Grants under this section will support the development and implementation of innovative approaches to the attainment of equity in education for women. The innovative approaches need not be original but may include practices that:

- (1) Are similar to present practices but are not widely known or used;
- (2) Expand on present practices; or
- (3) Are new to a specific target population.

(b) Applications for grants under this section may focus on any of the six programmatic areas outlined in § 160f.4(a) or other areas of need in the provision of educational equity for women.

(c) Projects supported under this section must be designed to contribute to the development of model programs and products (capacity building) in the area of educational equity for women as provided in § 160f.3(b), with appropriate consideration to the scope and amount of the grant award. The Commissioner may also use the small grant program for further testing of programs and products developed and validated by previous projects supported under this part when they become available.

(d) Contingent upon the availability of funds, it is expected that 20 to 30 grants will be made under this section per fiscal year for amounts not to exceed \$15,000.

(20 U.S.C. 1866(e).)

§ 160f.14 Contract activities.

(a) *General.* Contingent upon the availability of funds, contracts will be awarded on the basis of separate solicitations setting forth appropriate specifica-

tions in the areas described in paragraph (b) of this section.

(b) *Funding areas.* It is expected that contracts will be awarded in the following areas:

(1) Technical assistance for Title IX of the Education Amendments of 1972 (Pub. L. 92-318);

(2) Operation of a communications network in the field of educational equity for women;

(3) Dissemination of tested programs and products developed under the Act to organizations and agencies which wish to use or adapt them; and

(4) Those other areas of women's educational equity where the Commissioner determines that specific procurements would further the purpose of the Act.

(20 U.S.C. 1866(d) (1).)

§ 160f.15 Allowable costs.

(a) *General.* (1) Allowable costs under projects to which funds are awarded pursuant to this part shall be determined in accordance with cost principles set forth in:

(i) Appendix B of subchapter A of this chapter with respect to grants to public agencies;

(ii) Appendix C of subchapter A of this chapter with respect to grants to nonprofit educational institutions;

(iii) Appendix D of subchapter A of this chapter with respect to grants to other nonprofit institutions and individuals; and

(iv) 41 CFR Part 1-15 with respect to contracts.

(2) The costs of nonexpendable personal property with an acquisition cost of \$1,000 or more per unit, depreciation or use allowances, automatic data processing, memberships, subscriptions, and professional activities will be allowable if they have been specifically authorized by the Commissioner in the notification of grant award.

(3) Facilities, capital assets, and repairs which materially increase the value or useful life of capital assets generally shall be unallowable under this part, and will be allowed only where specially justified by the applicant and specifically authorized by the Commissioner.

(4) Funds supplied under grants awarded under this paragraph usually will not be available to pay the general costs of overall education, training, or career employment preparation programs. Rather, funds will be available for payment of the incremental costs such as the costs necessary for effective planning, development, evaluation, testing, validation, and in some cases, dissemination, directly related to educational equity for women.

(b) *Long-term training projects.* (1) Grants for training projects designed to provide individual participants with full-time post-baccalaureate training with a duration of at least one academic year may include provision for the payment to:

- (i) Grantees of tuition and fees; and
- (ii) Participants of stipends, dependency allowances, and other costs, includ-

ing child care, as the Commissioner may determine to be consistent with prevailing practices under comparable Federal programs.

(2) Provision for payments described in subparagraph (1) of this paragraph will be included in grant award documents at the discretion of the Commissioner, and only when the applicant requests these payments and provides sufficient information and justification in the application to satisfy the Commissioner that the payments would contribute substantially to the realization of the project objective to develop, test, and prepare for dissemination a successful model training program.

(3) If provisions for the payment of tuition and fees are included in a grant pursuant to this paragraph, the grantee may not charge participants in the training program for tuition and fees.

(c) *Payments for participation in validation of materials and programs.* (1) Projects may include in the grant or contract a provision for payments to non-educational participants (including parents, students, and others) and to educational personnel participants (including administrators, counselors, teachers, and others), whose participation is necessary for the validation of the programs or products developed by the project and who are not otherwise compensated for their time while participating.

(2) (i) Payments to non-educational participants may be made at rates not lower than the current Federal minimum wage rate nor higher than the rate set forth for educational personnel in subdivision (ii) of this subparagraph.

(ii) Except as provided under subdivision (iii) of this subparagraph, payments to educational personnel under this paragraph would be at the rate of \$30 for each full day of participation up to \$150 a week. For partial days involving less than 5 hours of attendance, the payments for this attendance would be at the rate of \$6 per hour, subject to the weekly limit of \$150.

(iii) Where participating educational personnel are ordinarily paid for their work at a salary scale determined by a collective bargaining agreement in which the minimum hourly rate for any individual is more than \$6 per hour, the individual would be compensated at the minimum hourly rate provided for under the collective bargaining agreement.

(3) Where a local educational agency or other educational agency or institution compensates teachers or other educational personnel whom it employs for their time in receiving training or participating in other activities under this paragraph and must also hire a substitute for the participant during the time of that participation, reimbursement may be made under the grant or contract which includes the component to the local educational agency or other educational agency or institution for the costs of hiring the substitute.

(4) No travel or dependency allowances will be paid for participation in any component under this paragraph.

(5) Participants in any short-term training may receive payments at the same rates as set forth in subparagraph (2) of this paragraph.

(6) Provision for payments described in this paragraph will be included in grant award documents or contracts at the discretion of the Commissioner, and only when the applicant requests these payments and justifies that the payments to the specific classes or groups of recipients to participate in the validation or training are necessary to carry out the program objective.

(d) *Indirect costs.* (1) Except as provided in subparagraphs (2) and (3) of this paragraph, indirect costs will be allowed under projects funded under this part in accordance with the applicable indirect cost rate allowances set out in Appendices B through D of subchapter A of this chapter.

(2) Indirect costs for training grants will be allowed at the lesser of:

(i) The level of indirect costs determined under subparagraph (1) of this paragraph; or

(ii) In grants where the Commissioner approves payments for stipends and dependency allowances under paragraph (b) (1) (ii) of this section, eight percent of the total direct costs, including stipends and dependency allowances.

(3) Indirect costs shall not be allowed under grants to individuals under this part.

(20 U.S.C. 1231c(b), 1232c(b)(2).)

[FR Doc. 77-18449 Filed 6-27-77; 8:45 am]

Title 24—Housing and Urban Development
CHAPTER V—OFFICE OF THE ASSISTANT
SECRETARY FOR COMMUNITY PLAN-
NING AND DEVELOPMENT, DEPART-
MENT OF HOUSING AND URBAN DE-
VELOPMENT

[Docket No. R-77-292]

PART 570—COMMUNITY DEVELOPMENT
BLOCK GRANTS

Grant Administration, and Other Program
Requirements

AGENCY: Department of Housing and Urban Development.

ACTION: Final rule.

SUMMARY: This final rule amends Department regulations to add new material regarding the closeout of discretionary grants and the Lead-Based Paint Poisoning Prevention Act, delete material specifically designed for Fiscal Year 1975, correct certain technical errors, and provide greater detail and clarity in accordance with our experience with the program.

EFFECTIVE DATE: June 28, 1977.

FOR FURTHER INFORMATION CON-
TACT:

David J. Pollack, Financial Analyst, Office of Community Development Programs, HUD/Community Planning and Development, Room 7178, 451 7th Street, SW., Washington, D.C. 20410. 202-755-6330.

SUPPLEMENTARY INFORMATION: On November 30, 1976, the Department of Housing and Urban Development published a proposed rule (41 FR 52626) to amend Subparts F and G of 24 CFR Part 570. Interested persons were given until December 30, 1976, to submit written comments. All comments with respect to the proposed rulemaking were given due consideration. As a result of the comments received, the following changes were made:

1. In response to several comments, the language in § 570.503(b) has been revised to make it more precise and to indicate that to the maximum extent practicable program income shall be disbursed for approved community development activities prior to making additional draws from the letter of credit.

2. Included in the proposed rulemaking was § 570.503(c) concerning the timing and amount of cash disbursements for rehabilitation loan and grant activities. Because additional time is needed to evaluate all of the factors involved, a final rule on this subject is not being adopted at this time.

3. The language of § 570.506(c) has been modified to indicate that receipts derived from the operation of a public work or facility constructed with block grant funds do not constitute program income, regardless of the use to which such receipts will be put. This section has been further modified to provide that proceeds received from special assessments levied to recover the cost of constructing a public work or facility, do constitute program income to the extent

such cost was initially paid with block grant funds. Additionally, the reference to the provisions of §§ 570.305 and 570.402(f) has been deleted as unnecessary.

4. A new paragraph (j) has been added to § 570.512 to cover the situation in which both the recipient and HUD agree to terminate all or part of a discretionary grant because continuation of the program is unfeasible or would not produce beneficial results.

5. Several comments requested a clarification of whether § 570.606, regarding compliance with design standards for making buildings accessible and usable for the physically handicapped, applies to private buildings and facilities as well as public buildings and facilities. Accordingly, § 570.606 has been modified to indicate that the design standards apply to every building and facility (other than privately owned residential structures) designed, constructed, or altered with funds made available under this part, subject to the exceptions contained in 41 CFR Subpart 101-19.604.

The Secretary has determined that good cause exists for making this rule effective on June 28, 1977, since the new material contained in the rule regarding discretionary grant closeouts is urgently needed in order to close out projects in which all activities have been completed.

In connection with the environmental review of these amendments to the regulations, a Finding of Inapplicability has been made under HUD Handbook 1390.1, 38 FR 19182. A copy of the Finding is available for inspection in the Office of the Rules Docket Clerk, Room 5218, Department of Housing and Urban Development, 451 7th Street, SW., Washington, D.C. 20410.

NOTE:—It is hereby certified that the economic and inflationary impacts of these amendments have been carefully evaluated in accordance with OMB Circular A-107, Executive Order 11821.

Accordingly, 24 CFR Part 570 is amended as follows:

1. Section 570.503 is revised to read as follows:

§ 570.503 Cash withdrawals.

(a) The timing and amount of cash withdrawals from the U.S. Treasury by the recipient for activities which are free from all conditions specified pursuant to §§ 570.306(e) or 570.402(d) (5) (iii) shall be in accordance with U.S. Department of the Treasury regulations on withdrawal of cash from the Treasury for advances under Federal programs (31 CFR Part 205), as incorporated in HUD Handbook 1900.23 REV, Letter of Credit Procedures-Treasury Regional Disbursing Office System.

(b) To the maximum extent practicable, program income shall be disbursed prior to making additional draws from the letter of credit to finance approved community development activities (including local option activities) as follows:

(1) Program income in the form of repayments to a revolving fund, established to carry out an approved activity, shall be substantially disbursed from such

fund before additional draws are made from the letter of credit for the same activity.

(2) All other program income shall be substantially disbursed for any approved activity before additional draws are made from the letter of credit.

2. Section 570.504 is revised to read as follows:

§ 570.504 Restrictions on Fund Commitment and Expenditure.

When the letter of credit method of payment is used, a recipient's letter of credit will normally be issued (or amended if previously issued) in the full amount of all grant funds approved in the grant agreement, except for amounts deducted pursuant to § 570.802, amounts reserved and withheld pursuant to § 570.702, and amounts voluntarily budgeted by the recipient for repayment of urban renewal loans. However, the obligation or utilization of funds shall be subject to any restriction imposed as a result of conditional approvals pursuant to § 570.306(e) for entitlement grants or § 570.402(d) (5) (iii) for discretionary grants.

3. Section 570.506 is amended by revising paragraph (c) and by adding a new paragraph (e) as follows:

§ 570.506 Program income.

(c) All other program income earned during any period under which the recipient is assisted under this Part shall be retained by the recipient and used, in accordance with the provisions for cash withdrawals under § 570.503(b), for activities with respect to which the unconditional obligation and utilization of funds made available under this Part have been approved. Included in the category of other program income are proceeds from the disposition of real property, payments of principal and interest on rehabilitation loans, interest earned on revolving funds, and proceeds from special assessments levied to recover the cost of constructing a public work or facility to the extent such cost was initially paid with funds provided under this part. Receipts derived from the operation of a public work or facility, the construction of which was assisted under this part (e.g., admission fees paid by persons using recreational facilities constructed with grant funds; service fees paid by households using a water facility constructed with grant funds), do not constitute program income.

(e) The disposition of program income received subsequent to the closeout of a grant shall be governed by the provisions of § 570.512(c).

4. Section 570.509 is amended by revising paragraph (b) to read as follows:

§ 570.509 Audit.

(b) The recipient financial management systems shall provide for audits to be made by the recipient or at his direc-

tion, in accordance with audit guidelines prescribed by HUD. The recipient will schedule such audits with reasonable frequency, usually annually, but not less frequently than once every two years. In accordance with § 570.512(g), HUD may determine that a final audit of the recipient's discretionary grant program is not required. Audit reports shall be used in conjunction with the performance review procedures of § 570.909. Payment for the audit may be made from community development block grant funds but the responsibility for such payment rests with the recipient.

5. Section 570.510 is amended by adding a new paragraph (d) as follows:

§ 570.510 Retention of records.

(d) Records pertaining to each real property acquisition shall be retained for three years after settlement of the acquisition, or until disposition of the applicable relocation records in accordance with paragraph (c) of this section, whichever is later.

6. Section 570.512 is revised to read as follows:

§ 570.512 Discretionary grant closeouts.

(a) *Applicability.* The policies and procedures contained herein apply to the closeout of discretionary grants made pursuant to Subpart E of this part, including general purpose funds for metropolitan and nonmetropolitan areas, urgent needs funds and Secretary's discretionary funds.

(b) *Initiation of closeout.* HUD will advise the recipient to initiate closeout procedures when HUD determines, in consultation with the recipient, that there are no impediments to closeout and that the following criteria have been met or will be shortly:

(1) All costs to be paid with discretionary grant funds have been incurred, with the exception of (i) closeout costs such as payment for the final audit; and (ii) any unsettled third-party claims against the recipient. Costs are incurred when goods and services are received and contract work is performed. With respect to activities (such as rehabilitation of privately owned properties) which are carried out by means of revolving loan accounts, loan guarantee accounts, or similar mechanisms, costs shall be considered as incurred at the time funds for such activities are drawn from the recipient's letter of credit and initially used for the purposes described in the approved Community Development Program.

(2) With the exception of new communities and innovative project grants, the recipient has submitted a grantee performance report. If a performance report was previously submitted with a subsequent discretionary grant application, as required by § 570.400(h), it shall be updated and resubmitted upon completion of the activities carried out with the discretionary grant.

(3) Other responsibilities of the recipient under the grant agreement, applica-

ble law and regulations appear to have been carried out satisfactorily, or there is no further Federal interest in keeping the grant agreement open for the purpose of securing performance, such as a good faith effort by the recipient to achieve its housing assistance plan goals for the grant period. A final review of the recipient's compliance with the grant agreement, applicable law and regulations will be made during the final audit or HUD review in lieu of final audit pursuant to § 570.512(g).

(c) *Program income.* Subject to the requirements of paragraphs (d) and (e) of this section, program income received subsequent to grant closeout may be treated by the recipient as miscellaneous revenue, the use of which is not governed by the provisions of this part: *Provided,* The recipient has no other discretionary or entitlement grant program under this part which is active at the time the first grant is closed out. If the recipient has another such grant program, the program income received subsequent to the discretionary grant closeout shall be treated as program income of the active grant program.

(d) *Disposition of tangible personal property.* The recipient shall account for any tangible personal property acquired with grant funds in accordance with Attachment N of Federal Management Circular 74-7, "Property Management Standards."

(e) *Disposition of real property.* Proceeds derived after the discretionary grant closeout from the disposition of real property acquired with grant funds shall be subject to the program income requirements of paragraph (c) of this section: *Provided,* That where such income may be treated as miscellaneous revenue pursuant to paragraph (c), it shall be used by the recipient for community development activities eligible under § 570.200 to further the general purposes and objectives of the Act. The use of income subject to this proviso is not governed by any other requirements of this Part.

(f) *Status of housing assistance plan after closeout.* After closeout of a discretionary grant requiring a housing assistance plan, the housing assistance plan will remain in effect until one of the following occurs:

(1) The recipient submits, and HUD approves, a revised housing assistance plan.

(2) Another unit of general local government with overlapping jurisdiction over the same territory (e.g., an urban county, a county discretionary applicant, or any other such applicant) submits, and HUD approves, a housing assistance plan covering the territory of the original housing assistance plan.

(3) Three years elapse since the date of approval of the current housing assistance plan.

(g) *Audit.* Upon notification from HUD to initiate closeout procedures, the recipient shall arrange for a final audit to be made of its grant accounts and records in accordance with HUD Handbook IG 6505.2, "Audit Guide and Stand-

ards for Community Development Block Grant Recipients," § 570.509, and any other audit requirements of HUD hereafter in effect. HUD may determine that, due to the nature of the recipient's program or the relatively small amount of funds which have not been audited, a final audit is not required. In such instances, HUD will notify the recipient that HUD will perform necessary reviews of documentation and activities to determine that claimed costs are valid program expenses and that the recipient has met its other responsibilities under the grant agreement.

(h) *Certificate of completion and final cost.* Upon resolution of any findings of the final audit, or if the final audit is waived, after HUD has performed the review of documentation described in paragraph (g) of this section, the recipient shall prepare a certificate of completion and final cost, in a form prescribed by HUD, and submit it to the appropriate HUD Office.

(i) *Refund of excess grant funds.* Recipient shall refund to HUD any cash advanced in excess of the final grant amount, as shown on the certificate of completion approved by HUD.

(j) *Termination of grant for mutual convenience.* Grant assistance provided under this part may be cancelled, in whole or in part, by HUD or the recipient, prior to the completion of the approved community development program, when both parties agree that the continuation of the program is unfeasible or would not produce beneficial results commensurate with the further expenditure of funds. HUD shall determine whether an environmental review of the cancellation is required, and if such review is required, shall perform it pursuant to HUD Handbook 1390.1 and/or specific guidelines issued by the Secretary. The two parties shall agree upon the termination conditions, including the effective date and, in the case of partial terminations, the portion to be terminated. The recipient shall not incur new obligations for the terminated portion after the effective date, and shall cancel as many outstanding obligations as possible. HUD shall allow full credit to the recipient for the noncancelable obligations properly incurred by the recipient in carrying out the program prior to termination. The closeout policies and procedures contained in this section shall apply in all such cases except where the total grant is cancelled in its entirety, in which event only the provisions of § 570.512 (h) and (i) shall apply.

§ 570.602 [Amended]

7. Section 570.602 is amended by revising paragraph (d) to read as follows:

(d) The recipient may provide relocation payments and assistance in connection with displacement resulting from activities assisted under this Part which are not subject to § 570.602(a). The recipient may also provide relocation payments and assistance at levels above those established under the Uniform Act in connection with any displacement

resulting from activities assisted under this part. Unless such payments and assistance are made pursuant to State or local law, the recipient shall adopt a written policy available to the public setting forth the relocation payments and assistance it elects to provide and providing for equal payments and assistance within each class of displaced persons.

8. Section 570.606 is revised to read as follows:

§ 570.606 Architectural Barriers Act of 1968.

Every building or facility (other than a privately owned residential structure) designed, constructed, or altered with funds made available under this part, shall comply with the requirements of the "American Standard Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped," Number A-117.1-R 1971, subject to the exceptions contained in 41 CFR Subpart 101-19.604, issued pursuant to the Architectural Barriers Act of 1968, 42 U.S.C. 4151.

9. Section 570.607 is revised to read as follows:

§ 570.607 Activities for which other Federal funds must be sought.

A recipient may use community development funds for the provision of public services as described in § 570.200(a) (8) for activities (other than those previously approved under the model cities program and described in § 570.200(b));

or for flood or drainage facilities as described in § 570.200(a) (2): *Provided, That:*

(a) An application or written inquiry has been made to the Federal agency or agencies, if any, which conduct a program or programs most likely to meet the needs for which community development funds are being considered, or of the State or local agency or agencies, if any, which customarily receive funds from such programs and administer them within the recipient's jurisdiction.

(b) One of the following responses has been received: (1) A written statement of rejection from such Federal, State or local agency, if any; (2) a written statement that funds cannot be made available for at least 90 days after the request; or (3) no written response from the Federal, State or local agency, if any, within a 45-day period from the date of application or inquiry which states that funds can be made available within 90 days from the date of the response.

(c) The recipient has notified HUD of the results of the application or inquiry and has received authorization from HUD to incur costs for such activities.

10. Section 570.610 is amended as follows:

§ 570.610 Clean Air Act and Federal Water Pollution Control Act.

The recipient must comply with the provisions of the Clean Air Act, as amended (42 U.S.C. 1857 et seq.), and

the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.), and the regulations thereunder (40 CFR Part 15 and 40 CFR Part 61).

11. Section 570.611 is added to read as follows:

§ 570.611 Lead-Based Paint Poisoning Prevention Act.

The recipient must comply with the Department's Lead-Based Paint Regulations (24 CFR Part 35) issued pursuant to the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4831 et seq.) requiring prohibition of the use of lead-based paint, whenever assistance under this Part is used directly or indirectly by the recipient for construction, rehabilitation, or modernization of residential structures; elimination of immediate lead-based paint hazards in residential structures assisted under this part; and notification of the hazards of lead-based paint poisoning to purchasers and tenants of residential structures constructed prior to 1950 and assisted under this part.

(Title I of the Housing and Community Development Act of 1974 (42 U.S.C. 5301 et seq.), and sec. 7(d), Department of Housing and Urban Development Act (42 U.S.C. 2535 (d).)

Issued at Washington, D.C., June 20, 1977.

ROBERT C. EMBRY, Jr.,
Assistant Secretary for
Community Planning and Development.
(FR Doc. 77-18526 Filed 6-27-77; 8:45 am)